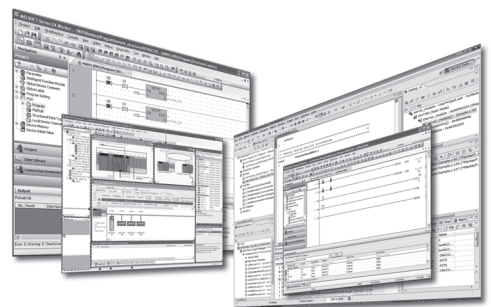


MELSOFT

Engineering Software

GX Works3 Operating Manual

-SW1DND-GXW3-E



SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual carefully and pay full attention to safety to handle the product correctly. If products are used in a different way from that specified by manufacturers, the protection function of the products may not work properly.

The precautions given in this manual are concerned with this product only. For the safety precautions for the programmable controller system, refer to the user's manual for the module used and MELSEC iQ-R Module Configuration Manual.

In this manual, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".



WARNING

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]



WARNING

- When data change, program change, or status control are performed from a personal computer to a running CPU module, configure an interlock circuit external to the programmable controller to ensure that the whole system always operates safely.

Furthermore, for the online operations performed from a personal computer to a CPU module, the corrective actions against a communication error due to such as a cable connection fault should be predetermined as a system.

- For the considerations specific to an safety CPU, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Startup)

📖 MELSEC iQ-R CPU Module User's Manual (Application)

[Security Precautions]



WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.
-


[Startup and Maintenance Precautions]

CAUTION

- For online operations performed from a personal computer to a running CPU module (program change while a CPU module is in RUN, operating status changes such as RUN-STOP switching, and remote control operation), read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
- When changing a program while a CPU module is in RUN (online program change), it may cause a program corruption in some operating conditions. Fully understand the precautions before use.
- The positioning test functions such as OPR, JOG, inching, or testing positioning data for positioning module must be executed with the CPU module set to STOP after the manual has been carefully read and the safety has been ensured.

Specially when executing the function on the network system, ensure the safety thoroughly since the machinery whose operation cannot be checked by an operator may be activated. The operation failure may cause the injury or machine damage.

- For the considerations specific to an safety CPU, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Startup)

 MELSEC iQ-R CPU Module User's Manual (Application)

CONDITIONS OF USE FOR THE PRODUCT

- (1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;
- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries. MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
- ("Prohibited Application")
- Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
 - Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
 - Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.
- Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi Electric representative in your region.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing the engineering software, MELSOFT series.

This manual describes the programming and functions required when using GX Works3.

Before using this product, please read this manual carefully, and develop familiarity with the functions and performance of GX Works3 to handle the product correctly.

Note that the menu names and operating procedures may differ depending on an operating system in use and its version.

When reading this manual, replace the names and procedures with the applicable ones as necessary.

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RELEVANT MANUALS

The following manuals are relevant to this product.

| Manual name [manual number] | Description |
|--|---|
| GX Works3 Operating Manual [SH-081215ENG] (this manual) | System configurations, parameter settings, and operation methods for the online function in GX Works3 |

TERMS

Unless otherwise specified, this manual uses the following terms.

| Term | Description |
|---------------------------------|--|
| Buffer memory | Memory in an intelligent function module to store data such as setting values and monitor values. For CPU modules, it refers to memory to store data such as setting values and monitor values of the Ethernet function, or data used for data communication of the multiple CPU system function. |
| Control CPU | A CPU module that controls connected I/O modules and intelligent function modules. In a multiple CPU system, a control CPU can be set for each module. |
| Cyclic transmission | A function by which data are periodically exchanged among stations on the same network using link devices. |
| Ethernet port direct connection | A direct connection between a programmable controller and personal computer without using a hub. |
| Execution program | A converted program that can be executed in a CPU module. |
| FB instance | A label created based on the definition of a function block. |
| Intelligent function module | A module that has functions other than an input or output, such as an A/D converter module and D/A converter module. |
| iQSS | iQ Sensor Solution. Cooperation of sensors, programmable controllers, HMI (Human Machine Interface), and engineering tool to facilitate the start-up or maintenance of sensors. |
| MELSOFT Library | A generic term for components (FB library, sample programs, drawing data) which provide easy operation of programmable controller related modules, GOTs, and other devices that are connected to the modules and GOTs. To obtain components of MELSOFT Library, please contact your local Mitsubishi Electric sales office or representative. |
| Multiple CPU system | A system where two to four CPU modules separately control I/O modules and intelligent function modules. |
| Single CPU system | A system where a single CPU module controls I/O modules and intelligent function modules. |
| Transient transmission | A function of communication with another station, which is used when requested by a dedicated instruction or a programming tool. |

For the terms of data, refer to the following:

 Page 102 Data configuration

For a process control system


| Term | Description |
|------------------------------------|--|
| Assignment information data | Assignment information on the tag data assigned to a file register. Device information of a CPU module is stored. |
| Faceplate | Gauge window on which an indicator such as a controller is displayed in image format. Monitoring the tag data and changing the current value can be performed. |
| FB property | A label of 'VAR_PUBLIC' class or 'VAR_PUBLIC_RETAIN' class in a local label defined in an FB. For a tag FB, the member of tag data is included in the member of tag FB. Operation of a function block can be changed by setting the initial value of an FB property, or changing the current value of an FB property while running a program. |
| FBD/LD program for process control | An FBD/LD program with the extended function for the process control. |
| Process control extension | Extending the functions of GX Works3 for the instrumentation engineering. |
| Process control function block | In the engineering tool project of the Process CPU and the SIL2 Process CPU, the function block supplied by the manufacturer that can be used in the FBD/LD program with the process control extension enabled. The process control instruction corresponding to the Process CPU and the SIL2 Process CPU is executed in the function block. |
| Tag access FB | A usable process control function block in a user-defined tag FB. The processing is executed by accessing tag data of a user-defined tag FB. |
| Tag data | Data in which a process condition and process status in a tag FB are defined as a structure. |
| Tag FB | A function block to work as a device such as a controller and indicator for process control. The processing is executed by accessing tag data defined as a global label. |
| Tag type | Classification of process control functions such as a controller and indicator. The tag type defines the types of a data tag structure and faceplate. |

| Term | Description |
|---------------------|--|
| User-defined tag FB | A function block to customize the process control processing of a manufacturer-defined tag FB. Tag data in a user-created FB program can be referred by combining a function, a function block, and a process control function block. |

For a redundant system


| Term | Description |
|-------------------|--|
| Connective system | Refers to the system of a CPU module specified in the "Specify Connection Destination" screen. |
| Other system | Refers to the system connected to the connective system with a tracking cable. |

For definitions of other terms for a redundant system, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

For a system using an RnPSFCPU and a safety system

For definitions of terms for an RnPSFCPU and an RnSF CPU, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

 MELSEC iQ-R Safety Application Guide

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations.

| Generic term/abbreviation | Description |
|---------------------------------|--|
| Built-in Ethernet CPU | A CPU module with an Ethernet port |
| FX5CPU | FX5SCPU, FX5UJCPU, FX5UCPU, FX5UCCPU |
| FX5SCPU | FX5S-30MR/DS, FX5S-30MR/ES, FX5S-30MT/DS, FX5S-30MT/DSS, FX5S-30MT/ES, FX5S-30MT/ESS, FX5S-40MR/DS, FX5S-40MR/ES, FX5S-40MT/DS, FX5S-40MT/DSS, FX5S-40MT/ES, FX5S-40MT/ESS, FX5S-60MR/DS, FX5S-60MR/ES, FX5S-60MT/DS, FX5S-60MT/DSS, FX5S-60MT/ES, FX5S-60MT/ESS, FX5S-80MR/DS, FX5S-80MR/ES, FX5S-80MT/DS, FX5S-80MT/DSS, FX5S-80MT/ES, FX5S-80MT/ESS |
| FX5UCCPU | FX5UC-32MR/DS-TS, FX5UC-32MT/D, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS, FX5UC-32MT/DSS-TS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS |
| FX5UCPU | FX5U-32MR/DS, FX5U-32MR/ES, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/DS, FX5U-64MR/ES, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/DS, FX5U-80MR/ES, FX5U-80MT/DS, FX5U-80MT/DSS, FX5U-80MT/ES, FX5U-80MT/ESS |
| FX5UJCPU | FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, FX5UJ-60MT/ESS, FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, FX5UJ-60MT/DSS |
| FX5-SSC-G(S) | FX5-40SSC-G(S), FX5-80SSC-G(S) (S) refers to the simple motion mode. |
| LCPU | L02S, L02S-P, L02, L02-P, L06, L06-P, L26, L26-P, L26-BT, L26-PBT |
| LHCPU | L04HCPU, L08HCPU, L16HCPU, L32HCPU |
| LD78G(S) | LD78G4(S), LD78G16(S) (S) refers to the simple motion mode. |
| QSCPU | QS001CPU |
| RCPU | RnCPU, RnENCPU, RnPCPU, RnPSFCPU, RnSFCPU |
| RD78G(S) | RD78G4(S), RD78G8(S), RD78G16(S) (S) refers to the simple motion mode. |
| RnCPU | R00CPU, R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU |
| RnENCPU | R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, R120ENCPU |
| RnPCPU | R08PCPU, R16PCPU, R32PCPU, R120PCPU |
| RnPSFCPU | R08PSFCPU, R16PSFCPU, R32PSFCPU, R120PSFCPU |
| RnSFCPU | R08SFCPU, R16SFCPU, R32SFCPU, R120SFCPU |
| Windows® 10 or later | Windows 10, Windows 11 |
| Personal computer | A personal computers on which Windows operates |
| Process CPU | Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU |
| Universal model QCPU | Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q03UDECPU, Q04UDHCPU, Q04UDEHCPU, Q06UDHCPU, Q06UDEHCPU, Q10UDHCPU, Q10UDEHCPU, Q13UDHCPU, Q13UDEHCPU, Q20UDHCPU, Q20UDEHCPU, Q26UDHCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU |
| Universal model process CPU | Q04UDPVCPU, Q06UDPVCPU, Q13UDPVCPU, Q26UDPVCPU |
| High-speed universal model QCPU | Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, Q26UDVCPU |
| Remote head module | An RJ72GF15-T2 CC-Link IE Field Network remote head module |
| Redundant CPU | Q12PRHCPU, Q25PRHCPU |

PART 1

FUNDAMENTALS OF GX Works3

PART 1

This part explains the screen configuration and basic operations of GX Works3.

1 BEFORE USING THIS PRODUCT

2 SCREEN CONFIGURATION AND BASIC OPERATIONS

1 BEFORE USING THIS PRODUCT

GX Works3 is an engineering tool for configuring settings, programming, debugging, and performing the maintenance for programmable controllers such as MELSEC iQ-R series/MELSEC iQ-L series/MELSEC iQ-F series.

By comparing with conventional GX Works2, the functions are enhanced and their operability have been improved.

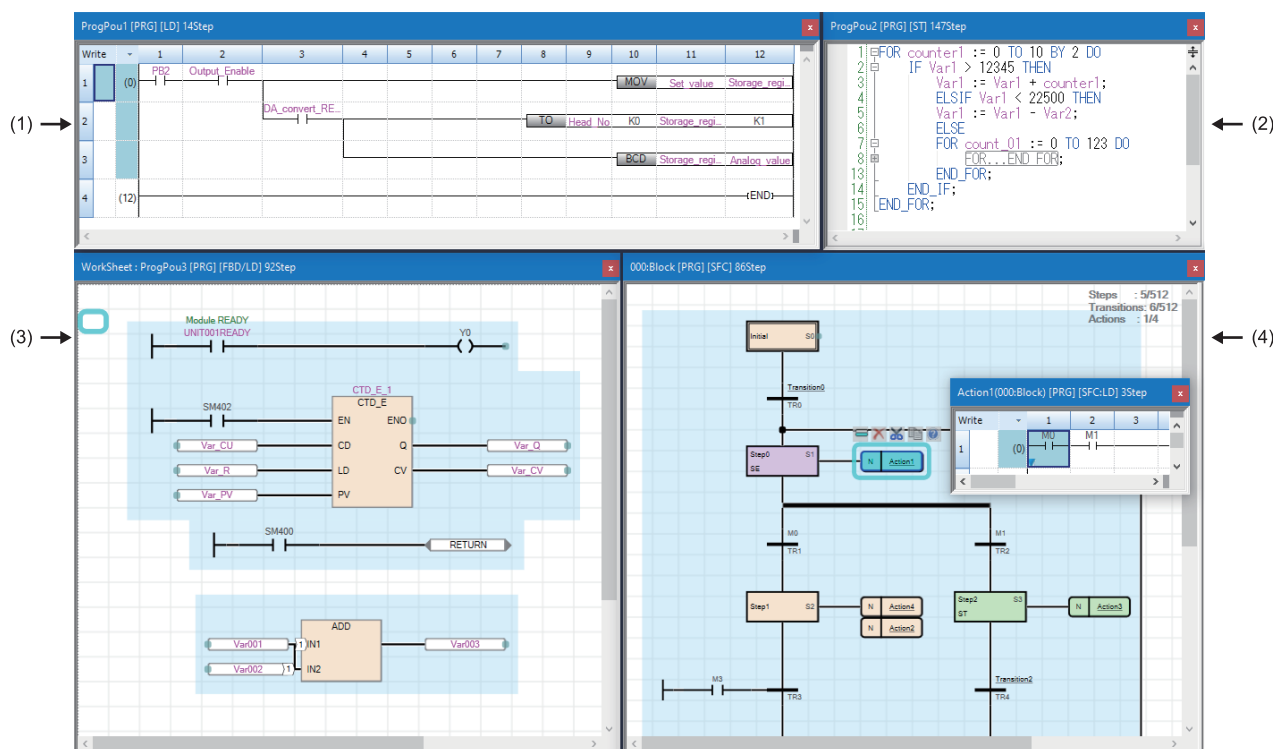
1.1 Main Functions of GX Works3

GX Works3 manages programs and parameters in each project for each CPU module.

GX Works3 functions are shown below.

Program creation function

Programs can be created in a programming language appropriate for the processing contents.



(1): Ladder program

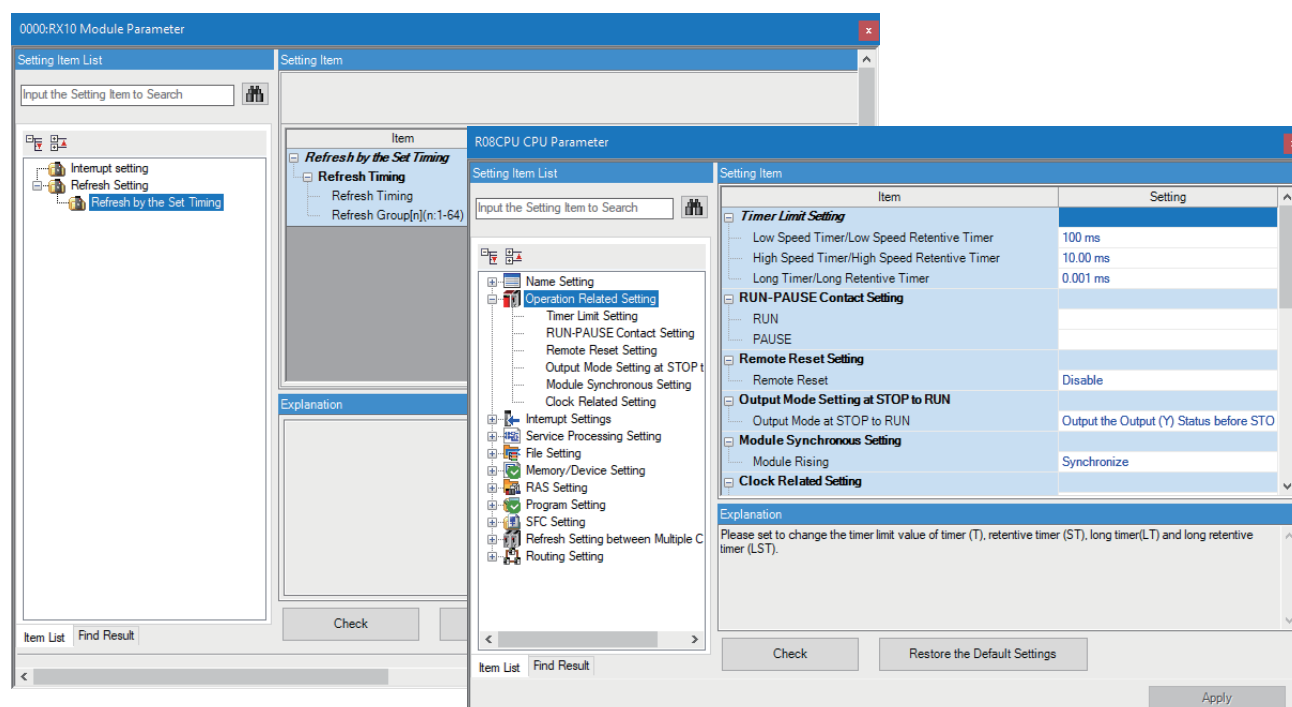
(2): ST program

(3): FBD/LD program

(4): SFC program

Parameter setting function

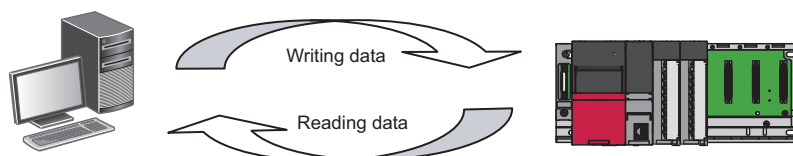
Parameters of CPU modules, I/O modules, and intelligent function modules can be set.



Write to/Read from PLC function

Created sequence programs can be written to or read from a CPU module with the 'Write to PLC' function or the 'Read from PLC' function.

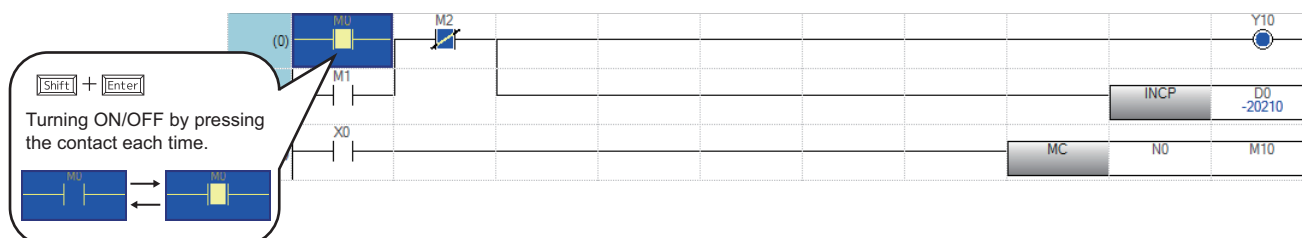
In addition, by using the online change function, sequence programs can be modified even when a CPU module is running.



Monitor/debug function

Data such as device values can be monitored while sequence programs that were written to a CPU module are executed.

Even when a CPU module is not connected, programs can be debugged by using a virtual programmable controller (simulation function).

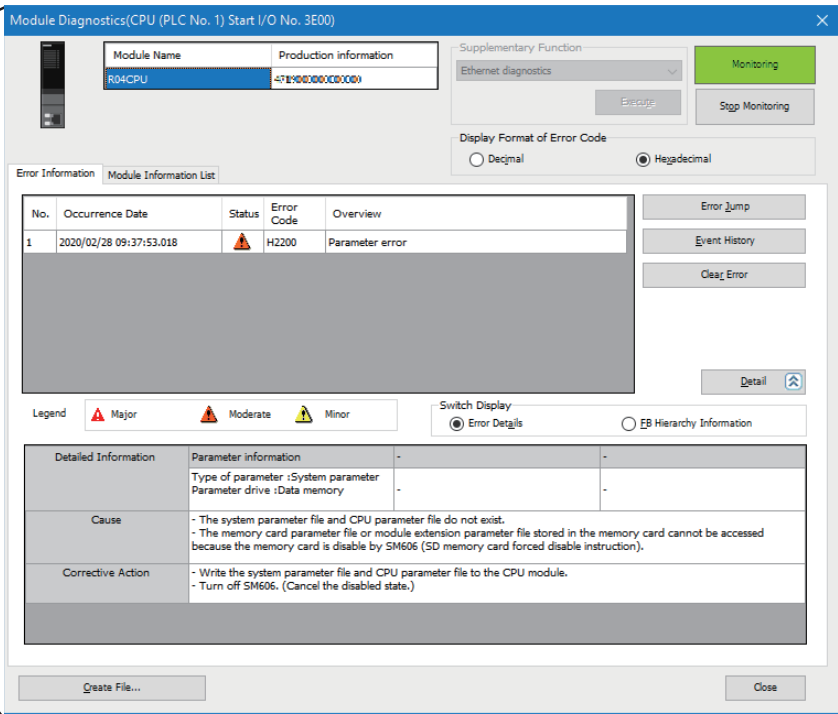
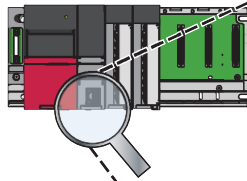


Diagnostics function

The current error status and error history of a CPU module or network can be diagnosed. The recovery time will be shortened by this function.

Detailed information on a module, such as an intelligent function module, can be acquired by using the system monitor function. The recovery time will be much shortened by this function when an error occurs.

■CPU module diagnostics (module diagnostics screen)



Module Diagnostics(CPU (PLC No. 1) Start I/O No. 3E00)

Module Name: R04CPU Production information: 47E4000000000000

Supplementary Function: Ethernet diagnostics [Exclude] [Monitoring] [Stop Monitoring]

Display Format of Error Code: ☐ Decimal ☒ Hexadecimal

Error Information Module Information List

| No. | Occurrence Date | Status | Error Code | Overview |
|-----|-------------------------|--------|------------|-----------------|
| 1 | 2020/02/28 09:37:53.018 | | H2200 | Parameter error |

Legend: Major Moderate Minor

Switch Display: ☒ Error Details ☐ FB Hierarchy Information

| Detailed Information | Parameter information | - | - |
|---|-------------------------------------|---|---|
| Cause | Type of parameter :System parameter | - | - |
| | Parameter drive :Data memory | - | - |
| - The system parameter file and CPU parameter file do not exist. - The memory card parameter file or module extension parameter file stored in the memory card cannot be accessed because the memory card is disable by SM606 (SD memory card forced disable instruction). | | | |
| Corrective Action | | | |
| - Write the system parameter file and CPU parameter file to the CPU module. - Turn off SM606. (Cancel the disabled state.) | | | |

Create File... Close

1.2 RnPCPU

GX Works3 supports both MELSEC iQ-R series RnPCPUs constructing a process control system and a redundant system and process control programs.

In RnPCPUs, two operation modes are available: process mode and redundant mode. The type of a project which can be created differs depending on the selected mode.

| Mode | Description | Reference |
|-----------|---|--|
| Process | To create a project for process control programs | This section |
| Redundant | To create a project for process control programs and the functions for a redundant system | This section Page 29 Redundant system |

Process control system

Refer to the following manual as well as the contents of this manual.

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

List of functions supporting a process control system

GX Works3 includes functions to create process control programs, adjust and maintain a process control system (process control functions). By programming a sequence control and a process control with a single engineering tool, those controls can seamlessly be combined into one.

| Function | Description | Reference |
|---------------------------------------|--|--|
| Tag FB setting | To register tag FB instances and tag data used in an FBD/LD program for process control in a batch | Page 260 Registering Tag FBs |
| User-defined tag FB | To create a function block to refer tag data. It can be created by combining a function, function block, and process control function block. | Page 518 Creating a user-defined tag FB |
| FB property | To display and change the initial values of labels of 'VAR_PUBLIC' class and 'VAR_PUBLIC_RETAIN' class in an FB and a tag FB | Page 387 Setting Initial Values of FB Properties |
| FB property page | To check and change the initial values of FB properties in the dedicated screen. In addition, settings for a function generator can be checked with a graph. | Page 389 Displaying the FB property page |
| FB property management (offline) | To export the initial values of FB properties saved in a project to a CSV file. In addition, the initial values of FB properties can be imported from the CSV file into the project. | Page 408 FB property management (offline) |
| Pause FB/restart FB | To pause and restart the execution of a process control function block in a running program. The operation of a program can be checked by pausing the operation of the preceding process control function block and changing the current value of the output variable of the paused process control function block. | Page 672 Pausing/Restarting the Operation of Function Blocks |
| Faceplate | To display tag data contents in an image of a device such as a controller. The values of each tag data can be changed. To use this function in GX Works3 Version 1.101F or earlier, the latest PX Developer is required to be installed in a personal computer. For GX Works3 Version 1.105K or later, PX Developer is not required. | Page 684 Checking tag data on the gauge window (faceplate) |
| FB property management (online) | To save the current value of an FB property that was read from a programmable controller as the initial value of the property | Page 689 FB Property Management (Online) screen |
| PX Developer Monitor Tool interaction | To manage, monitor, and control the operations of FBD/LD programs for process control, which were created in GX Works3, in PX Developer Monitor Tool. Moreover, a GOT screen project can be created using the GOT screen generator of PX Developer Monitor Tool. | Page 688 PX Developer Monitor Tool interaction |

Settings for using process control functions

The following are required to be set for using process control functions. For other settings, set them in the same manner as a normal project.

■Enabling of the process control extension

Set the following to enable the process control extension for a program file.

- Open the "Properties" screen of a program file for which the process control extension is to be enabled in the navigation window, then select "Yes" for "Use the process control extension."

(it can be set by dragging and dropping a process control function block and tag FB from the element selection window.)

The process control extension can be enabled only for program files of the scan execution type and the fixed cycle execution type.

For the scan execution type, only one program file with the process control extension enabled can be created.

To divide a program with the process control extension enabled into multiple programs, create multiple program blocks in the program file or multiple worksheets in the program block.

■Option setting of the process control extension (required)

Check and set the following options.

| Option item | Setting content | Reason for the setting |
|---|---|---|
| [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" | Check and set each item to fit a project to be created. (☞ Page 91 Process control extension setting) | To use a process control function in a project to be used |
| [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Conversion Operation" ⇒ "Enable Rebuild All (Retain)" | Select "No." | By 'Rebuild All (Retain)' and 'Convert,' only labels added after data was written to a programmable controller cannot be initialized when rewriting the data next time.*1 |
| [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Conversion Operation" ⇒ "Enable Conversion" | | |
| [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Reassign Labels in Executing Rebuild All" | Select "Yes." | |

*1 To initialize added/changed labels only, perform the online program change.

■CPU parameter setting

Set the following items of "CPU Parameter."

| Parameter item | Setting content | Reason for the setting |
|--|---|--|
| "File Setting" ⇒ "File Register Setting" ⇒ "Use Or Not Setting" | Select "Use Common File Register in All Programs." | Tag FBs use file registers. |
| "Memory/Device Setting" ⇒ "Device/Label Memory Area Setting" ⇒ "Device/Label Memory Area Detailed Setting" ⇒ "Device Setting" | Set 'ZR(R)' in the [Latch (2)] tab in the "Latch Range Setting" screen. ^{*1,*2} | File registers used in tag FBs need to be latched. |
| "File Setting" ⇒ "Label Initial Value Reflection Setting" ⇒ "Label Initial Value Reflection Setting at STOP to RUN" | Select "Disable." | To apply initial label values only once to the current values at the timing when the status of a CPU module switches from STOP to RUN after writing the data |
| "Memory/Device Setting" ⇒ "Index Register Setting" ⇒ "Points Setting" ⇒ "Total Points" ⇒ "Index Register (Z)" | Set seven points or higher. | 'Z0' to 'Z6' are used for system data (system header and system footer) to extend a process control. |
| "Redundant System Settings" ⇒ "Tracking Setting" ⇒ "Tracking Device/Label Setting" ^{*3} | Select "Detailed setting." ^{*4} | To transfer (track) file registers used for tag FBs and system data (system header and system footer) |
| "Redundant System Settings" ⇒ "Tracking Setting" ⇒ "Tracking Device/Label Setting" ⇒ "Device/Label Detailed Setting" ^{*3} | For the "Global Device Setting" column except for tracking block No.64, specify devices or file registers that are not used in an FBD/LD program for process control. ^{*5} | If "Detailed setting" is specified for "Tracking Device/Label Setting," devices or labels to be transferred (tracked) need to be set manually. |

*1 The "Latch Range Setting" screen appears by selecting in "Device Setting" ⇒ [...] button of "Detailed Setting" ⇒ [...] button on the "Latch (2)" column

*2 Can also be set by clicking the [Yes] button in the screen that appears when setting "Use Common File Register in All Programs" for the following parameter item:

"File Setting" ⇒ "File Register Setting" ⇒ "Use Or Not Setting"

*3 Required only when a CPU module operation mode is "Redundant."

*4 "Detailed setting" is automatically set for this item if a program with the process control extension enabled is converted.

*5 Ranges of devices and devices set for the following parameter item can be applied to the global device settings in a batch by clicking the [Device Setting Reflection] button in the "Global Device Setting" screen.

"Memory/Device Setting" ⇒ "Device/Label Memory Area Setting" ⇒ "Device/Label Memory Area Detailed Setting" ⇒ "Device Setting"

■Execution interval setting

Set the execution interval for a program with the process control extension enabled to fit the processing.

| Execution type | Setting content |
|----------------|--|
| Scan | Set the execution interval and phase in the "Program File Setting" screen or the "Properties" screen of a program block. (Page 275 Execution interval and phase) |
| Fixed scan | Set the fixed cycle interval in the program setting of CPU parameters. |

■Process control extension toolbar

The following toolbar appears in a project for which the process control functions are usable.



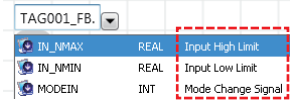

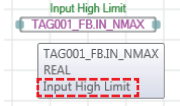
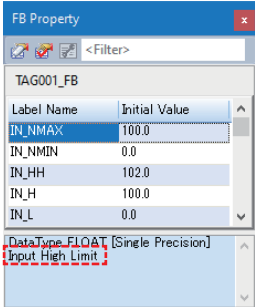
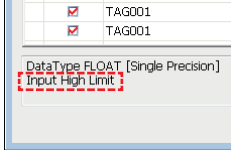
■Multiple comment display setting

Descriptions of the labels in a tag FB and in the structure members of tag data are displayed by setting "English" for "Target" in the "Multiple Comments Display Setting" screen.*1

*1 Appears by selecting the following menu:

[View] ⇒ [Multiple Comments] ⇒ [Display Setting]

The following table shows the display examples.

| Function | Display location | Display example |
|------------------------|---|---|
| FBD/LD editor | Option in the edit box |  |
| | Label comment |  |
| | Tool hint |  |
| FB property | Explanation column in the "FB Property" window |  |
| FB property management | Explanation column in the "FB Property Management (Offline)" screen |  |
| | Explanation column in the "FB Property Management (Online)" screen | |

Precautions

Note the following when the process control extension is enabled for a program file.

| Target project/ program | Item | Consideration |
|--|--|--|
| Program with the process control extension enabled (including a function and a function block used in the program) | Timer device | Time cannot be counted properly if timers, retentive timers, or timer function blocks (TIMER_Q_M) are used. To measure time, use long timers, long retentive timers, pulse timers (TP(_E)), on delay timers (TON(_E)), and off delay timers (TOF(_E)). |
| | Counter device and counter function block | The rises of the count input signals of counters, long counters, or counter function blocks cannot be detected when they are turned ON or OFF in intervals shorter than the execution intervals. Therefore, the values of those devices may be different from expected ones. Turn the count input signal ON or OFF at an interval longer than the execution interval. |
| | Special relay | The values of special relays may be different from expected ones. The values will be ones acquired in the target program. |
| Project including a program with the process control extension enabled | QDRSET(P) instruction | Do not use the QDRSET(P) instruction. If the file name of a file register is changed with the QDRSET(P) instruction, the program will not run properly. |
| | Label class | To hold the values of labels in process control programs when a programmable controller is turned OFF or reset, specify 'VAR_RETAIN,' 'VAR_OUTPUT_RETAIN,' or 'VAR_PUBLIC_RETAIN' as a class for each label |
| | Writing of global label setting (file register) to a programmable controller | When writing global labels to a programmable controller, follow the procedure below. ① Write CPU parameters to a programmable controller. ② Reset or cycle the power of the programmable controller. ③ Write the global label setting (file register)*1. |
| | System resource (file register: ZR or R) | File registers in the range set in the option*2 are used for the system area and a tag data assignment. Therefore, do not use the file registers in programs. However, they can be used for tag data items which are made public. Refer to 'Tag Data List' in the following manual to use file registers. MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions) |
| | System resource (index register: Z) | Index registers in the range displayed in the option*3, Z0 to Z6, are used for the internal processing. Therefore, do not use the index registers Z0 to Z6 in programs with the process control extension enabled and within its programs of the functions/functions. |
| | Periodic execution type program Interrupt program | Due to the following cause, a periodic execution type program*4 and interrupt program*4 may not be executed at the specified timing.*5 • Cause: During the execution of a process control function block, executing a periodic execution type program and interrupt program is prohibited by the DI instruction. (It is released by the EI instrument after the execution of the process control function block is completed.) This may affect high-speed pulse measurement with a CPU module and the result may be inaccurate. In that case, use a counter function of a high-speed counter module or a pulse input module. When using these modules, refer to the manual of the module and create a program. |
| Program with the process control extension disabled | Function block | Do not use the following function blocks. The program will not run properly. • Process control function block • User-defined tag FB • Function block using a process control function block or user-defined tag FB |

*1 When writing the global label setting to a programmable controller, data of file registers in the range set in the following option is automatically written.

[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource" ⇒ "File Register: ZR"

*2 [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource" ⇒ "File Register: ZR"

*3 [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System resource" ⇒ "Index Register: Z"

*4 For details on a periodic execution type program and interrupt program, refer to the following:

MELSEC iQ-R CPU Module User's Manual (Application)

*5 The execution time and the number of execution times of a running program can be checked in the "Program List Monitor" screen.
(Page 677 Checking the Processing Time of a Program)

Differences in terms between GX Works3 and PX Developer

There are differences in terms related to the process control functions between PX Developer and GX Works3 that are engineering tools used to create process control programs. The following table shows the terms in PX Developer and GX Works3 to compare each other.

| Terms for PX Developer | Terms for GX Works3 |
|---|---|
| Reading the current value of an FB property | FB property management (online) |
| FB property management | FB property management (online) |
| Global variable | Global label |
| Cold-start compile | Rebuild all (reassignment) |
| Compile (online change) | Online program change |
| Tag FB variable | Tag FB instance and tag data |
| Device variable | Device |
| Program execution setting | Execution type of a program file |
| Project parameter | [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" |
| Process function, process FB | Process control function block |
| Hot-start compile | Rebuild all (retain), convert |
| User-defined FB | Function block |
| Module FB | Module label and module FB |
| Local variable | Local Label |
| General function, general FB | Standard function, standard function block |
| Public variable | VAR_PUBLIC, VAR_PUBLIC_RETAIN |
| Output variable | VAR_OUTPUT, VAR_OUTPUT_RETAIN |
| Constant | VAR_CONSTANT |
| Internal variable | VAR, VAR_RETAIN |
| I/O simulation setting | [Tool] ⇒ [I/O System Setting] or [Start I/O System Setting] in GX Simulator3 screen |
| Input variable | VAR_INPUT |
| Entry variable monitor | Watch |

Redundant system

A project used for a CPU module in a redundant system configuration can be created by selecting "Redundant" for the operation mode when creating a new project.

In addition, both the control system and the standby system are managed in one project used for CPU modules in a redundant system configuration.

List of functions supporting a redundant system

GX Works3 includes functions to operate CPU modules in a redundant system configuration.

| Function name | Description | Reference |
|--|---|---|
| Operation mode change | To change the operation modes (backup mode or separate mode) | Page 791 Operation mode change |
| System A/B setting | To set system A or system B | Page 793 System A/B setting |
| System switching | To switch the control system to the standby system | Page 791 System switching |
| Memory copy | To transfer the memory contents of the control system to the standby system | Page 792 Memory copy from the control system to the standby system |
| Control system forced start while waiting for the other system started | To start a CPU module as the control system while waiting for another system to start | Page 792 Control system forced start while waiting for the other system started |
| Redundant function module communication test | To test the communication of a redundant function module (R6RFM only) | Page 792 Redundant function module communication test |

Operation modes of RnPCPUs (redundant mode)

There are two operation modes in an RnPCPU (redundant mode): backup mode and separate mode.

The following table shows the operations of each mode in GX Works3.

| Operation mode | Description |
|----------------|--|
| Backup mode | An online operation is performed in both systems. When writing data, same data is written to both systems. |
| Separate mode | An online operation is performed only in the connective system. |

1.3 RnSFCPU

GX Works3 supports MELSEC iQ-R series RnSFCPUs constructing a safety system.

Safety system

In this manual, projects for an RnPSFCPU and an RnSFCPU are defined as 'safety projects,' and other projects are defined as 'standard projects.'

There are two types of data in a safety project: safety data and standard data.

Both a safety program and a standard program can be created in a safety project.

| Name | | Description |
|-----------------|-----------------------------------|--|
| Data | Safety data | Safety program, safety FB/FUN, safety global label, and parameter for RnPSFCPU and RnSFCPU |
| | Standard data | Standard program, standard FB/FUN, standard global label, standard/safety shared label, and parameter for CPU modules other than RnPSFCPU and RnSFCPU |
| Program, FB/FUN | Safety program, safety FB/FUN | Program for a safety control |
| | Standard program, standard FB/FUN | Program for a general control |
| Label | Safety global label | Global label that can be used only in safety programs |
| | Standard global label | Global label that can be used only in standard programs |
| | Standard/safety shared label | Global label that can be used in both safety programs and standard programs. When using a standard/safety shared label in a safety program, create the program so that a safety condition can be checked. |

Usable devices, labels, and FBs/FUNs

Usable devices, labels, and FBs/FUNs are different between a safety project and a standard project.

■ Usable devices/labels

| Project | Safety device | Safety global label | Standard/safety shared label | Standard device | Standard global label |
|------------------|---------------|---------------------|------------------------------|-----------------|-----------------------|
| Safety program | ○ | ○ | ○ | × | × |
| Standard program | × | × | ○ | ○ | ○ |

For details on the usable devices in each project, refer to the following:

📖 Page 929 Applicable Devices in GX Works3

■ Usable FBs/FUNs

| Project | Safety FB | Safety FUN | Standard FB | Standard FUN |
|------------------|-----------|------------|-------------|--------------|
| Safety program | ○ | ○ | × | × |
| Standard program | × | × | ○ | ○ |

List of functions supporting a safety system

GX Works3 includes functions to create a safety project.

| Function name | Description | Reference |
|--------------------------------------|---|---|
| Safety operation mode switching | To switch the safety operation modes of CPU modules | Page 794 Safety operation mode switching |
| User authentication | To perform user authentication before opening a project in order to prevent illegal access from users with no authority | Page 707 Preventing Illegal Access to a Project (User Authentication) |
| | To perform user authentication before accessing a CPU module or SD memory card inserted in a CPU module in order to prevent illegal access from users with no authority | |
| Identification check for safety data | To check if data in a CPU module is the one written by the user | Page 797 Identification check for safety data |

Safety operation modes

There are two safety operation modes: safety mode and test mode.



The following table shows the operations of each mode in GX Works3.

| Operation mode | Description |
|----------------|---|
| Safety mode | A mode used when running a system. This mode prohibits operations which change the control of a CPU module such as data writing to a CPU module, current value change, CPU memory operation, and settings for a security key and a file password. |
| Test mode | A mode used when starting a system or performing maintenance. All functions can be used. (The available functions differ depending on the access level of user who is logging on to the personal computer.) |

Safety data identification display

For safety data, an icon in the navigation window and the background color of a parameter editor are emphasized.


For details, refer to the following:

- Navigation window:  Page 54 Safety data identification display
- Parameter editor:  Page 210 Safety data identification display

1.4 RnPSFCPU

GX Works3 supports MELSEC iQ-R series RnPSFCPU constructing a process control system, a safety system, and a redundant system.

For details on an RnPSFCPU system, refer to the following:


 MELSEC iQ-R CPU Module User's Manual (Application)

Process control system

Two types of programs, safety program and standard program, can be created in a project for an RnPSFCPU.


Process control programs can only be created in a standard program.

For a process control system, refer to the following:

 Page 23 Process control system


Safety system

For a safety system, refer to the following:

 Page 30 Safety system

List of functions supporting a safety system using an RnPSFCPU

For the functions common to a safety system using an RnPSFCPU, refer to the following:

 Page 30 List of functions supporting a safety system

The following functions can be used only in a system using an RnPSFCPU.

| Function name | Description | Reference |
|-------------------------|--|---|
| User authentication | To log off from a CPU module that user authentication is performed | Page 716 Logging off from a CPU module |
| | To copy user information to the other system to match it between both systems | Page 716 Copying user information to the other system |
| Safety module operation | To set whether or not to enable the safety communication function for modules used in a system using an RnPSFCPU | Page 798 Safety module operation |

Redundant system

Only the redundant mode can be selected for the operation mode of an RnPSFCPU.

For a redundant system, refer to the following:

 Page 29 Redundant system

Operation modes of RnPSFCPU

Only the backup mode can be selected for the operation mode of an RnPSFCPU.

An online operation is performed in both systems in the backup mode.

1.5 Remote Head Module

GX Works3 supports MELSEC iQ-R series remote head modules.

Any programs cannot be created for a project of a remote head module.

Therefore, a program needs to be created for a project of a CPU module on the master station.

In addition, a remote head module supports a redundant system configuration and a system configuration of the safety communication relay function.

When creating a new project, a module type needs to be selected according to the system configuration to be created.

For details, refer to the following:

 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)

1.6 NCCPU

GX Works3 supports MELSEC iQ-R series NCCPUs.

In a project for an NCCPU, ladder programs including devices can be applied. Data of labels and parameters can be edited but they are not written.

For details on NCCPUs, refer to the manual of NCCPUs.

1.7 Procedure from Project Creation to CPU Module Operation

The operating procedure from program creation to a CPU module operation in GX Works3 is shown below.

For the operation methods of a CPU module, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

📖 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)

Standard project

Target module type: RnCPUs, RnENCPUs, RnPCPUs (with the process control extension disabled)

Start



1. Create a project.

Start GX Works3.

Create a new project.

📖 Page 47 Start

📖 Page 105 Creating a project



2. Set the parameters.

📖 Page 207 Setting Parameters



3. Create a program.

Create a Program Organization Unit (POU).

Set an execution order and an execution type.

Set the global labels/local labels.

Edit the program of each POU.

Perform conversion.

📖 Page 132 Creating data

📖 Page 272 Program Execution Order and Execution Type Settings

📖 Page 235 Registering Labels

📖 Page 276 Creating a Ladder Program, Page 320 Creating an ST Program,

Page 330 Creating an FBD/LD Program, Page 353 Creating an SFC Program,

Page 505 Creating a Function Block, Page 525 Creating a Function

📖 Page 432 Converting Programs



4. Perform debugging with the simulator.

📖 Page 538 PROGRAM SIMULATION




5. Connect a personal computer to a CPU module, and set the connection destination.

📖 Page 577 SETTING ROUTE TO CPU MODULE



6. Write parameters/programs to the CPU module.

 Page 600 Writing data to a programmable controller




7. Check the operation.

Monitor the execution status and device contents of the program to check the operation.

Check the error occurrence in the CPU module.

 Page 636 Checking Execution Programs on a Program Editor

 Page 733 Module Diagnostics



8. Operate the system.

Process control project

Target module type: RnPCPUs (with the process control extension enabled)

For the creation method of programs, refer to the following manual as well as the contents of this manual.

 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)


Start



1. Create a project.

Start GX Works3.

Create a new project.

 Page 47 Start

 Page 105 Creating a project



2. Set the parameters.

 Page 207 Setting Parameters



3. Set the settings for using process control functions.

Enable the process control extension of a program file.

Set the option setting of the process control extension.

Set the option setting of the conversion operation.

Set the CPU parameters.

 Page 24 Settings for using process control functions



4. Create a program.

Register a tag FB.


Create an FBD/LD program for process control.

Set the initial value of an FB property.


Create a program for sequence control.

Perform conversion.

 Page 260 Registering Tag FBs

 Page 132 Creating data

 Page 387 Display/setting an FB property, Page 408 FB property management (offline)

 Page 330 Creating an FBD/LD Program, Page 505 Creating a Function Block, Page 348 Utilizing a tag FB, Page 518 Creating a user-defined tag FB, Page 525 Creating a Function

 Page 432 Converting Programs




5. Connect a personal computer to a CPU module, and set the connection destination.

 Page 577 SETTING ROUTE TO CPU MODULE





6. Write parameters/programs to the CPU module.

 Page 600 Writing data to a programmable controller





| |
|---|
| 7. Check the operation. |
| Monitor the execution status and device contents of the program to check the operation. |
| Check the error occurrence in the CPU module. |
| Check the control status of a tag FB on a faceplate. |
| Change the current value of an FB property on the watch window. |
| Set the current value of an FB property as the initial value of the FB property. |

 Page 636 Checking Execution Programs on a Program Editor, Page 672
Pausing/Restarting the Operation of Function Blocks

 Page 733 Module Diagnostics

 Page 658 Checking Current Values by Registering Devices/Labels

 Page 684 Checking Tag Data

 Page 689 FB Property Management (Online) screen



| |
|------------------------|
| 8. Operate the system. |
|------------------------|

Safety project

Target module type: RnSFCPU, RnPSFCPU (with the process control extension disabled)

Start



| |
|----------------------------|
| 1. Create a project. |
| Start GX Works3. |
| Create a new project. |
| Register user information. |
| Save the project. |

☞ Page 47 Start

☞ Page 105 Creating a project

☞ Page 709 User management

☞ Page 129 Saving a project



| |
|---|
| 2. Set the parameters. |
| Setting the safety device/label area is required. |

☞ Page 207 Setting Parameters



| |
|---|
| 3. Create a program. |
| Create a Program Organization Unit (POU). |
| Set an execution order and an execution type. |
| Set the global labels/local labels. |
| Edit the program of each POU. |
| Perform conversion. |

☞ Page 132 Creating data

☞ Page 272 Program Execution Order and Execution Type Settings

☞ Page 235 Registering Labels

☞ Page 276 Creating a Ladder Program, Page 505 Creating a Function Block, Page 525 Creating a Function

☞ Page 432 Converting Programs



| |
|---|
| 4. Connect a personal computer to a CPU module, and set the connection destination. |
|---|

☞ Page 577 SETTING ROUTE TO CPU MODULE





| |
|---|
| 5. Write parameters/programs to the CPU module. |
|---|

☞ Page 600 Writing data to a programmable controller





| |
|---|
| 6. Check the operation. (Test mode) |
| Monitor the execution status and device contents of the program to check the operation. |
| Check the error occurrence in the CPU module. |

 Page 636 Checking Execution Programs on a Program Editor
 Page 733 Module Diagnostics



| |
|---|
| 7. Switch the safety operation modes. |
| Check whether the written project is correct. |
| Switch it the safety mode. |

 Page 797 Identification check for safety data
 Page 794 Safety operation mode switching



| |
|------------------------|
| 8. Operate the system. |
|------------------------|

Safety project for which the process control extension is set to be used

Target module type: RnPSFCPU (with the process control extension enabled)





For the creation method of programs, refer to the following manual as well as the contents of this manual.

 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

Start



| |
|----------------------------|
| 1. Create a project. |
| Start GX Works3. |
| Create a new project. |
| Register user information. |
| Save the project. |

 Page 47 Start
 Page 105 Creating a project
 Page 709 User management
 Page 129 Saving a project



| |
|---|
| 2. Set the parameters. |
| Setting the safety device/label area is required. |

 Page 207 Setting Parameters



| |
|--|
| 3. Set the settings for using process control functions. |
| Enable the process control extension of a program file. |
| Set the option setting of the process control extension. |
| Set the option setting of the conversion operation. |
| Set the CPU parameters. |

 Page 24 Settings for using process control functions



| |
|---|
| 4. Create a program. |
| Register a tag FB. |
| Create an FBD/LD program for process control. |
| Set the initial value of an FB property. |
| Create a program for sequence control. |
| Perform conversion. |

☞ Page 260 Registering Tag FBs

☞ Page 132 Creating data

☞ Page 387 Display/setting an FB property, Page 408 FB property management (offline)

☞ Page 330 Creating an FBD/LD Program, Page 505 Creating a Function Block, Page 348 Utilizing a tag FB, Page 518 Creating a user-defined tag FB, Page 525 Creating a Function

☞ Page 432 Converting Programs



| |
|---|
| 5. Connect a personal computer to a CPU module, and set the connection destination. |
|---|

☞ Page 577 SETTING ROUTE TO CPU MODULE



| |
|---|
| 6. Write parameters/programs to the CPU module. |
|---|

☞ Page 600 Writing data to a programmable controller



| |
|---|
| 7. Check the operation. (Test mode) |
| Monitor the execution status and device contents of the program to check the operation. |
| Check the error occurrence in the CPU module. |
| Check the control status of a tag FB on a faceplate. |
| Change the current value of an FB property on the watch window. |
| Set the current value of an FB property as the initial value of the FB property. |

☞ Page 636 Checking Execution Programs on a Program Editor, Page 672 Pausing/Restarting the Operation of Function Blocks

☞ Page 733 Module Diagnostics

☞ Page 658 Checking Current Values by Registering Devices/Labels

☞ Page 684 Checking Tag Data

☞ Page 689 FB Property Management (Online) screen



| |
|---|
| 8. Switch the safety operation modes. |
| Check whether the written project is correct. |
| Switch it the safety mode. |

☞ Page 797 Identification check for safety data

☞ Page 794 Safety operation mode switching



| |
|------------------------|
| 9. Operate the system. |
|------------------------|

Start



1. Create a project.

Start GX Works3.

Create a new project.

📖 Page 47 Start

📖 Page 105 Creating a project



2. Set the parameters.

📖 Page 207 Setting Parameters



3. Set the labels.

Set the global labels.

📖 Page 235 Registering Labels



4. Connect a personal computer to a Remote head module, and set the connection destination.

📖 Page 577 SETTING ROUTE TO CPU MODULE



5. Write parameters/labels to the Remote head module.

📖 Page 600 Writing data to a programmable controller



6. Check the operation.

Monitor the execution status and device contents of the sequence program to check the operation.

📖 Page 733 Module Diagnostics



7. Operate the system.

1.8 Learning Operation Methods of GX Works3

This section explains the operation methods of GX Works3.

Displaying Help


Use Help to learn about operations and functions, and check error codes of a CPU module.

Operating procedure

Select [Help] ⇒ [GX Works3 Help] (🔍).

e-Manual Viewer starts and the manual appears.






Find Help

Enter a search term in 🔍 on the toolbar and press the  key to start searching it in e-Manual Viewer. The search is executed in the manuals registered in e-Manual Viewer.

Help of an element

The manual section that is related to an element can be displayed from each screen.

The following table shows the operation in each screen and the elements that can display the manual.

| Screen | | Operation | Target element |
|--------------------------|--------------------|---|--|
| Navigation window | | Select an element, and press the  key. | Instruction |
| Element selection window | | | Function* ¹ Function block* ¹ Module FB User library* ¹ library POU* ¹ |
| Program editor | Ladder editor | Place the cursor on an instruction, function, or function block, and press the  key. | Instruction Function* ¹ |
| | ST editor | Place the cursor on a token, and press the  key. | Function block* ¹ Module FB |
| | FBD/LD editor | Place the cursor on an element, and press the  key. | Special relay Special register |
| | SFC diagram editor | Place the cursor on an SFC element or FBD/LD element, and press the  key. | User library* ¹ Library POU* ¹ |
| Enter ladder screen | | Click the [Manual] button. | Instruction |
| Input argument screen | | | |

*1 If the element is associated with a help file, the help file opens. (It is not displayed if the operation is performed in an SFC diagram editor.)


For the method for associating data with a help file, refer to the following:

📖 Page 141 Associating data with a help file

Help of a function

The manual section that is related to the following function can be displayed while using the function.

■Faceplate

Press  on a faceplate.

Connecting to MITSUBISHI ELECTRIC FA Global Website

Open the MITSUBISHI ELECTRIC FA Global Website in a web browser.
Make sure your personal computer connect to the Internet in advance.

Operating procedure

Select [Help] ⇒ [Connection to MITSUBISHI ELECTRIC FA Global Website].

Checking the version of GX Works3

Display information such as the software version of GX Works3.

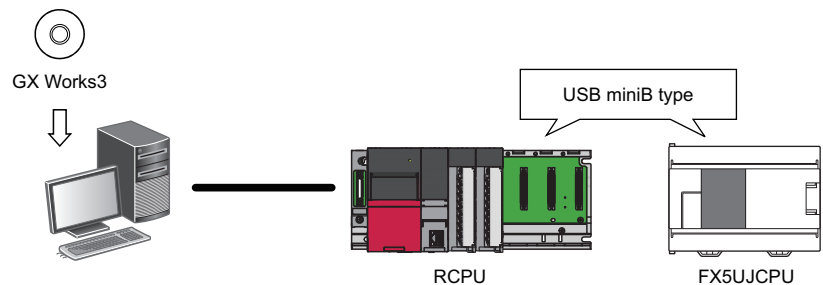
Operating procedure

Select [Help] ⇒ [Version Information].

1.9 Connection Configurations between a Personal Computer and a CPU Module

The following section shows the configurations when connecting a personal computer and a CPU module or remote head module.

Connection through USB ports



The USB cables, of which the operations are ensured by Mitsubishi Electric Corporation, are shown below. When using a USB cable for the first time, install the USB driver.

For details, refer to the following:

☞ Page 1048 USB Driver Installation Procedure

| Product name | Model name | Manufacturer |
|---|----------------|--|
| USB cable (USB A type — USB miniB type) | KU-AMB530 | SANWA SUPPLY INC. |
| | KU-AMB550 | |
| | MR-J3USBCBL3M | Mitsubishi Electric Corporation |
| | GT09-C30USB-5P | Mitsubishi Electric System & Service Co., Ltd. |
| USB adapter (USB B type — USB miniB type) | AD-USBBFTM5M | ELECOM CO., LTD. |

For the considerations when accessing a CPU module, refer to the following:

☞ Page 596 Communication with the CPU module using a USB cable

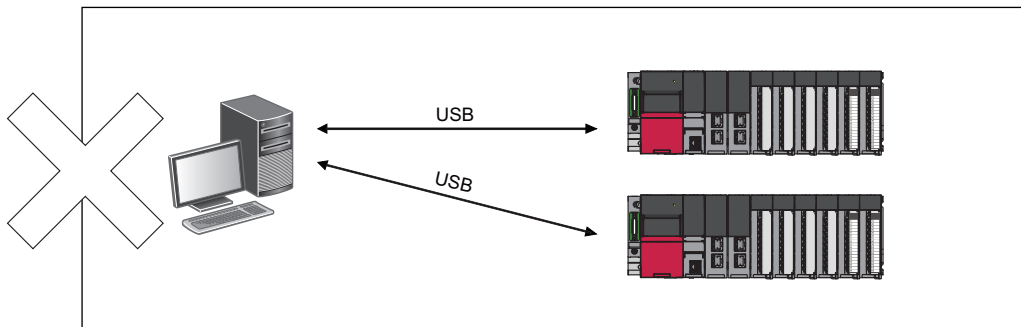
FX5UCPUs and FX5UCCPUs do not support this connection.

■ Configuration of USB connection

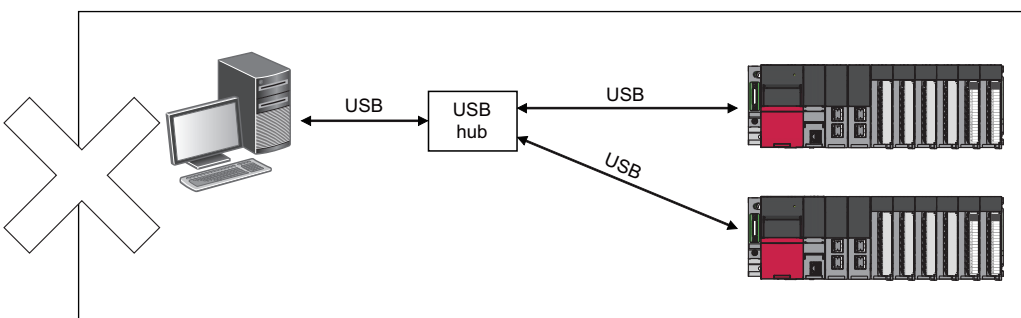
Only one CPU module can be connected to a personal computer at the same time.

Connection with a CPU module in the following configurations is not applied.

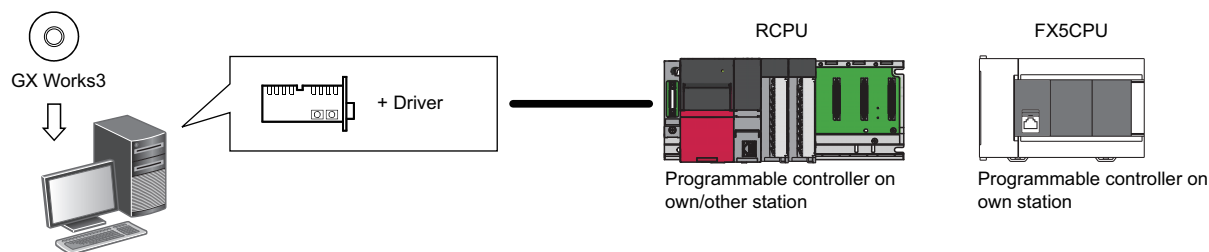
- Connection to multiple CPU modules from a personal computer with multiple USB ports



- Connection to multiple CPU modules via a USB hub



Connection through I/F boards

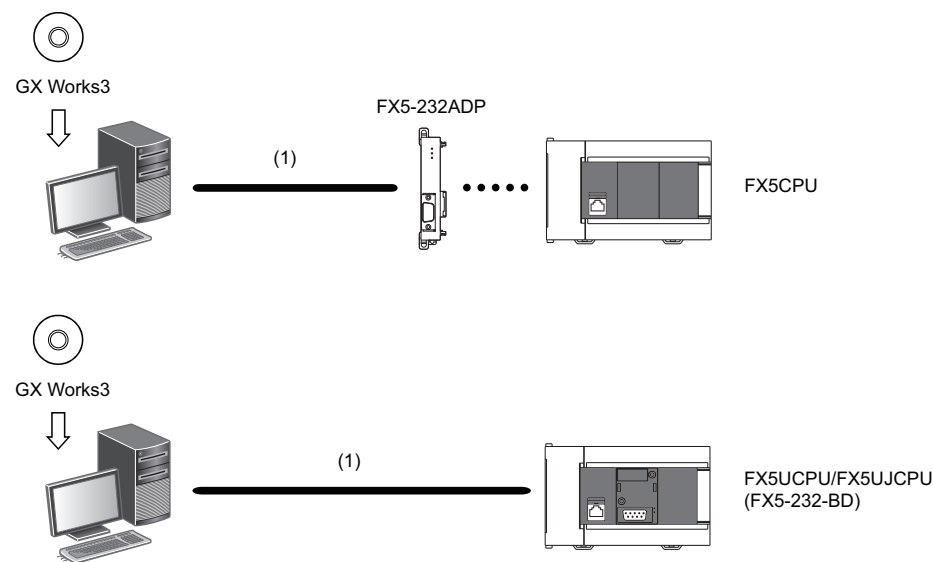


The following I/F boards are supported.

- Ethernet board: An Ethernet board that is built-in to a personal computer or commercially available
- CC-Link IE Controller Network interface board^{*1}, CC-Link IE Field Network interface board^{*1}, CC-Link Ver.2 board^{*1}, CC-Link IE TSN interface board^{*1}: Refer to the manuals of each I/F board for details.

^{*1} LHCPUs and FX5CPUs do not support it.

Connection through serial ports



| Product name | Model name | Manufacturer |
|------------------|-------------|---------------------------------|
| (1) RS-232 cable | FX-232CAB-1 | Mitsubishi Electric Corporation |

RCPU's and remote head modules do not support this connection.

2 SCREEN CONFIGURATION AND BASIC OPERATIONS

This chapter explains the screen configuration and basic operations of GX Works3.

2

2.1 Start and End

This section explains the methods for starting and ending GX Works3.

Start

Operating procedure

Start GX Works3 from "MELSOFT" in Windows Start.

■Important notification message

The message "Important notification exists." may appear when starting GX Works3 in the following cases:

- MELSOFT Update Manager Version 1.012N or later is installed.
- The personal computer is connected to the Internet.

In that case, read the message and take a corrective action as necessary.

■Starting GX Works3 by specifying the display position and window size

The display position and window size of GX Works3 at startup can be specified by specifying the following options in a command line.

In addition, offline monitoring can be started after starting GX Works3.

- To start in full screen
-WINDOWSIZE
- To start by specifying the display position (left^{*1}, top^{*2}) and window size (width, height)
-WINDOWSIZE=left,top,width,height
- To display the screen for selecting a recording file to be used for offline monitoring after startup
-OFFLINEMONITOR
- To start offline monitoring of a recording file specified in the file path after startup
-OFFLINEMONITOR=path

- *1 For 'left,' enter an integer value by taking the upper left of the main display as the coordinates (0,0) and the rightward direction as positive.
When specifying '0,' the window frame is displayed transparently by Windows settings; therefore, a gap appears for a few pixels on the left side of the main display.
(This can be avoided by turning high contrast mode ON in Windows settings.)
- *2 For 'top,' enter an integer value by taking the upper left of the main display as the coordinates (0,0) and the downward direction as positive.

Ex.

When starting GX Works3 from the command prompt, specify an option after 'gxw3' as follows.

In addition, specify the installation folder of GX Works3 for the current directory.

- To start in full screen
gxw3 "-WINDOWSIZE"
- To start at the specified display position and in the specified window size, and open a GX Works3 project (D:\Files\Project1.gx3)
gxw3 "-WINDOWSIZE=10,20,800,600" "D:\Files\Project1.gx3"
- To display the screen for selecting a recording file to be used for offline monitoring after startup
gxw3 "-OFFLINEMONITOR"
- To start offline monitoring of a recording file (D:\Files\record.melrc) after startup
gxw3 "-OFFLINEMONITOR=D:\Files\record.melrc"
- To start in full screen and start offline monitoring of a recording file (D:\Files\record.melrc)
gxw3 "-WINDOWSIZE" "-OFFLINEMONITOR=D:\Files\record.melrc"

Ex.

When starting GX Works3 from a shortcut, specify an option in "Target" in the shortcut properties as follows.

- To start in full screen
"C:\Program Files (x86)\MELSOFT\GPPW3\GXW3.exe" "-WINDOWSIZE"
- To start at the specified display position and in the specified window size, and open a GX Works3 project (D:\Files\Project1.gx3)
"C:\Program Files (x86)\MELSOFT\GPPW3\GXW3.exe" "-WINDOWSIZE=100,50,1200,900" "D:\Files\Project1.gx3"
- To display the screen for selecting a recording file to be used for offline monitoring after startup
"C:\Program Files (x86)\MELSOFT\GPPW3\GXW3.exe" "-OFFLINEMONITOR"
- To start offline monitoring of a recording file (D:\Files\record.melrc) after startup
"C:\Program Files (x86)\MELSOFT\GPPW3\GXW3.exe" "-OFFLINEMONITOR=D:\Files\record.melrc"
- To start in full screen and start offline monitoring of a recording file (D:\Files\record.melrc)
"C:\Program Files (x86)\MELSOFT\GPPW3\GXW3.exe" "-WINDOWSIZE" "-OFFLINEMONITOR=D:\Files\record.melrc"

End

Operating procedure

Select [Project] ⇔ [Exit].

Point

GX Works3 can also be started or ended in MELSOFT Navigator.

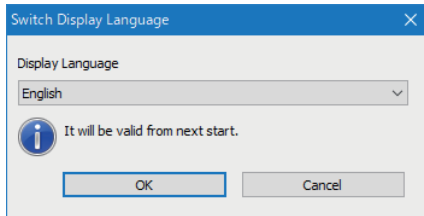
2.2 Display Language Switching

GX Works3 supports multiple languages, and therefore the display language such as one on the menu can be switched on a personal computer.

2

Window

Select [View] ⇒ [Switch Display Language].



Precautions

- If the display language differs from the one for the operating system, texts may not displayed properly in the screen. (Displayed texts may get cut.)
- When switching the display language in Windows 10 or later, supplemental fonts of the target language are required. The fonts can be added by the following operation:
Select [Apps] ⇒ [Apps & features] ⇒ [Optional features] ⇒ [Add a feature] in Windows settings.
- A character entered arbitrarily is not switched even if the display language is switched.

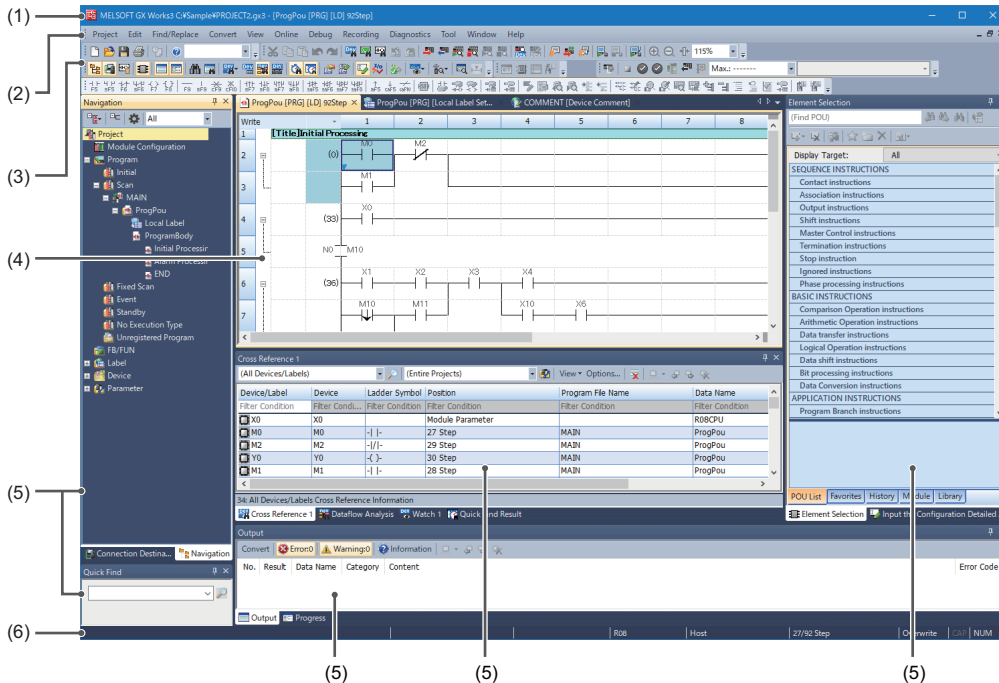
2.3 Screen Configuration

This section explains the screen configuration when starting GX Works3.

Main frame

The main frame configuration is shown below.

The following screen includes a work window and docked windows displayed.



Displayed items

| Name | Description |
|-------------------|--|
| (1) Title bar | A project name, etc. are displayed. |
| (2) Menu bar | Menu options for performing each function are displayed. |
| (3) Toolbar | Tool buttons for performing various functions are displayed. |
| (4) Work window | A main screen used for operations such as programming, parameter setting, and monitoring |
| (5) Docked window | A sub screen to support operations performed in a work window |
| (6) Status bar | Information on the project being edited is displayed. |

Window operation

■Displaying docked windows

[View] ⇒ [Docking Window] ⇒ [(target item)]



When the docked window is not displayed by selecting it from the menu, select [Window] ⇒ [Return Window Layout to Initial Status].

■Switching docked windows and a work window

Various windows or files can be switched by pressing the **Ctrl** + **Tab** keys.

Select a particular window or file by pressing the **Ctrl** + **←** / **→** / **↑** / **↓** keys.

■Arranging work windows

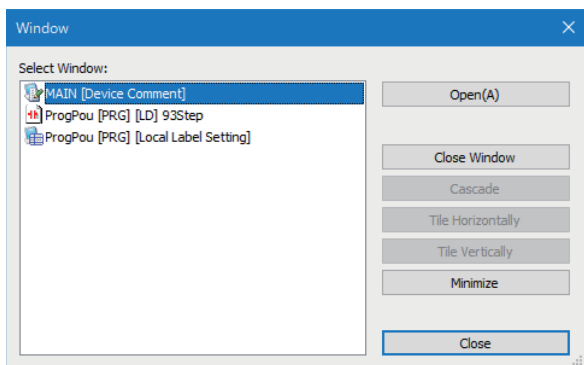
The list of open windows appears.

A specified window can be opened and arranged.

When multiple windows are open, they can efficiently be displayed by arranging them.

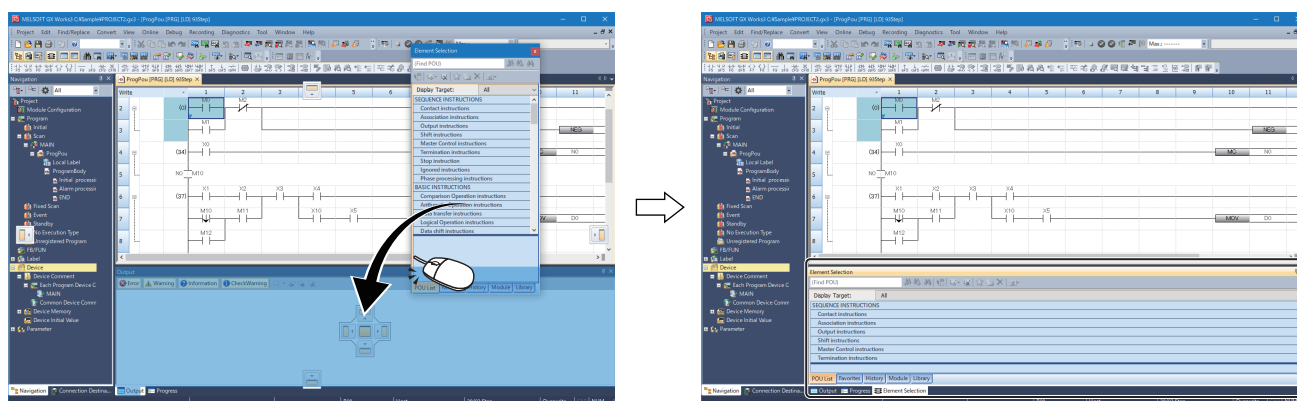
Window

Select [Window] ⇒ [Window].



■Docking/floating dockable windows

- Docked display: Drag the title bar of a floating dockable window and drop it to the displayed icon (guidance) to dock the main frame.



- Floating display: Drag the title bar of a docked window and drop it to the arbitrary position to float from the main frame.

■Docking/floating work windows

- Docked display: Select the floating work window and select [Window] ⇒ [Docking].
- Floating display: Select the docked work window and select [Window] ⇒ [Floating].

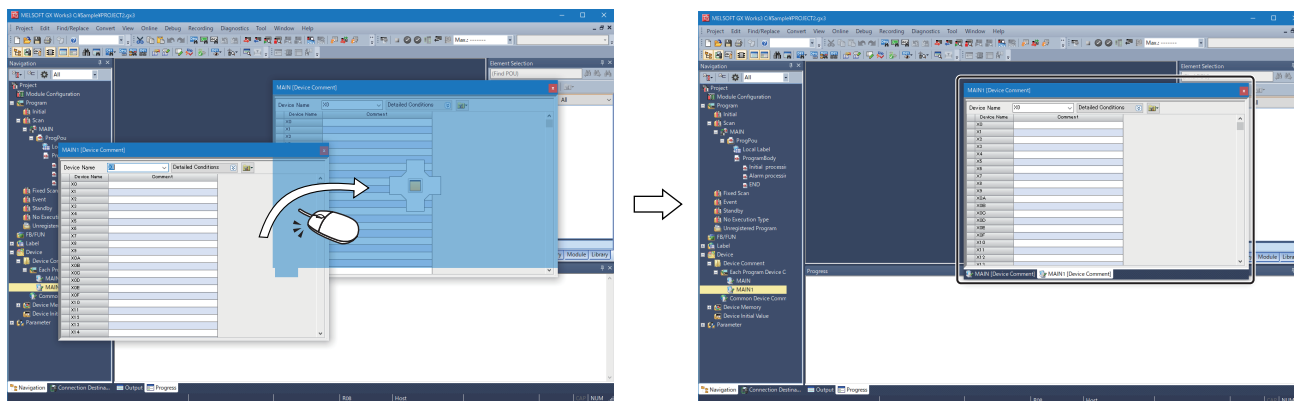


Docked windows can be switched between the docked display and the floating display by double-clicking the title bar.





■Combining work windows in one window

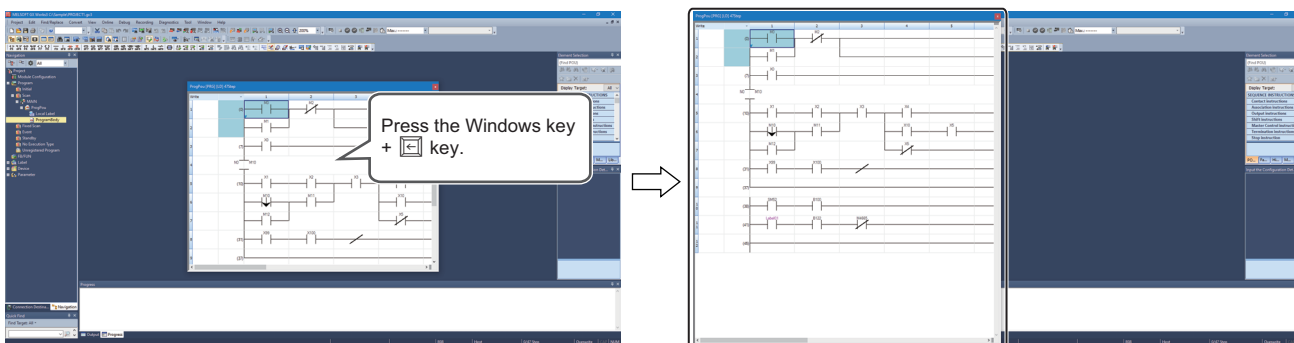
When dragging a floating work window close to another one, the guidance appears.

By dropping the work window onto the guidance, it is combined to the other window.



■Moving a work window

A work window can be moved vertically and horizontally by selecting the floating work window and pressing the Windows key +  /  /  /  keys.



Precautions

The display position of a moved work window may differ between Windows 10 and Windows 11 or later.


Customizing/resetting toolbars

Set the types of tool buttons to be displayed on each toolbar.


The selected tool buttons on the list are displayed on the toolbar.

Operating procedure

■Customizing toolbar

1. Click  on the toolbar, and select [Add or Remove Buttons] ⇒ [(toolbar name)].
2. Select the tool button to be displayed from the list.

■Resetting toolbar

Click  on the toolbar, and select [Add or Remove Buttons] ⇒ [Customize].

Navigation window

The navigation window displays project data in a tree format.

Operations such as creating new data and displaying editing screens can be performed on the tree.

For details, refer to the following:

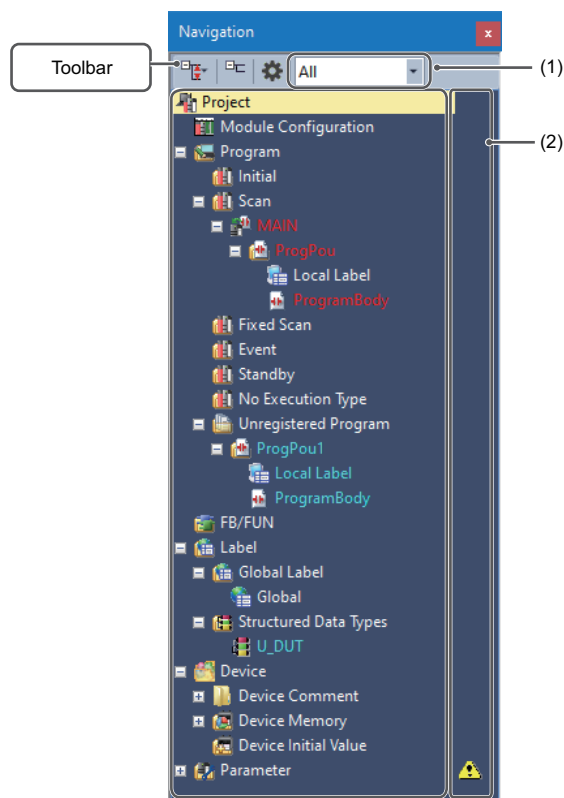
☞ Page 131 Creating Data

For the configuration of the data displayed in the navigation window, refer to the following:

☞ Page 102 Data configuration

Window

Select [View] ⇒ [Docking Window] ⇒ [Navigation] ().



POUs, global labels, and structures are displayed in the following color.


| Color | Data |
|------------|---|
| White | Converted data |
| Red | Unconverted data Unused data before conversion |
| Light blue | Unconverted data ^{*1} |

*1 Data that failed in conversion is displayed as unused data before conversion.

Displayed items

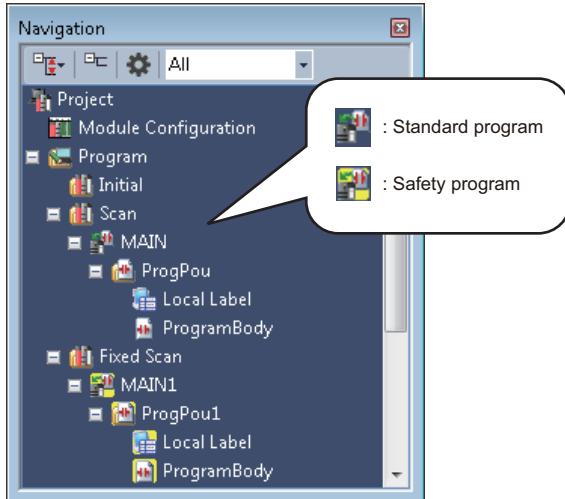
| Name | Description | Reference |
|------------------|---|----------------------|
| (1) Filter | Data displayed in a tree format can be filtered. <ul style="list-style-type: none"> • ALL: All items are displayed. • Parameter: Module Configuration and Parameter are displayed. • Program: Program, FB/FUN, Label, and Device are displayed. | — |
| (2) Status icons | To display icons indicating the status of a project. | Page 56 Status icons |


The font color and the background color can be changed.

 Page 82 Checking and Changing Colors and Fonts

Safety data identification display

For safety data, an icon is emphasized.



The data category (standard/safety) can be checked in the "Properties" screen of each data. ( Page 143 Properties)

Sorting data

Sort data displayed in the tree format.

Operating procedure

Select and right-click any of the following items, then select [Sort] ⇒ [(sort type)] from the shortcut menu.

- Execution Type
- Program File
- Program Block
- User folder
- FB/FUN
- FB File
- Function Block
- FUN File
- Function
- Global Label
- Structure
- Each Program Device Comment
- Device Memory
- Device Initial Value
- Module Information

Point

- Data can be sorted by dragging and dropping the data or selecting [Order] ⇒ [Move Up]/[Move Down] from the shortcut menu.
- Program files, program blocks, and worksheets can be sorted in a batch by selecting and right-clicking "Project," then selecting [Sort All] ⇒ [Name]/[Last Change]/[Execution Order] from the shortcut menu.

Creating a user folder

A user folder for grouping and managing the created data can be created.

Operating procedure




1. Select a program file and select [Project] ⇒ [Data Operation] ⇒ [New Folder].
2. Change a folder name.
3. Select a program to be stored and drag and drop it onto the created user folder.

Simple display

An unused folder can be hidden by clicking  on the toolbar.

Status icons


The following table shows icons indicating the status of a project.

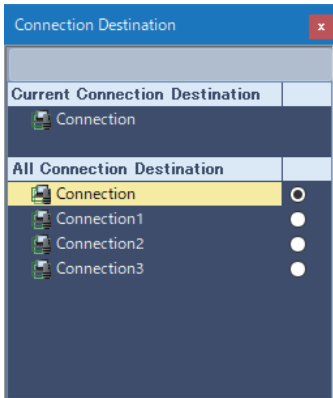
| Icon | Status | Display timing | Item | Description |
|---|--|---|--|---|
|  | Parameter mismatched | Offline | Module folder | This icon is displayed when a mismatch was detected between the system parameters and the property of a module. |
|  | Unconfirmed required settings | | Module parameter | This icon is displayed when the [Apply] button has never been clicked in the module parameter (network) setting screen that includes a required setting. |
|  | Unnecessary unused FB file/FUN file exists | <ul style="list-style-type: none">• When the conversion of any program is completed• When the online program change is completed• When the conversion of all programs is completed• When a project is opened | <ul style="list-style-type: none">• FB file• FUN file | <p>This icon is displayed when both of the following conditions are satisfied:</p> <ul style="list-style-type: none">• "FB/FUN File setting" in the CPU module is set.• Lower hierarchy data than the FB file or FUN file is all unused or no lower hierarchy data exists. |

Connection destination window

The connection destination window displays the connection destination for a programmable controller in a list format.

Window

Select [View] ⇒ [Docking Window] ⇒ [Connection Destination] ().




For setting methods of a connection destination, refer to the following:

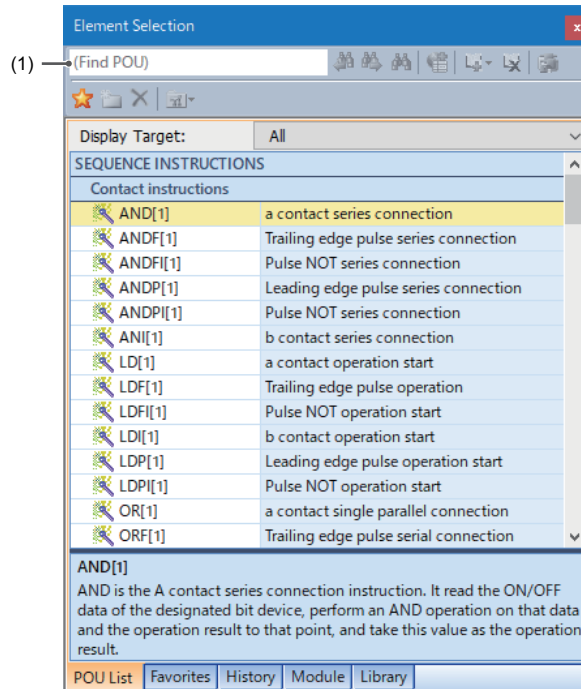
 Page 577 SETTING ROUTE TO CPU MODULE

Element selection window

The element selection window displays elements used for creating programs, such as instructions, standard functions, and function blocks, in a list format.

Window

Select [View] ⇒ [Docking Window] ⇒ [Element Selection] ().



(1): Toolbar

- By selecting a category from the pull-down list of "Display Target," only the elements in the category can be displayed.



Restriction

For Windows 11, when a personal computer returns from the sleep mode, the color of a part of the element selection window may change.

Searching for elements


Elements that include an entered keyword in their names or descriptions can be searched for.

Operating procedure

1. Enter a character string in the text box of the toolbar.
2. Click  (Previous)/ (Next).

The focus will move to an matching element.

Point


By clicking  (Find All) after entering a character string in the [POU List] tab, only the matching elements can be displayed.

Pasting elements

■Pasting elements in a program

When a program editor is active, elements which can be pasted are displayed in the element selection window. Elements can be pasted by dragging and dropping them from the list onto a program.

Point


For ST editor, the selected element is pasted at the cursor position by pressing the  key.

■Pasting objects on the module configuration diagram

When a module configuration diagram is active, elements which can be pasted are displayed in the element selection window. Elements can be pasted by dragging and dropping them from the list onto the module configuration diagram.

Favorites

Frequently used modules and elements/SFC elements (devices, labels, instructions, FB instances, functions) can be added in the [Favorites] tab for each category.

A new folder, which is for classification of elements, can be created by clicking  on the toolbar. The created folder can be moved by dragging and dropping and the folder name can also be changed.


When a module configuration diagram is active, only modules are displayed.

When a program editor is active, elements which can be used in the editor are displayed.

Operating procedure

■Adding elements from the element list

Modules, instructions, functions, and function blocks can be added to the [Favorites] tab.

1. Select an element to add from the list in the element selection window, and click  on the toolbar.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.

■Adding from the navigation window

Functions and function blocks can be added to the [Favorites] tab.

1. Select an element to add in the navigation window, and drag and drop it onto the element selection window.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.

■Adding from a ladder editor

Devices, labels, instructions, and FB instances can be added to the [Favorites] tab.

1. Select the cell of an element to add, and drag the border of the cell and drop it onto the element selection window.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.


■Adding from an ST editor

Devices, labels, and FB instances can be added to the [Favorites] tab.

1. Select the token of a part to add, and drag and drop it onto the element selection window.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.

■Adding from an FBD/LD editor

Devices, labels, and FB instances can be added to the [Favorites] tab.

1. Select an element to add, and drag and drop it onto the element selection window with the  key held down.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.

■Adding from an SFC diagram editor

Devices and labels can be added to the [Favorites] tab.

1. Select an SFC element to add, and drag and drop it onto the element selection window.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.

■Adding from a label editor

Labels can be added to the [Favorites] tab.

1. Select the line header of a label to add, and drag and drop it onto the element selection window.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.

■Adding from the "Label Comment" window


Labels can be added to the [Favorites] tab.

1. Select the name of a label to add, and drag and drop it onto the element selection window.
2. Select a registration destination in the "Add to Favorites" screen, and click the [OK] button.

■Adding templates classified by purpose

In GX Works3, templates classified by purpose are prepared for adding elements depending on the purpose to the [Favorites] tab at once.


By deleting unnecessary elements after templates are added, the elements can be placed efficiently.

1. Select the [Favorites] tab in the element selection window.
2. Select  on the toolbar in the element selection window ⇒ [Import to Favorites] ⇒ [Category by Target Template].

■Adding module templates

In GX Works3, module templates are prepared for adding frequently-used modules to the [Favorites] tab at once.

Module templates can be imported when a module configuration diagram is active.

1. Select the [Favorites] tab in the element selection window.
2. Select  on the toolbar in the element selection window ⇒ [Import to Favorites] ⇒ [Module Template].

Point

By importing an exported file (*.xml), elements registered in the [Favorites] tab can be used on other personal computers.

Select  on the toolbar ⇒ [Export Favorites]/[Import to Favorites]


History

By selecting the [History] tab, elements used previously are displayed in the order by date.
The order can be changed to the descending order of used count from the pull-down list.

Module

Module labels and module FBs, which are registered in a project, are displayed by selecting the [Module] tab.


For details on the registration methods, refer to the following:

 Page 258 Registering Module Labels, Page 521 Importing module FBs in a project

Library

POUs, which are registered in a library file, are displayed by selecting the [Library] tab.

For details on the registration methods, refer to the following:

 Page 532 Registering user libraries in the library list

2.4 Menu List

Basic menus

| [Project] | |
|---|--|
| ⇒ [New] | Page 105 Creating a project |
| ⇒ [Open] | Page 107 Opening a project |
| ⇒ [Close] | — |
| ⇒ [Save] | Page 130 Overwriting projects |
| ⇒ [Save As] | Page 129 Saving projects under the specified name |
| ⇒ [Delete] | Page 130 Deleting a project |
| ⇒ [Project Verify] | Page 151 Verifying Projects |
| ⇒ [Project Revision] ⇒ [Register Revision] | Page 168 Registering a revision |
| ⇒ [Project Revision] ⇒ [Revision List] | Page 170 Revision list screen |
| ⇒ [Change Module Type/Operation Mode] | Page 147 Changing the Module Type and Operation Mode of Projects |
| ⇒ [Data Operation] ⇒ [New Data] | Page 132 Creating data |
| ⇒ [Data Operation] ⇒ [Add New Worksheet] | Page 136 Adding worksheets |
| ⇒ [Data Operation] ⇒ [New Folder] | Page 56 Creating a user folder |
| ⇒ [Data Operation] ⇒ [Rename] | Page 133 Changing a data name |
| ⇒ [Data Operation] ⇒ [Delete Data] | Page 136 Deleting data |
| ⇒ [Data Operation] ⇒ [Copy Data] | Page 133 Copying and pasting data |
| ⇒ [Data Operation] ⇒ [Paste Data] | |
| ⇒ [Data Operation] ⇒ [Add New Module] | Page 214 Setting parameters of modules Page 227 Simple motion module setting function Page 227 Motion control setting function |
| ⇒ [Data Operation] ⇒ [Properties] | Page 143 Properties |
| ⇒ [Data Operation] ⇒ [Help] | Page 141 Associating data with a help file |
| ⇒ [Intelligent Function Module] ⇒ [Module Parameter List] | Page 222 Checking/changing the number of intelligent function module parameters |
| ⇒ [Open Other Format File] ⇒ [GX IEC Developer Format] ⇒ [Open ASC Format File] | Page 118 Opening a GX IEC Developer format project |
| ⇒ [Open Other Format File] ⇒ [GX IEC Developer Format] ⇒ [Open SUL Format User Library] | Page 530 Creating a GX Works3 format library from a GX IEC Developer format library |
| ⇒ [Open Other Format File] ⇒ [GX Works2 Format] ⇒ [Open Project] | Page 110 Opening a GX Works2 format project |
| ⇒ [Open Other Format File] ⇒ [GX Works2 Format] ⇒ [Open User Library] | Page 529 Creating a GX Works3 format library from a GX Works2 format library |
| ⇒ [Open Other Format File] ⇒ [GX Works3 Format] ⇒ [Open User Library] | Page 531 Editing libraries |
| ⇒ [Open Other Format File] ⇒ [PX Developer Format] ⇒ [Open Project] | Page 113 Opening a PX Developer format project |
| ⇒ [Open Other Format File] ⇒ [GX Developer Format] ⇒ [Open QSCPU Series Project] | Page 127 Opening a GX Developer format project |
| ⇒ [Import File] ⇒ [Simulink PLC Coder XML Format] | Page 137 Importing data (Simulink PLC Coder XML format) |
| ⇒ [Import File] ⇒ [IEC61131-10 XML Format] | Page 138 Importing data (IEC61131-10 XML format) |
| ⇒ [Library Operation] ⇒ [Export Library] | Page 528 Creating a library file |
| ⇒ [Library Operation] ⇒ [Register to Library List] ⇒ [User Library] | Page 532 Registering user libraries in the library list |
| ⇒ [Library Operation] ⇒ [Register to Library List] ⇒ [Library] | Page 536 Registering libraries of which file extensions are 'mslm' |
| ⇒ [Library Operation] ⇒ [Delete from Library List] | Page 532 Deleting libraries/updating display information |
| ⇒ [Library Operation] ⇒ [Update the Display Information of Library] | |
| ⇒ [Library Operation] ⇒ [Show Program/FB/FUN File] | Page 532 Displaying program files/FB files/FUN files |
| ⇒ [Library Operation] ⇒ [Update Library POU] | Page 535 Updating library POUs |
| ⇒ [Library Operation] ⇒ [Help] | Page 532 Displaying Help |
| ⇒ [Security] ⇒ [User Management] | Page 709 User management |
| ⇒ [Security] ⇒ [Change User Password] | Page 708 Changing a password of the logon user |

| [Project] | |
|--|--|
| ⇒ [Security] ⇒ [Security Key Setting] | Page 702 Registering a security key in a program file Page 705 Writing/deleting a security key to/from a CPU module |
| ⇒ [Security] ⇒ [Security Key Management] | Page 699 Creating/deleting a security key |
| ⇒ [Security] ⇒ [Block Password Setting] | Page 695 Setting a block password |
| ⇒ [Security] ⇒ [File Password Setting] | Page 720 Setting a file password |
| ⇒ [Printer Setup] | Page 93 Printing Data |
| ⇒ [Page Setup] | |
| ⇒ [Print Preview] | |
| ⇒ [Print] | |
| ⇒ [Recent Projects] ⇒ [(project path used recently 1 to 10)] | |
| ⇒ [Start GX Works2] | — |
| ⇒ [Exit] | Page 48 End |
| [Edit] | |
| ⇒ [Undo] | — |
| ⇒ [Redo] | |
| ⇒ [Cut] | |
| ⇒ [Copy] | |
| ⇒ [Paste] | |
| [Find/Replace] | |
| ⇒ [Cross Reference] | Page 472 Displaying cross reference information |
| ⇒ [Device List] | Page 480 Displaying Device Usage |
| ⇒ [Dataflow Analysis] | Page 482 Displaying a Range Affected by/Affecting a Device/Label |
| ⇒ [Unused Label List] | Page 478 Displaying a list of unused labels |
| ⇒ [Bookmark] | Page 500 Registering a Bookmark |
| ⇒ [Find Device/Label] | Page 463 Searching for/Replacing Devices and Labels |
| ⇒ [Find Instruction] | Page 465 Searching for/Replacing Instructions |
| ⇒ [Find Contact or Coil] | |
| ⇒ [Find String] | Page 466 Searching for/Replacing Character Strings |
| ⇒ [Replace Device/Label] | Page 463 Searching for/Replacing Devices and Labels |
| ⇒ [Replace Instruction] | Page 465 Searching for/Replacing Instructions |
| ⇒ [Replace Character String] | Page 466 Searching for/Replacing Character Strings |
| ⇒ [Change Open/Close Contact] | Page 468 Changing Contacts between Open Contact and Close Contact |
| ⇒ [Device Batch Replace] | Page 469 Batch Replacing of Devices and Labels |
| ⇒ [Register to Device Batch Replace] | — |
| ⇒ [Quick Find] | Page 146 Searching the Navigation Window |
| ⇒ [Previous] | — |
| ⇒ [Next] | |
| [Convert] | |
| ⇒ [Convert] | Page 432 Converting any or all programs |
| ⇒ [Online Program Change] | Page 620 Online program change |
| ⇒ [Rebuild All] | Page 432 Converting any or all programs |
| ⇒ [Check Syntax] ⇒ [Current POU] | Page 428 Syntax check |
| ⇒ [Check Syntax] ⇒ [ALL POUs] | |
| ⇒ [Converted Result] | Page 444 Displaying a converted result |
| ⇒ [Program File Setting] | Page 272 Program execution order setting |
| ⇒ [Worksheet Execution Order Setting] | Page 273 Worksheet execution order setting |
| ⇒ [Setting] | — |

| [View] | |
|--|--|
| ⇒ [Toolbar] ⇒ [Standard] | Page 50 Main frame |
| ⇒ [Toolbar] ⇒ [Program Common] | |
| ⇒ [Toolbar] ⇒ [Docking Window] | |
| ⇒ [Toolbar] ⇒ [Monitor Status] | |
| ⇒ [Toolbar] ⇒ [Process Control Extension] | |
| ⇒ [Statusbar] | |
| ⇒ [Color and Font] | Page 82 Checking and Changing Colors and Fonts |
| ⇒ [Docking Window] ⇒ [Navigation] | Page 53 Navigation window |
| ⇒ [Docking Window] ⇒ [Connection Destination] | Page 57 Connection destination window |
| ⇒ [Docking Window] ⇒ [Bookmark] | Page 500 Registering a Bookmark |
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| ⇒ [Docking Window] ⇒ [Progress] | — |
| ⇒ [Docking Window] ⇒ [Find/Replace] | |
| ⇒ [Docking Window] ⇒ [Find Results] | |
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| ⇒ [Docking Window] ⇒ [Device List] | Page 480 Displaying Device Usage |
| ⇒ [Docking Window] ⇒ [Dataflow Analysis] | Page 482 Displaying a Range Affected by/Affecting a Device/Label |
| ⇒ [Docking Window] ⇒ [Device Assignment Confirmation] | Page 219 Checking refresh devices assigned to a module |
| ⇒ [Docking Window] ⇒ [Converted Result] | Page 444 Displaying a converted result |
| ⇒ [Docking Window] ⇒ [Quick Find] | Page 79 Quick Search |
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| ⇒ [Docking Window] ⇒ [Guidance Flow] | |
| ⇒ [Docking Window] ⇒ [FB Property] | |
| ⇒ [Docking Window] ⇒ [Label Comment] | Page 253 Setting a label comment |
| ⇒ [Docking Window] ⇒ [Input the Configuration Detailed Information] | — |
| ⇒ [Docking Window] ⇒ [Result of Power Supply Capacity and I/O Points Check] | |
| ⇒ [Docking Window] ⇒ [Module Start I/O No. Related Area] | |
| ⇒ [Docking Window] ⇒ [(Watch 1 to 4)] | Page 658 Checking Current Values by Registering Devices/Labels |
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| ⇒ [Docking Window] ⇒ [Event History (Offline Monitor)] | Page 765 Checking Collected Data on Program Editor |
| ⇒ [Docking Window] ⇒ [Seek Bar (Offline Monitor)] | Page 781 Checking a device/label value |
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| ⇒ [Docking Window] ⇒ [Changed Point List(Offline Monitor)] | |
| ⇒ [Zoom] ⇒ [Set Zoom Factor] | |
| ⇒ [Zoom] ⇒ [Zoom In] | — |
| ⇒ [Zoom] ⇒ [Zoom Out] | |
| ⇒ [Zoom] ⇒ [Fit the editor width to the window width] | |
| ⇒ [Switch Display Language] | |
| ⇒ [Multiple Comments] ⇒ [Display Setting] | Page 49 Display Language Switching |
| ⇒ [Multiple Comments] ⇒ [Read Comment] | Page 83 Displaying and Reading Comments |
| [Online] | |
| ⇒ [Current Connection Destination] | Page 577 Specification of Connection Destination |
| ⇒ [Read from PLC] | Page 597 Writing/Reading Programmable Controller Data |
| ⇒ [Write to PLC] | |
| ⇒ [Verify with PLC] | Page 615 Verifying Programmable Controller Data |
| ⇒ [Remote Operation] | Page 789 Remote Operation |
| ⇒ [Safety PLC Operation] ⇒ [Check Safety Data Identity] | Page 797 Identification check for safety data |
| ⇒ [Safety PLC Operation] ⇒ [Switch Safety Operation Mode] | Page 794 Safety operation mode switching |

| [Online] | |
|---|--|
| ⇒ [Safety PLC Operation] ⇒ [Safety Module Operation] | Page 798 Safety module operation |
| ⇒ [Safety PLC Operation] ⇒ [Automatic Restore Setting] ⇒ [Enable] | Page 797 Automatic restoration setting |
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| ⇒ [Redundant PLC Operation] ⇒ [Redundant Operation] | Page 791 Redundant Programmable Controller Operations |
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| ⇒ [User Data] ⇒ [Read] | Page 627 Reading/Writing/Deleting User Data |
| ⇒ [User Data] ⇒ [Write] | |
| ⇒ [User Data] ⇒ [Delete] | |
| ⇒ [Set Clock] | Page 788 Clock Setting in a CPU Module |
| ⇒ [Monitor] ⇒ [Monitor Mode] | Page 280 Switching the ladder edit mode (read/write/monitor read/monitor write) |
| ⇒ [Monitor] ⇒ [Monitor (Write Mode)] | |
| ⇒ [Monitor] ⇒ [Start Monitoring (All Windows)] | Page 633 Starting/stopping monitoring |
| ⇒ [Monitor] ⇒ [Stop Monitoring (All Windows)] | |
| ⇒ [Monitor] ⇒ [Start Monitoring] | |
| ⇒ [Monitor] ⇒ [Stop Monitoring] | |
| ⇒ [Monitor] ⇒ [Change Value Format (Decimal)] | Page 633 Changing display format of word devices |
| ⇒ [Monitor] ⇒ [Change Value Format (Hexadecimal)] | |
| ⇒ [Monitor] ⇒ [Device/Buffer Memory Batch Monitor] | Page 654 Checking Device/Buffer Memory in a Batch |
| ⇒ [Monitor] ⇒ [Program List Monitor] | Page 677 Checking the Processing Time of a Program |
| ⇒ [Monitor] ⇒ [Interrupt Program List Monitor] | Page 679 Checking Execution Counts of Interrupt Programs |
| ⇒ [Monitor] ⇒ [SFC All Blocks Batch Monitoring] | Page 653 Monitoring all SFC blocks in batch/active steps |
| ⇒ [Monitor] ⇒ [SFC Auto-scroll] | Page 650 Monitoring with the SFC auto-scroll |
| ⇒ [Monitor] ⇒ [SFC Activated Step Monitor] | Page 651 Monitoring SFC steps which were activated |
| ⇒ [Monitor] ⇒ [Switch ST Monitor Display (All)] | Page 642 ST |
| ⇒ [Monitor] ⇒ [Switch ST Monitor Display (Bit Type Only)] | |
| ⇒ [FB Property Management (Online)] | Page 689 FB Property Management (Online) screen |
| ⇒ [Watch] ⇒ [Start Watching] | Page 658 Checking Current Values by Registering Devices/Labels |
| ⇒ [Watch] ⇒ [Stop Watching] | |
| ⇒ [Watch] ⇒ [Register to Watch Window] ⇒ [(Watch Window 1 to 4)] | |
| ⇒ [Watch] ⇒ [Batch Register to Watch Window] ⇒ [(Watch Window 1 to 4 (Batch Register))] | |
| ⇒ [User Authentication] ⇒ [Log on to PLC] | Page 715 Logging on to a CPU module |
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| ⇒ [Simulation] ⇒ [Start Simulation] | Page 542 Simulation |
| ⇒ [Simulation] ⇒ [Stop Simulation] | |
| ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Start System Simulation] | Page 544 System Simulation |
| ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation] | |
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|---|--|
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| ⇒ [Device Test with Execution Condition] ⇒ [Register] | Page 668 Changing Device/Label Value by Setting Conditions |
| ⇒ [Device Test with Execution Condition] ⇒ [Check/Disable Register] | |
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| ⇒ [Memory Dump] ⇒ [Setting] | Page 752 Memory Dump Function |
| ⇒ [Memory Dump] ⇒ [Read Results] | |
| ⇒ [Memory Dump] ⇒ [Display Result] | |
| ⇒ [Process Control Extension] ⇒ [Pause FB] | Page 672 Pausing/Restarting the Operation of Function Blocks |
| ⇒ [Process Control Extension] ⇒ [Restart FB] | |
| ⇒ [Process Control Extension] ⇒ [Paused FB List] | |
| [Recording] | |
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| ⇒ [Recording Setting] ⇒ [Edit] | |
| ⇒ [Read Recording File] | |
| ⇒ [Start Offline Monitor] ⇒ [Recording File] | Page 765 Checking Collected Data on Program Editor |
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| ⇒ [Start Offline Monitor] ⇒ [Memory Dump] | |
| ⇒ [Stop Offline Monitor] | |
| ⇒ [GOT Offline Monitor] ⇒ [Start] | |
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| ⇒ [Sensor/Device Monitor] | Page 730 Sensor/Device Status Check |
| ⇒ [Recording Monitor] | Page 732 Recording Status Check |
| ⇒ [Module Diagnostics (CPU Diagnostics)] | Page 733 Module Diagnostics |
| ⇒ [Ethernet Diagnostics] | Page 739 Ethernet diagnostics |
| ⇒ [CC-Link IE Control Diagnostics (Optical Cable)] | Page 740 CC-Link IE Controller Network diagnostics |
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| ⇒ [CC-Link IE TSN/CC-Link IE Field Diagnostics] | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| ⇒ [CC-Link IEF Basic Diagnostics] | Page 744 CC-Link IE Field Network Basic diagnostics |
| ⇒ [MELSECNET Diagnostics] | Page 745 MELSECNET diagnostics |
| ⇒ [CC-Link Diagnostics] | Page 746 CC-Link diagnostics |
| ⇒ [Simple CPU Communication Diagnostics] | Page 748 Simple CPU communication diagnostics |
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| ⇒ [Memory Card] ⇒ [Write to Memory Card] | |
| ⇒ [Check Program] | Page 429 Program check |
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| ⇒ [Check the Assigned Device of Global Label] | Page 251 Checking assigned devices |
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| ⇒ [Drive Tool List] | Page 226 Displaying the drive tool list |
| ⇒ [Predefined Protocol Support Function] | Page 228 Predefined Protocol Support Function |
| ⇒ [Circuit Trace] | Page 229 Circuit Trace Function |
| ⇒ [Update Firmware] | Page 806 Firmware Update |

| [Tool] | |
|--|---|
| ⇒ [Program Configuration Diagram] | Page 421 Checking/Editing the Relation between Programs |
| ⇒ [Profile Management] ⇒ [Register] | Page 194 Registration/update |
| ⇒ [Profile Management] ⇒ [Delete] | Page 194 Deletion |
| ⇒ [Register Simple Device Communication Library] | Page 225 Registering a simple device communication library |
| ⇒ [Configuration Management] ⇒ [Acquire Project] | Page 177 Acquiring a project |
| ⇒ [Configuration Management] ⇒ [Register Project] | Page 176 Registering a project |
| ⇒ [Configuration Management] ⇒ [Update Revision] | Page 178 Update Revision screen |
| ⇒ [Register Sample Library] | Page 536 Registering libraries of which file extensions are 'gx3s' |
| ⇒ [Process Control Extension] ⇒ [Setting] | Page 91 Process control extension setting |
| ⇒ [Process Control Extension] ⇒ [Tag FB Setting] | Page 260 Configuration of the tag FB setting editor |
| ⇒ [Process Control Extension] ⇒ [Program File Setting] | Page 274 Execution control of an FBD/LD program for process control |
| ⇒ [FB Property Management (Offline)] | Page 408 FB property management (offline) |
| ⇒ [Shortcut Key] | Page 81 Checking and Changing Shortcut Keys |
| ⇒ [Options] | Page 85 Option Settings for Each Function |
| [Window] | |
| ⇒ [Cascade] | — |
| ⇒ [Tile Vertically] | |
| ⇒ [Tile Horizontally] | |
| ⇒ [Arrange Icons] | |
| ⇒ [Close All Windows] | |
| ⇒ [Return Window Layout to Initial Status] | Page 50 Displaying docked windows |
| ⇒ [Split] | Page 320 Configuration of an ST editor Page 279 Splitting a ladder editor Page 413 Configuration of a device comment editor Page 449 Configuration of a Device Memory Editor |
| ⇒ [Restore Split] | — |
| ⇒ [Split Window Operation] ⇒ [Focus on Next Window] | |
| ⇒ [Split Window Operation] ⇒ [Focus on Previous Window] | |
| ⇒ [Split Window Operation] ⇒ [Synchronous Scrolling in Side by Side] | Page 279 Splitting a ladder editor |
| ⇒ [Floating] | Page 51 Docking/floating work windows |
| ⇒ [Docking] | |
| ⇒ [(Window information being displayed)] | — |
| ⇒ [Window] | Page 51 Arranging work windows |
| [Help] | |
| ⇒ [GX Works3 Help] | Page 42 Displaying Help |
| ⇒ [Connection to MITSUBISHI ELECTRIC FA Global Website] | Page 43 Connecting to MITSUBISHI ELECTRIC FA Global Website |
| ⇒ [Version Information] | Page 43 Checking the version of GX Works3 |

Available menus when editing a module configuration diagram

| [Edit] | |
|---|---|
| ⇒ [Delete] | — |
| ⇒ [Select All] | |
| ⇒ [Bring to Front] | |
| ⇒ [Send to Back] | |
| ⇒ [Module Status Setting (Empty)] | Page 199 Module status setting (empty) |
| ⇒ [Display Module Information] | Page 200 Displaying model names on module objects |
| ⇒ [XY Assignment Display] | Page 206 XY assignment display |
| ⇒ [Check] ⇒ [Power Supply Capacity and I/O Points] | Page 206 Checking the power supply capacity and I/O points |
| ⇒ [Check] ⇒ [System Configuration] | Page 206 Checking a system configuration |
| ⇒ [Parameter] ⇒ [Fix] | Page 201 Setting parameters on the module configuration diagram |
| ⇒ [Parameter] ⇒ [Detailed Configuration Information Input Window] | Page 201 Setting parameters on the module configuration diagram |
| ⇒ [Start XY Batch Input] | Page 206 Inputting the start XY in a batch |
| ⇒ [Default Points Batch Input] | Page 206 Inputting default points in a batch |
| [View] | |
| ⇒ [Toolbar] ⇒ [Module Configuration Diagram] | — |
| [Online] | |
| ⇒ [Read Module Configuration from PLC] | Page 199 Reading the module configuration from an actual system |

Available menus when displaying a program configuration diagram

| [Edit] | |
|--|---|
| ⇒ [Delete] | Page 426 Edit mode |
| ⇒ [Layout] ⇒ [Insert Row] | |
| ⇒ [Layout] ⇒ [Delete Row] | |
| ⇒ [Layout] ⇒ [Insert Column] | |
| ⇒ [Layout] ⇒ [Delete Column] | |
| ⇒ [Element] ⇒ [Program Block] | |
| ⇒ [Element] ⇒ [Function Block] | Page 422 Expanding/collapsing a block |
| ⇒ [Expand/Collapse All] ⇒ [Expand All Blocks] | |
| ⇒ [Expand/Collapse All] ⇒ [Collapse All Blocks] | — |
| ⇒ [Mode] ⇒ [Display Mode] | |
| ⇒ [Mode] ⇒ [Edit Mode] | Page 422 Updating a program configuration diagram |
| ⇒ [Update Configuration Diagram] | |
| ⇒ [Filter] | Page 422 Filtering a block |
| [View] | |
| ⇒ [Display Title] | Page 424 Data name and comment |
| ⇒ [Display Comment] | |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Open in Front] | Page 423 Displaying a label editor |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Tile Horizontally] | |
| ⇒ [Open Program Body of Selected Element] ⇒ [Open in Front] | Page 423 Displaying a program editor |
| ⇒ [Open Program Body of Selected Element] ⇒ [Tile Horizontally] | |

Available menus when displaying a parameter editor

| [Edit] | |
|--|---|
| ⇒ [Set Maximum Value] | The menus to be displayed differ depending on the module. |
| ⇒ [Set Minimum Value] | |
| ⇒ [Copy Positioning Data] | |
| ⇒ [Paste Positioning Data] | |
| ⇒ [Channel Copy] | |
| ⇒ [Copy Axis] | |
| ⇒ [Refresh Batch Setting] ⇒ [Enable All] | |
| ⇒ [Refresh Batch Setting] ⇒ [Disable All] | |
| ⇒ [Refresh Batch Setting] ⇒ [Back to User Default] | |
| ⇒ [Automatic Device Assignment] | |
| ⇒ [Setting Method] ⇒ [Start/End] | |
| ⇒ [Setting Method] ⇒ [Points/Start] | |
| ⇒ [Link Side Device Batch Setting] | |
| ⇒ [Auto-refresh Batch Setting] | |
| ⇒ [Points Batch Setting] | |
| ⇒ [Device Assignment Method] ⇒ [Start/End] | |
| ⇒ [Device Assignment Method] ⇒ [Points/Start] | |
| ⇒ [Word Device Setting Value Input Format] ⇒ [Decimal] | |
| ⇒ [Word Device Setting Value Input Format] ⇒ [Hexadecimal] | |
| ⇒ [IP Address Input Format] ⇒ [Decimal] | |
| ⇒ [IP Address Input Format] ⇒ [Hexadecimal] | |

Available menus when editing a ladder program

| [Edit] | |
|--|---|
| ⇒ [Image Clip] | Page 307 Copying an image to the clipboard |
| ⇒ [Continuous Paste] | Page 302 Pasting device numbers or label names consecutively |
| ⇒ [Insert and Paste] | Page 301 Pasting |
| ⇒ [Delete] | — |
| ⇒ [Switch Overwrite/Insert mode] | — |
| ⇒ [Set the Status Back to the One at the Start of Editing] | Page 303 Returning ladder diagrams to the condition before editing |
| ⇒ [Insert Row] | — |
| ⇒ [Delete Row] | — |
| ⇒ [Insert Column] | — |
| ⇒ [Delete Column] | — |
| ⇒ [NOP Batch Insert] | Page 300 Inserting/deleting NOP instruction |
| ⇒ [NOP Batch Delete] | — |
| ⇒ [Change TC Setting Value] | Page 300 Changing TC setting values |
| ⇒ [Ladder Edit Mode] ⇒ [Read Mode] | Page 280 Switching the ladder edit mode (read/write/monitor read/monitor write) |
| ⇒ [Ladder Edit Mode] ⇒ [Write Mode] | |
| ⇒ [Ladder Edit Mode] ⇒ [Read Mode (All Windows)] | |
| ⇒ [Ladder Edit Mode] ⇒ [Write Mode (All Windows)] | |
| ⇒ [Ladder Edit Mode] ⇒ [Read Mode (All Ladder Programs Elements)] | |
| ⇒ [Ladder Edit Mode] ⇒ [Write Mode (All Ladder Programs Elements)] | — |
| ⇒ [Edit Mode] ⇒ [Use Assigned Device for Label Input] | Page 282 Displaying a global label entered by using an assigned device |

| [Edit] | |
|---|--|
| ⇒ [Ladder Symbol] ⇒ [Open Contact] | Page 281 Inserting from the menu or on the toolbar |
| ⇒ [Ladder Symbol] ⇒ [Close Contact] | |
| ⇒ [Ladder Symbol] ⇒ [Open Branch] | |
| ⇒ [Ladder Symbol] ⇒ [Close Branch] | |
| ⇒ [Ladder Symbol] ⇒ [Coil] | |
| ⇒ [Ladder Symbol] ⇒ [Application Instruction] | |
| ⇒ [Ladder Symbol] ⇒ [Vertical Line] | |
| ⇒ [Ladder Symbol] ⇒ [Horizontal Line] | |
| ⇒ [Ladder Symbol] ⇒ [Delete Vertical Line] | |
| ⇒ [Ladder Symbol] ⇒ [Delete Horizontal Line] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Branch] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Branch] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Close] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Close] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Close Branch] | |
| ⇒ [Ladder Symbol] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Close Branch] | |
| ⇒ [Ladder Symbol] ⇒ [Invert Operation Results] | — |
| ⇒ [Ladder Symbol] ⇒ [Operation Result Rising Pulse] | |
| ⇒ [Ladder Symbol] ⇒ [Operation Result Falling Pulse] | |
| ⇒ [Inline Structured Text] ⇒ [Insert Inline Structured Text Box] | Page 292 Inserting an inline structured text box |
| ⇒ [Inline Structured Text] ⇒ [Display Template] | Page 326 Displaying syntax templates |
| ⇒ [Inline Structured Text] ⇒ [Mark Template (Left)] | |
| ⇒ [Inline Structured Text] ⇒ [Mark Template (Right)] | |
| ⇒ [Inline Structured Text] ⇒ [Register Label] | Page 326 Registering an undefined label |
| ⇒ [Inline Structured Text] ⇒ [Comment Out of Selected Range] | Page 325 Batch comment out/uncomment of a program |
| ⇒ [Inline Structured Text] ⇒ [Disable Comment Out of Selected Range] | |
| ⇒ [Create FB] | Page 510 Creating a function block from an existing ladder block |
| ⇒ [Edit FB Instance] | Page 285 Changing an FB instance name |
| ⇒ [Change FB/FUN Data] | Page 286 Replacing an FB instance Page 291 Replacing functions |
| ⇒ [Update FB/FUN] | Page 288 Function block whose definition is unclear Page 291 Function whose definition is unclear |
| ⇒ [I/O Argument] ⇒ [Increment Argument] | Page 290 Adding/deleting arguments |
| ⇒ [I/O Argument] ⇒ [Delete Argument] | |
| ⇒ [Documentation] ⇒ [Edit Device/Label Comment] | Page 295 Entering/editing comments |
| ⇒ [Documentation] ⇒ [Edit Statement] | Page 296 Entering/editing statements |
| ⇒ [Documentation] ⇒ [Edit Note] | Page 299 Entering/editing notes |
| ⇒ [Documentation] ⇒ [Delete Device/Label Comment] | — |
| ⇒ [Documentation] ⇒ [Statement/Note Batch Edit] | Page 296 Entering/editing statements Page 299 Entering/editing notes |
| ⇒ [Documentation] ⇒ [Show/Hide of Navigation Window] | Page 298 Line statement to be displayed in the navigation window |
| ⇒ [Easy Edit] ⇒ [Connect Horizontal Line to Right-Side Ladder Symbol] | — |
| ⇒ [Easy Edit] ⇒ [Connect Horizontal Line to Left-Side Ladder Symbol] | |
| ⇒ [Easy Edit] ⇒ [Enter/Delete Horizontal Line to Rightward] | |
| ⇒ [Easy Edit] ⇒ [Enter/Delete Horizontal Line to Leftward] | |
| ⇒ [Easy Edit] ⇒ [Enter/Delete Vertical Line to Downward] | |
| ⇒ [Easy Edit] ⇒ [Enter/Delete Vertical Line to Upward] | |
| ⇒ [Easy Edit] ⇒ [Switch Ladder Symbol Invert] | |
| ⇒ [Easy Edit] ⇒ [Switch Pulse/Switch SET and RST Instruction] | Page 282 Switching methods for contacts/instructions |

| [Edit] | |
|--|---|
| ⇒ [Easy Edit] ⇒ [Switch Statement/Note Type] | — |
| ⇒ [Easy Edit] ⇒ [Instruction Partial Edit] | — |
| ⇒ [Temporarily Change Ladders] ⇒ [Temporarily Change Ladders] | Page 304 Temporary changing |
| ⇒ [Temporarily Change Ladders] ⇒ [Restore the Changes] | Page 305 Applying/restoring the changes |
| ⇒ [Temporarily Change Ladders] ⇒ [Apply the Changes] | — |
| ⇒ [Temporarily Change Ladders] ⇒ [Temporarily Changed Ladder List] | Page 305 Displaying ladder blocks changed temporarily in a list |
| ⇒ [Import File] | Page 308 Importing/exporting ladder programs |
| ⇒ [Export to File] | Page 308 Importing/exporting ladder programs |
| [Find/Replace] | |
| ⇒ [Line Statement List] | Page 297 Displaying a list |
| ⇒ [Jump] | Page 307 Jump |
| ⇒ [Jump to Next Ladder Block Start] | — |
| ⇒ [Jump to Previous Ladder Block Start] | — |
| ⇒ [Inline Structured Text] ⇒ [Incremental Search] ⇒ [Search Down] | Page 328 Incremental search |
| ⇒ [Inline Structured Text] ⇒ [Incremental Search] ⇒ [Search Up] | — |
| [View] | |
| ⇒ [Toolbar] ⇒ [Ladder] | — |
| ⇒ [Comment Display] | Page 295 Entering/editing comments |
| ⇒ [Statement Display] | Page 296 Entering/editing statements |
| ⇒ [Note Display] | Page 299 Entering/editing notes |
| ⇒ [Comment/Statement/Note Batch Display] | Page 295 Entering/editing comments Page 296 Entering/editing statements Page 299 Entering/editing notes |
| ⇒ [Display Lines of Monitored Current Value] | — |
| ⇒ [Grid Display] | — |
| ⇒ [Display Format for Device Comment] | — |
| ⇒ [Change Display Format of Device/Label Name] ⇒ [1 Cell Display] | Page 276 Configuration of a ladder editor |
| ⇒ [Change Display Format of Device/Label Name] ⇒ [Wrapping Ladder Display] | — |
| ⇒ [Display Setting of Label Name] ⇒ [Display from the Start] | — |
| ⇒ [Display Setting of Label Name] ⇒ [Display from the End] | — |
| ⇒ [Display Setting of Label Name] ⇒ [Member is Prioritized to Display] | — |
| ⇒ [Outline] ⇒ [Expand/Collapse of Outlines] | — |
| ⇒ [Outline] ⇒ [Expand/Collapse of All Outlines] | — |
| ⇒ [Outline] ⇒ [Show/Hide of Outlines] | Page 276 Configuration of a ladder editor |
| ⇒ [Display Device] | — |
| ⇒ [Text Size] ⇒ [Bigger] | — |
| ⇒ [Text Size] ⇒ [Smaller] | — |
| ⇒ [Text Size] ⇒ [Autofit] | Page 276 Configuration of a ladder editor |
| ⇒ [Height Setting of Inline Structured Text] | Page 293 Changing the number of rows to display |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Open in Front] | — |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Tile Horizontally] | — |
| ⇒ [Open Program Body of Selected Element] ⇒ [Open in Front] | — |
| ⇒ [Open Program Body of Selected Element] ⇒ [Tile Horizontally] | — |
| ⇒ [Open Label Setting] ⇒ [Open in Front] | — |
| ⇒ [Open Label Setting] ⇒ [Tile Horizontally] | — |
| ⇒ [Open Device Comment Setting] ⇒ [Open in Front] | Page 414 Displaying a device comment editor from a program editor |
| ⇒ [Open Device Comment Setting] ⇒ [Tile Horizontally] | — |
| ⇒ [Open Zoom Source Block] | Page 381 Creating/displaying Zooms (action/transition) |
| ⇒ [Instruction Help] | Page 307 Displaying instruction help |

Available menus when editing an ST program

| [Edit] | |
|--|---|
| ⇒ [Delete] | — |
| ⇒ [Switch Insert/Overwrite mode] | Page 320 Configuration of an ST editor |
| ⇒ [Move Selected Lines Up] | — |
| ⇒ [Move Selected Lines Down] | |
| ⇒ [Comment Out of the Selected Range] | Page 325 Batch comment out/uncomment of a program |
| ⇒ [Disable Comment Out of Selected Range] | |
| ⇒ [Register Label] | Page 326 Registering an undefined label |
| ⇒ [Display Template] | Page 326 Displaying syntax templates |
| ⇒ [Mark Template (Left)] | |
| ⇒ [Mark Template (Right)] | |
| [Find/Replace] | |
| ⇒ [Jump] | Page 328 Jump |
| ⇒ [Incremental Search] ⇒ [Search Down] | Page 328 Incremental search |
| ⇒ [Incremental Search] ⇒ [Search Up] | |
| [View] | |
| ⇒ [Toolbar] ⇒ [ST] | — |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Open in Front] | |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Tile Horizontally] | |
| ⇒ [Open Program of Selected Element] ⇒ [Open in Front] | |
| ⇒ [Open Program of Selected Element] ⇒ [Tile Horizontally] | |
| ⇒ [Open Label Setting] ⇒ [Open in Front] | |
| ⇒ [Open Label Setting] ⇒ [Tile Horizontally] | |
| ⇒ [Open Device Comment Setting] ⇒ [Open in Front] | Page 414 Displaying a device comment editor from a program editor |
| ⇒ [Open Device Comment Setting] ⇒ [Tile Horizontally] | Page 381 Creating/displaying Zooms (action/transition) |
| ⇒ [Open Zoom Source Block] | |
| ⇒ [Switch Between Worksheets] ⇒ [Switch to Previous Worksheet] | — |
| ⇒ [Switch Between Worksheets] ⇒ [Switch to Next Worksheet] | |
| ⇒ [Outline] ⇒ [Expand/Collapse of Outlines] | |
| ⇒ [Outline] ⇒ [Expand/Collapse of All Outlines] | |
| ⇒ [Outline] ⇒ [Show/Hide of Outlines] | Page 320 Configuration of an ST editor |

Available menus when editing an FBD/LD program

| [Edit] | |
|--|--|
| ⇒ [Delete] | — |
| ⇒ [Select FBD Network Block] | Page 339 Common operations of elements |
| ⇒ [Layout] ⇒ [Insert Row] | Page 346 Inserting a row |
| ⇒ [Layout] ⇒ [Delete Row] | Page 346 Deleting a row |
| ⇒ [Layout] ⇒ [Insert Column(in FBD Network Block)] | Page 346 Inserting/deleting a column |
| ⇒ [Layout] ⇒ [Delete Column(in FBD Network Block)] | |
| ⇒ [Layout] ⇒ [Insert Multiple Rows] | Page 346 Inserting multiple rows |
| ⇒ [Layout] ⇒ [Delete Multiple Rows] | Page 346 Deleting multiple rows |
| ⇒ [Layout] ⇒ [Layout Correction in FBD Network Block] | Page 346 Correcting layout in an FBD network block |
| ⇒ [Layout] ⇒ [Batch Correction of Layout in FBD Network Block] | Page 346 Correcting layout in an FBD network block in a batch |
| ⇒ [Layout] ⇒ [Delete the Blank Row Between FBD Network Blocks] | Page 346 Deleting a blank row between FBD network blocks |
| ⇒ [Layout] ⇒ [Batch Alignment of All FBD Network Blocks to the Left] | Page 346 Aligning FBD network blocks to the left side in a batch |
| ⇒ [Layout] ⇒ [Batch Correct All FBD/LD Editors] | Page 346 Correcting the layout of all FBD/LD editors in a batch |

| [Edit] | |
|---|--|
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Open Contact] | Page 336 Inserting from the menu or on the toolbar |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Close Contact] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Open Branch] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Close Branch] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Coil] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Left Power Rail] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Branch] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Branch] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Close] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Close] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Close Branch] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Close Branch] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Open Contact and Coil] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Variable] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Connector] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Jump] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Jump Label] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Return] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Inline Structured Text] | |
| ⇒ [Add Element (Ladder Symbol)] ⇒ [Comment] | |
| ⇒ [Change Name] | — |
| ⇒ [Toggle FB/FUN Height] ⇒ [Adapt Width] | Page 345 Changing the height of an element |
| ⇒ [Toggle FB/FUN Height] ⇒ [Keep Width] | |
| ⇒ [Change FB/FUN Data] | Page 341 Replacing function elements/function block elements |
| ⇒ [Update FB/FUN] | Page 343 FB/FUN whose definition is unclear |
| ⇒ [Edit Mode] ⇒ [Element Auto-connect] | Page 339 Common operations of elements |
| ⇒ [Edit Mode] ⇒ [Use Assigned Device for Label Input] | Page 336 Entering programs |
| ⇒ [I/O Argument] ⇒ [Increment Argument] | Page 341 Adding/deleting arguments |
| ⇒ [I/O Argument] ⇒ [Delete Argument] | |
| ⇒ [I/O Argument] ⇒ [Mark as Hidden] | Page 342 Hiding arguments |
| ⇒ [I/O Argument] ⇒ [Unmark as Hidden] | |
| ⇒ [I/O Argument] ⇒ [Hide Argument] | |
| ⇒ [I/O Argument] ⇒ [Show Argument] | |
| ⇒ [Easy Edit] ⇒ [Invert Contact (Open/Close)] | Page 337 Switching methods for contacts/instructions |
| ⇒ [Easy Edit] ⇒ [Switch Pulse] | |
| ⇒ [Easy Edit] ⇒ [Switch SET and RST] | |
| ⇒ [Easy Edit] ⇒ [Link Comment] | Page 349 Linking a comment element with a single element |
| ⇒ [Easy Edit] ⇒ [Unlink Comment] | Page 349 Releasing links |
| ⇒ [Easy Edit] ⇒ [Comment Batch Link] | Page 350 Linking comment elements and elements in a batch |
| ⇒ [Order Comment] ⇒ [Bring to Front] | Page 345 Order of comment elements |
| ⇒ [Order Comment] ⇒ [Bring Forward] | |
| ⇒ [Order Comment] ⇒ [Send Backward] | |
| ⇒ [Order Comment] ⇒ [Send to Back] | |
| ⇒ [Process Control Extension] ⇒ [Add Structured Data Type Label for Tag Data Reference] | Page 518 Creating a user-defined tag FB |
| [Find/Replace] | |
| ⇒ [FBD Network Block List] | Page 351 Displaying FBD network blocks in a list |
| [View] | |
| ⇒ [Toolbar] ⇒ [FBD/LD] | — |

| [View] | |
|--|---|
| ⇒ [Comment Display] ⇒ [Device/Label Comment] | Page 330 Configuration of an FBD/LD editor |
| ⇒ [Comment Display] ⇒ [Switch FB/FUN Argument] | |
| ⇒ [Device Display] | |
| ⇒ [FBD Network Block No. Display] | |
| ⇒ [Display Execution Order] | |
| ⇒ [Grid Display] | |
| ⇒ [Display Page Break] | |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Open in Front] | — |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Tile Horizontally] | |
| ⇒ [Open Program Body of Selected Element] ⇒ [Open in Front] | |
| ⇒ [Open Program Body of Selected Element] ⇒ [Tile Horizontally] | |
| ⇒ [Open Label Setting] ⇒ [Open in Front] | |
| ⇒ [Open Label Setting] ⇒ [Tile Horizontally] | Page 414 Displaying a device comment editor from a program editor |
| ⇒ [Open Device Comment Setting] ⇒ [Open in Front] | |
| ⇒ [Open Device Comment Setting] ⇒ [Tile Horizontally] | Page 381 Creating/displaying Zooms (action/transition) |
| ⇒ [Open Zoom Source Block] | |
| ⇒ [Switch Between Worksheets] ⇒ [Switch to Previous Worksheet] | |
| ⇒ [Switch Between Worksheets] ⇒ [Switch to Next Worksheet] | — |
| [Online] | |
| ⇒ [Monitor] ⇒ [Faceplate] | Page 684 Checking tag data on the gauge window (faceplate) |

Available menus when editing an SFC program (SFC diagram)

| [Edit] | |
|---|---|
| ⇒ [Delete] | — |
| ⇒ [Select SFC Network Block] | Page 370 Common operations of SFC elements |
| ⇒ [Change TC Setting Value] | Page 300 Changing TC setting values |
| ⇒ [Modify] ⇒ [Name] | Page 362 Changing a step name/step No./step attribute/step attribute target Page 364 Changing a transition name/Transition No. |
| ⇒ [Modify] ⇒ [Direct Expression for Transition] | Page 365 Creating a transition |
| ⇒ [Modify] ⇒ [Qualifier] | — |
| ⇒ [Modify] ⇒ [End Step/Jump] | Page 357 SFC elements |
| ⇒ [Modify] ⇒ [Step Attribute] | Page 362 Changing a step name/step No./step attribute/step attribute target |
| ⇒ [Modify] ⇒ [No Step Attribute] | |
| ⇒ [Modify] ⇒ [SC: Coil HOLD Step] | |
| ⇒ [Modify] ⇒ [SE: Operation HOLD Step (without Transition Check)] | |
| ⇒ [Modify] ⇒ [ST: Operation HOLD Step (with Transition Check)] | |
| ⇒ [Modify] ⇒ [R: Reset Step] | |
| ⇒ [Modify] ⇒ [BC: Block Start Step (with END Check)] | |
| ⇒ [Modify] ⇒ [BS: Block Start Step (without END Check)] | |
| ⇒ [Modify] ⇒ [Step Attribute Target] | |
| ⇒ [Modify] ⇒ [Device] | |
| ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line] | Page 367 Switching a jump/connection line |
| ⇒ [Modify] ⇒ [Toggle Transition Size] | Page 366 Entering comments of Transition No. |
| ⇒ [Insert] ⇒ [Step] | Page 362 Inserting a normal step |
| ⇒ [Insert] ⇒ [Transition] | Page 364 Inserting a transition |
| ⇒ [Insert] ⇒ [Action] | Page 366 Inserting an action |
| ⇒ [Insert] ⇒ [Jump] | Page 367 Inserting a jump |
| ⇒ [Insert] ⇒ [Selection Branch] | Page 369 Inserting a branch below a step/transition |
| ⇒ [Insert] ⇒ [Simultaneous Branch] | |

| [Edit] | |
|---|--|
| ⇒ [Insert] ⇒ [Selection Branch Leg] | Page 369 Adding a selection branch on the right side of a transition/selection condition |
| ⇒ [Insert] ⇒ [Simultaneous Branch Leg] | Page 369 Adding a simultaneous branch on the right side of a step/simultaneous branch |
| ⇒ [Insert FBD/LD Element] ⇒ [Left Power Rail] | — |
| ⇒ [Insert FBD/LD Element] ⇒ [Open Contact] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Close Contact] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Open Branch] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Close Branch] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Branch] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Branch] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Close] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Close] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Rising Pulse Close Branch] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Pulse Contact Symbol] ⇒ [Falling Pulse Close Branch] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Variable] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Connector] | |
| ⇒ [Insert FBD/LD Element] ⇒ [Comment] | |
| ⇒ [Edit Mode] ⇒ [Element Auto-connect] | |
| ⇒ [I/O Argument] ⇒ [Increment Argument] | Page 341 Adding/deleting arguments |
| ⇒ [I/O Argument] ⇒ [Delete Argument] | |
| ⇒ [Easy Edit] ⇒ [Invert Contact (Open/Close)] | Page 337 Switching methods for contacts/instructions |
| ⇒ [Easy Edit] ⇒ [Switch Pulse] | |
| ⇒ [Easy Edit] ⇒ [Link Comment] | Page 349 Linking a comment element with a single element Page 380 Linking a comment |
| ⇒ [Easy Edit] ⇒ [Unlink Comment] | Page 349 Releasing links |
| ⇒ [Easy Edit] ⇒ [Comment Batch Link] | Page 350 Linking comment elements and elements in a batch |
| ⇒ [Order Comment] ⇒ [Bring to Front] | Page 345 Order of comment elements |
| ⇒ [Order Comment] ⇒ [Bring Forward] | |
| ⇒ [Order Comment] ⇒ [Send Backward] | |
| ⇒ [Order Comment] ⇒ [Send to Back] | |
| ⇒ [Edit Step/Transition] | Page 380 Editing Step No./Transition No. |
| ⇒ [Change Type of Transition] | Page 359 Changing the display format (type) of a transition |
| ⇒ [Properties] | — |
| [Convert] | |
| ⇒ [Convert Block] | Page 380 Converting a block |
| [View] | |
| ⇒ [Toolbar] ⇒ [SFC] | — |
| ⇒ [Comment Display] | Page 354 Configuration of an SFC diagram editor |
| ⇒ [Device Display] | |
| ⇒ [Display Step/Transition] | |
| ⇒ [Switch Ladder Display] ⇒ [Detailed Expression] | |
| ⇒ [Switch Ladder Display] ⇒ [MELSA-P-L (Instruction Format)] | |
| ⇒ [Grid Display] | |
| ⇒ [Hide Actions] | |
| ⇒ [Open SFC Block List] | Page 384 Displaying an SFC block list |
| ⇒ [Open Zoom List] | Page 383 Displaying a Zoom list |

| [View] | |
|--|---|
| ⇒ [Open Label Setting of Selected Element] ⇒ [Open in Front] | — |
| ⇒ [Open Label Setting of Selected Element] ⇒ [Tile Horizontally] | |
| ⇒ [Open Program Body of Selected Element] ⇒ [Open in Front] | |
| ⇒ [Open Program Body of Selected Element] ⇒ [Tile Horizontally] | |
| ⇒ [Open Label Setting] ⇒ [Open in Front] | |
| ⇒ [Open Label Setting] ⇒ [Tile Horizontally] | |
| ⇒ [Open Device Comment Setting] ⇒ [Open in Front] | Page 414 Displaying a device comment editor from a program editor |
| ⇒ [Open Device Comment Setting] ⇒ [Tile Horizontally] | |
| ⇒ [Open Zoom/Start Destination Block] | Page 354 Configuration of an SFC diagram editor |
| ⇒ [Open Start Source Block] | Page 363 Creating a step that makes another block activated |

| [Debug] | |
|--|-------------------------------------|
| ⇒ [Control SFC Steps] ⇒ [Activate the Selected Steps] | Page 652 Changing the active status |
| ⇒ [Control SFC Steps] ⇒ [Deactivate the Selected Steps] | |
| ⇒ [Control SFC Steps] ⇒ [Activate the Selected Steps Only] | |

Available menus when editing an SFC program (block list)

| [Edit] | |
|------------|---|
| ⇒ [Delete] | — |

| [Find/Replace] | |
|-----------------------------------|--|
| ⇒ [Jump] | Page 385 Jump |
| ⇒ [Block Information Find Device] | Page 385 Searching for block information |

| [View] | |
|----------------------------|--|
| ⇒ [SFC Block List Comment] | Page 384 Displaying an SFC block list |
| ⇒ [Display Device] | |
| ⇒ [Open SFC Body] | Page 384 Displaying SFC diagrams |
| ⇒ [Open Label Setting] | Page 385 Displaying local label editor |

Available menus when displaying a label editor

| [Edit] | |
|---|--|
| ⇒ [Delete] | — |
| ⇒ [Select All] | |
| ⇒ [New Declaration (Before)] | Page 237 Editing a row |
| ⇒ [New Declaration (After)] | |
| ⇒ [Delete Row] | |
| ⇒ [Import File] | Page 255 Exporting/importing a label |
| ⇒ [Export to File] | |
| ⇒ [System Label] ⇒ [Reservation to Register System Label] | Page 266 Registering labels in system label database |
| ⇒ [System Label] ⇒ [Reservation to Release System Label] | Page 266 Releasing system labels |
| ⇒ [System Label] ⇒ [Import System Label] | Page 266 Importing system labels in system label database to GX Works3 |
| ⇒ [System Label] ⇒ [Reflect to System Label Database] | Page 266 Registering labels in system label database |
| ⇒ [System Label] ⇒ [Check the changes of the System Label Database] | Page 267 Importing the changes of system label database |
| ⇒ [System Label] ⇒ [Execute Verification Synchronous with System Label] | Page 267 Verifying system label information |
| ⇒ [Copy Device Comment] | Page 249 Copying a device comment |
| ⇒ [Delete Blank Rows] | Page 237 Deleting a blank row |
| ⇒ [Duplicate Structured Data Type Label] | Page 242 Duplicating a structure type global label |
| [View] | |
| ⇒ [Toolbar] ⇒ [Label] | — |
| ⇒ [Show/Hide of Label Item] | |
| ⇒ [Display Program Editor] | |
| ⇒ [Open Label Comment setting] | Page 235 Configuration of a label editor |

Available menus when displaying a device memory editor

| [Edit] | |
|--|--|
| ⇒ [Delete] | — |
| ⇒ [Enter Character String] | Page 452 Setting character strings |
| ⇒ [Clear All (All Devices)] | Page 452 Clearing whole memory of device memory |
| ⇒ [Clear All (Displayed Devices)] | |
| ⇒ [FILL] | Page 451 Setting values in batch |
| ⇒ [Register/Import Device Initial Value] | Page 453 Linkage with initial device values |
| ⇒ [Import to File] | Page 455 Importing device memory data |
| ⇒ [Export to File] | Page 454 Exporting device memory data |
| [View] | |
| ⇒ [Toolbar] ⇒ [Device Memory] | — |
| ⇒ [Display Format Detailed Setting] | |
| [Online] | |
| ⇒ [Device Memory] ⇒ [Read Selected Range] | Page 453 Writing/Reading Data to/from CPU Module |
| ⇒ [Device Memory] ⇒ [Write Selected Range] | |

Available menus when editing a device comment

| [Edit] | |
|--|--|
| ⇒ [Delete] | — |
| ⇒ [Select All] | |
| ⇒ [Detect the Mismatched Comment] | Page 415 Detecting devices with empty cell |
| ⇒ [Read from Sample Comment] | Page 420 Reading sample comments |
| ⇒ [Delete Unused Device Comment] | Page 417 Deleting unused device comments |
| ⇒ [Clear All (All Devices)] | Page 417 Clearing all device comments |
| ⇒ [Clear All (Displayed Devices)] | |
| ⇒ [Import File] | Page 418 Exporting/importing device comments |
| ⇒ [Export to File] | |
| ⇒ [Hide All Bit Specification Information] | — |
| ⇒ [Show All Bit Specification Information] | |
| ⇒ [Hide All Linefeed Comments] | |
| ⇒ [Show All Linefeed Comments] | |
| ⇒ [Cut the Range Including Hidden Bit Specification Information] | Page 415 Creating device comments |
| ⇒ [Copy the Range Including Hidden Bit Specification Information] | |
| ⇒ [Paste the Range Including Hidden Bit Specification Information] | |

Available menus when displaying the verify result window

| [Edit] | |
|-------------------------------|---|
| ⇒ [Export to File] | Page 153 Checking a verification result |
| [Find/Replace] | |
| ⇒ [Next Mismatch] | Page 153 Checking a verification result |
| ⇒ [Previous Mismatch] | |
| [View] | |
| ⇒ [Toolbar] ⇒ [Verify Result] | — |
| ⇒ [Return to Result List] | |
| ⇒ [Close Detailed Result] | |
| ⇒ [Close All Detailed Result] | |
| ⇒ [Show only Mismatches] | Page 153 Checking a verification result |

Available menus when displaying the device/buffer memory batch monitor window

| [View] | |
|--|---|
| ⇒ [Toolbar] ⇒ [Device/Buffer Memory Batch Monitor] | — |
| ⇒ [Display Format Detailed Setting] | |

Available menus when displaying the tag FB setting editor

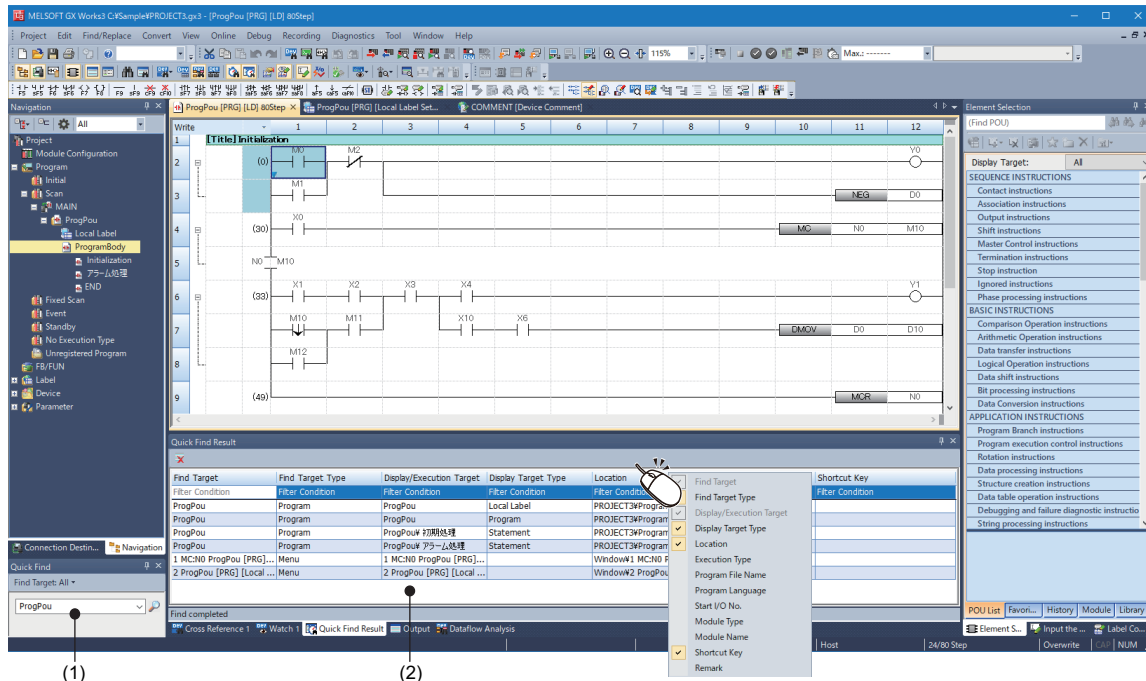
| [Edit] | |
|---|--|
| ⇒ [Delete] | — |
| ⇒ [Select All] | |
| ⇒ [New Declaration (Before)] | |
| ⇒ [Delete Row] | |
| ⇒ [Export Assignment Information Database File] | |
| ⇒ [FB Property Page] | Page 389 Displaying the FB property page |

2.5 Quick Search

The quick search is a function to search for a specified keyword in GX Works3, and to display or execute a result.

Window

Select [Find/Replace] ⇒ [Quick Find] (🔍).



(1) Quick find window

(2) Quick find result window

Operating procedure

1. Enter a search keyword in the input field of the "Quick Find" window (1).
2. Click 🔍.
3. Double-click a search result displayed in the "Quick Find Result" window (2).

The selected data is displayed, or the selected menu is executed.

Point

- By selecting a search target category from the pull-down list of the "Quick Find" window (1), the only selected category can be targeted for searching.
- By pressing the **[Shift]** + **[Enter]** keys or double-clicking a search result with the **[Shift]** key held down in the "Quick Find Result" window (2), jumping to the data or executing the menu is possible while the cursor remains in the "Quick Find Result" window (2).

Search targets

The following table shows the targets of quick search.

| Target | Description |
|-------------------|--|
| Navigation window | Data in the navigation window can be searched for. |
| Menu | <p>Menus can be searched for.</p> <p>Search results may differ depending on the editor that is active in searching.</p> <p>In addition, when searching with a function name of an existing MELSOFT application, the similar function of GX Works3 can be displayed.</p> <p>If an existing MELSOFT application has a function similar to the displayed function, the application name is displayed in the "Remark" column. To display the "Remark" column, right-click on the column header and select [Remark] from the shortcut menu.</p> <p>The applicable existing MELSOFT applications are as follows:</p> <ul style="list-style-type: none">• GX Works2• PX Developer• GX Developer |

Filtering display

The displayed search results can be filtered.

Operating procedure

Enter or select a filtering condition in the "Quick Find Result" window (2), and press the  key.

■Filtering condition

The previously entered keywords or search results can be selected from the pull-down list.

■Deleting a filtering condition

Filtering of a column can be cleared by deleting the keyword entered as a filtering condition for the column.

■Keywords for a filtering condition

A wild card '*' can be set as a filtering condition.

Sorting display

The columns can be sorted in ascending/descending order by clicking the column header.

2.6 Checking and Changing Shortcut Keys

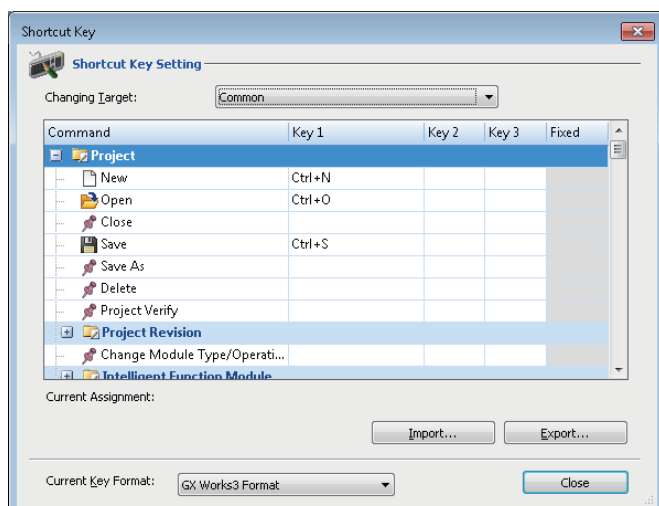
Shortcut keys of each function can be checked and changed in the "Shortcut Key" screen.

Up to three shortcut keys can be assigned to one command.

Settings on changed shortcut keys are saved in a personal computer for each user who logs on to Windows.

Window

Select [Tool] ⇒ [Shortcut Key].



Operating procedure

1. Double-click a command cell to change the shortcut key.
2. Press a key to assign on the keyboard.

■Changing the default setting

The shortcut key assignment set to the default can be changed by selecting a format from the pull-down list for "Current Key Format."

The available formats are as follows:

- GX Works3 format: Select this to reset the shortcut key assignment to the original one. Keys same as GX Works2 are included.
- GPPA format: Select this to change the shortcut key assignment for all commands to one same as GPPA in a batch.
- GPPW format: Select this to change the shortcut key assignment for all commands to one same as GX Developer in a batch.
- MEDOC format: Select this to change the shortcut key assignment for all commands to one same as MELSEC MEDOC in a batch.

Point

By importing an exported file (*.gks), the setting can be utilized on other personal computers.
Setting files exported in GX Works2 can also be imported.

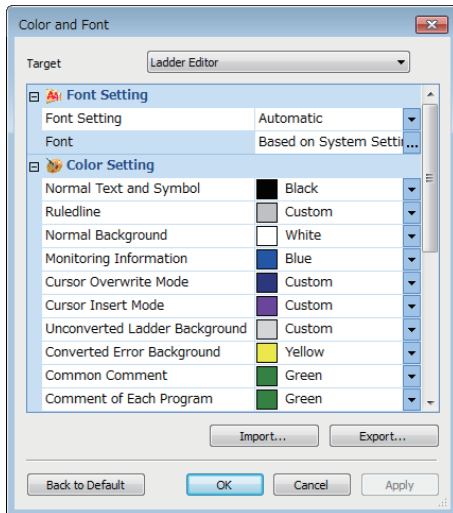
2.7 Checking and Changing Colors and Fonts

Colors and fonts used in each editor can be checked and changed in the "Color and Font" screen.

The changed color and font settings are saved in a personal computer for each user who logs on to Windows.

Window

Select [View] ⇒ [Color and Font].



Operating procedure

1. Select an editor from the pull-down list for "Target."
2. Select "User Setting" from the pull-down list for "Font Setting."
3. Set each item in the "Font" screen, and click the [OK] button.
4. Select a color to change in "Color Setting," and click the [Apply] button.
5. Click the [OK] button.

Point

By importing an exported file (*.gcs), the setting can be utilized on other personal computers. Setting files exported in GX Works2 can also be imported. However, color names may differ.

Precautions

Some fonts may be displayed as garbled characters.

If this happens, change the setting to another font.

2.8 Displaying and Reading Comments

Comments to be used in a project and ones to be displayed in each screen can be set in the "Multiple Comments Display Setting" screen.

Comments of elements such as common instructions or module FBs can be read in the "Read Comment" screen.

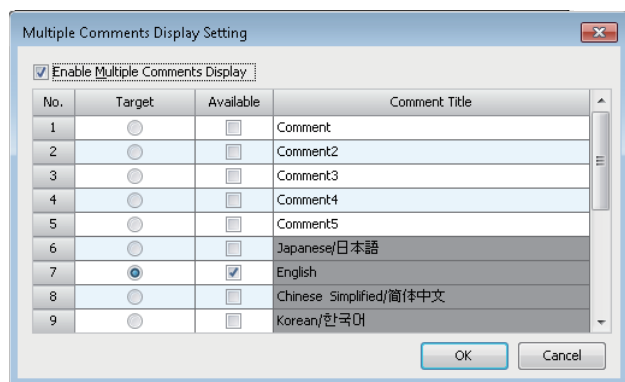
Display setting for multiple comments

In the "Multiple Comments Display Setting" screen, whether or not to use multiple comments for each element in a project can be set.

A comment to be used in a project and one to be displayed in each screen can be set as well.

Window

Select [View] ⇒ [Multiple Comments] ⇒ [Display Setting].



Operating procedure

1. Select the checkbox of "Enable Multiple Comments Display."
2. Select the checkbox of "Available," and enter a comment title.
3. Select a comment to display in a program editor or each monitor screen in the "Target" column, and click the [OK] button.

Point

- Up to five comment titles (comment No.1 to 5) can be set.
- Comment No.6 to 12 are used for entering comments in each language.

Precautions

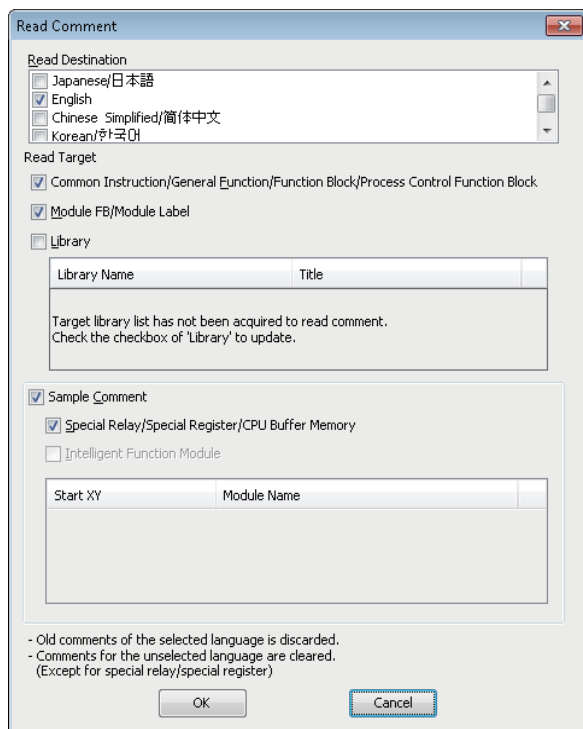
Do not use comment No.13 to 16 (Reserved 1 to 4).

Reading comments

Comments of elements such as a common instruction and module FB can be read.

Window

Select [View] ⇒ [Multiple Comments] ⇒ [Read Comment].



Operating procedure

1. Select the checkbox of a language to display in "Read Destination."
 2. Select the checkboxes of elements to read their comments in "Read Target," then click the [OK] button.
- The comment for each element is applied to the device comment editor of "Common Device Comment."

Point

For the elements which have been used in a project, comments in another language can be added.
To switch the display language of the comments, use the "Multiple Comments Display Setting" screen.
☞ Page 83 Display setting for multiple comments

Precautions

- For the considerations for reading sample comments, refer to the following:
☞ Page 420 Reading sample comments
- When reading label comments of process control function blocks, module FBs, module labels, and libraries, only Japanese and English comments can be read.
Even if the checkboxes of other languages are selected, the comments in those languages are not read.

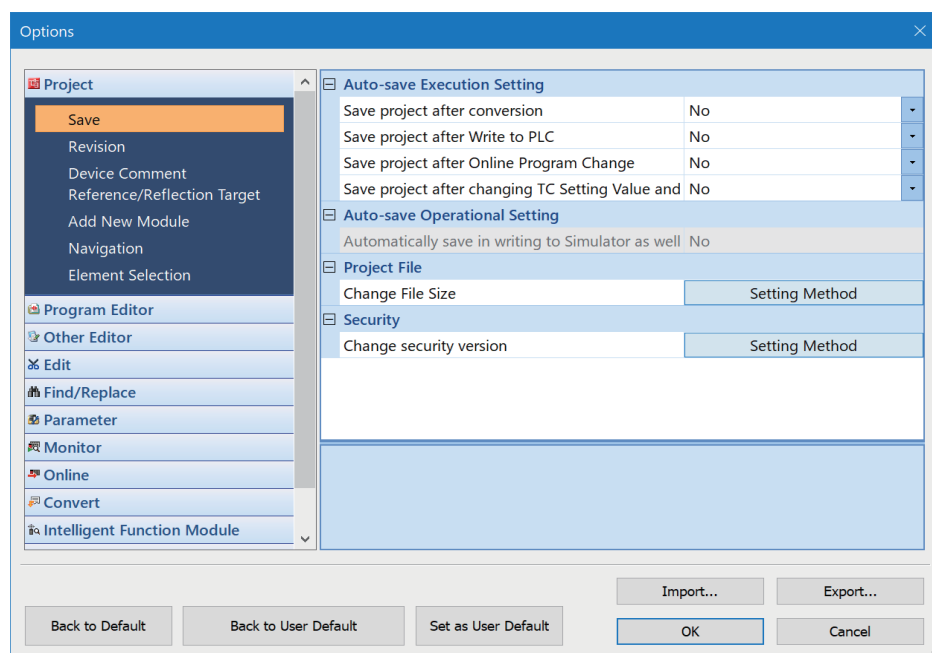
2.9 Option Settings for Each Function

Some functions and editors include the option settings. By changing the option settings, the screen display format can be changed and the detailed operation settings for each function can be set.

The changed option settings are saved in a project. However, they are saved in a personal computer for each user who logs on to Windows if set as default values.

Window

Select [Tool] ⇒ [Options].



Operating procedure

Set each item and click the [OK] button.

Point

By importing an exported file (*.gos), the settings can be utilized on other personal computers.

However, note that settings of the following option items are not exported:

- "Project" ⇒ "Device Comment Reference/Reflection Target"
- "Monitor" ⇒ "Common Item" ⇒ "Timing to Execute Monitor Function and Modify Value Function" ⇒ "After the execution of specified program"

Precautions

■Converting programs

After changing the following option setting, converting all programs is required.

- [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Data Type Setting"
- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting"

As a precautionary measure, perform the following operation before switching the CPU module to RUN.

1. Reset the CPU module.
2. Clear values of devices/labels to '0' (Including latch).
3. Clear values of file registers to '0.'

Optimization of the number of steps

By setting the following options, the number of program steps can be reduced.

■RCPU

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize the Number of Steps"
- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize Level"

■FX5CPU

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize the Number of Steps"
- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Collectively Allocate Temporary Area to Optimize the Number of Steps"
- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize Level"

Precautions

- Depending on each option setting and the version of GX Works3, the number of steps of a program, module FB, and library (with the "mslm" extension) may differ from the value mentioned in each manual.

■Optimize level

The following shows the difference in processing between the optimize levels.

- Level 1: By optimizing the redundant processing in a program at conversion, the number of steps in the program is reduced.
- Level 2: In addition to the processing in the level 1, the number of steps may be further reduced if any of the following conditions is satisfied in each program.

| Condition | Program |
|---|---|
| A standard function is being used. | Ladder program ST program SFC program FBD/LD program |
| An input/output label (VAR_IN_OUT) is being used in a macro type function block. | ST program FBD/LD program |
| Binary operation is being used. | ST program |
| Unary operation is being used. | |
| ELSE is being used in a select statement (IF statement or CASE statement). | |
| A contact element is connected to a left power rail element. | FBD/LD program |
| Any of the following instructions or functions is being used. <ul style="list-style-type: none">• Rising instruction (PLS)• Falling instruction (PLF)• Boolean function• Comparison function | |
| Ladders containing a variable element which substitutes its value into the next variable element are consecutively placed. | |
| ENO of a function is connected to EN of another function. | |
| ENO of a function is not connected to another element. | |

■Project for which "Yes" is selected for "Optimize the Number of Steps"



A conversion error may occur in a project that satisfies the following two conditions. In that case, a subroutine program or interrupt program must be changed to a program using an FB or inline structured text box.

- "Yes" is selected for "Optimize the Number of Steps" in [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps"*1.

- Any of the data in the following table is used in a subroutine program or an interrupt program.

*1 For a project for an FX5CPU, "Yes" needs to be selected in the following option as well.

[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Collectively Allocate Temporary Area to Optimize the Number of Steps"

| No. | Data |
|-----|---|
| 1 | <p>A label for which two or more devices or labels are used as the index of an array set for the data type (Example) Data type: structure array</p>  <p>(Example) Data type: two-dimensional array</p>  |
| 2 | A subroutine type function block in which EN/ENO is used |
| 3 | <p>Standard function</p> <p>DINT_TO_BCD(_E), BCD_TO_DINT(_E), MUL(_E), DIV(_E), MOD(_E), XOR(_E), SEL(_E), MAX(_E), MIN(_E), MUX(_E), GT(_E), GE(_E), EQ(_E), LE(_E), LT(_E), MID(_E), CONCAT(_E), INSERT(_E), MUL_TIME(_E), DIV_TIME(_E)</p> |

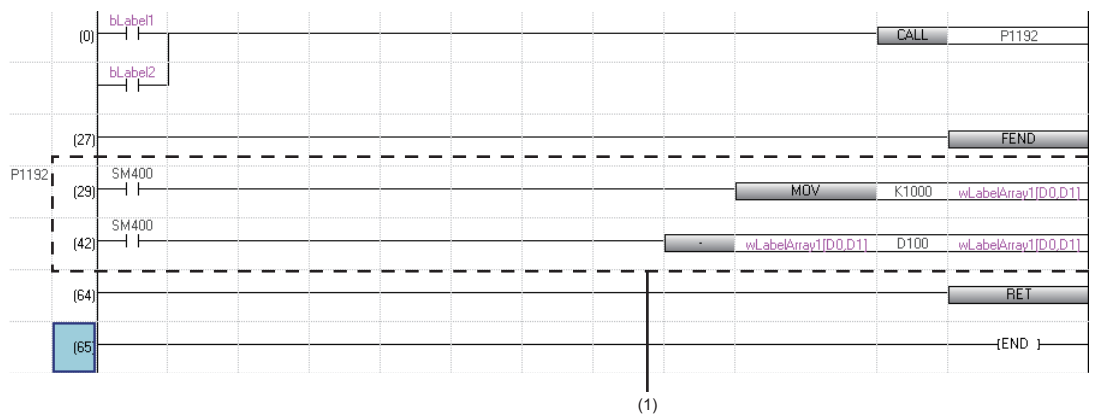
Modify a subroutine program or an interrupt program by any of the following methods.

(1) Change a program to a function block.

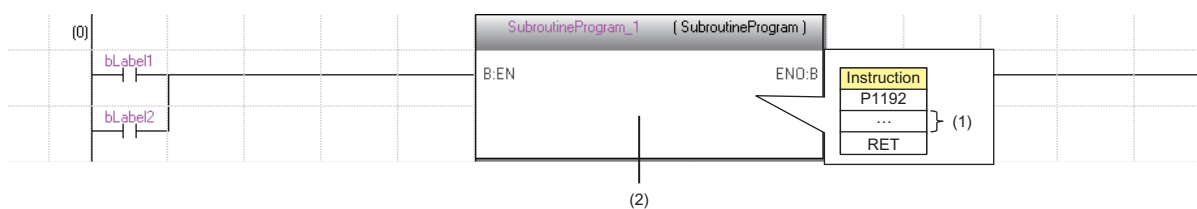
Subroutine program

- Change the subroutine program (1) to the function block (2), and change the program to call the created function block (2).

(Example) Program before modification



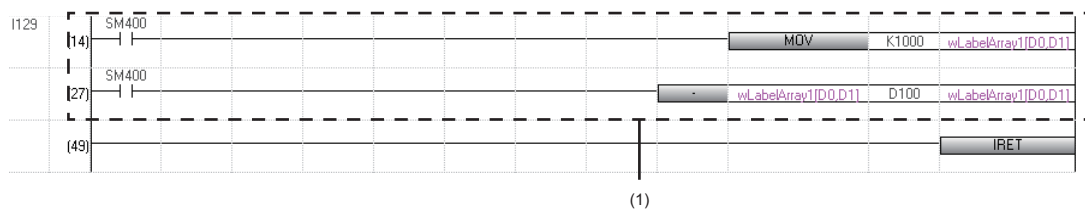
(Example) Program after modification



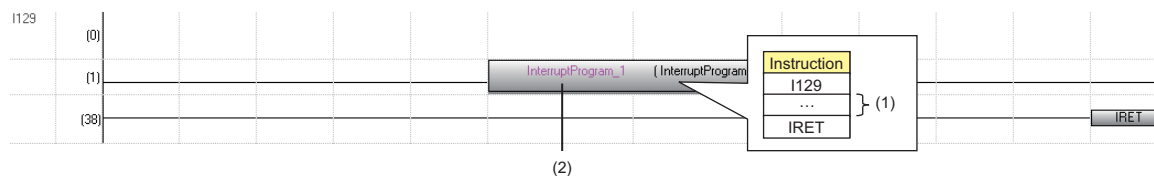
Interrupt program

- Change the interrupt program (1) to the function block (2).

(Example) Program before modification



(Example) Program after modification

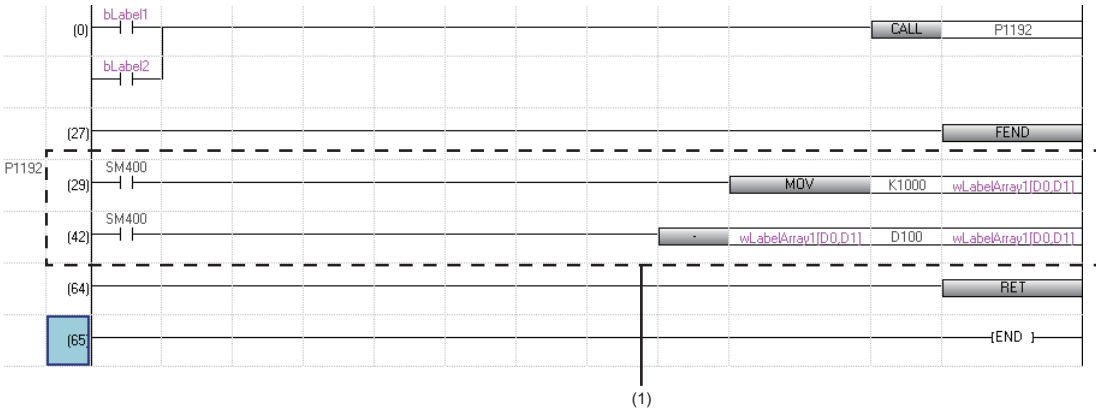


(2) Change a program to an inline structured text box.

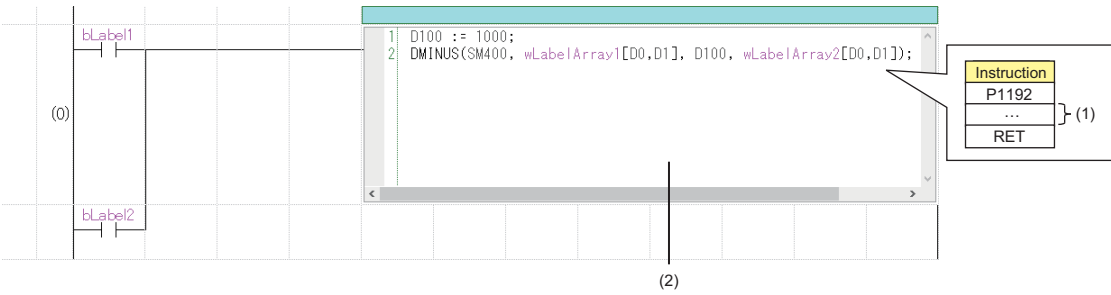
Subroutine program

- Create the subroutine program (1) to the inline structured text box (2), and change the program to call the created inline structured text box (2).

(Example) Program before modification



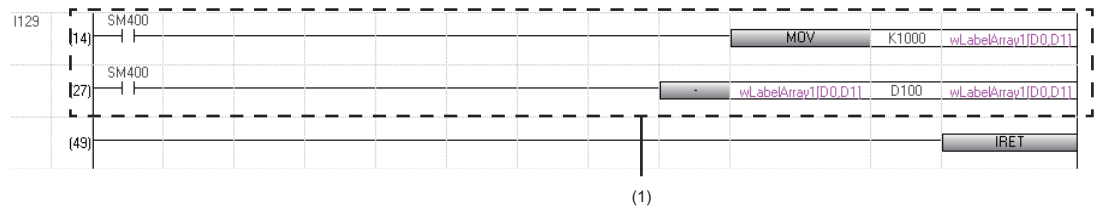
(Example) Program after modification



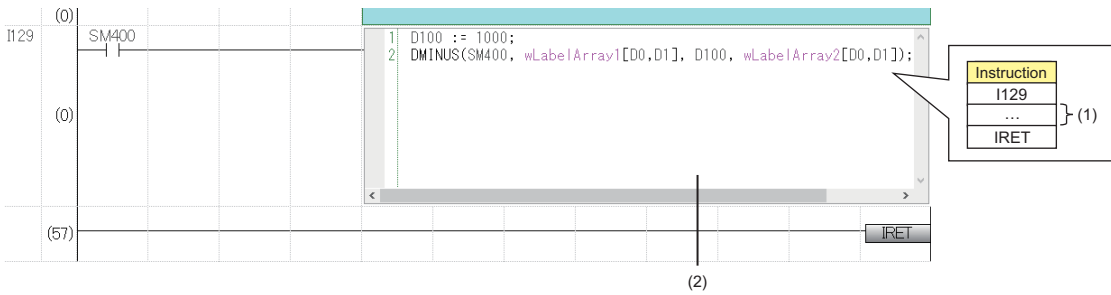
Interrupt program

- Change the interrupt program (1) to the inline structured text box (2).

(Example) Program before modification



(Example) Program after modification



■An error 'Temporary area exceeded' occurs in an FX5CPU

A temporary area is used for passing and receiving the arguments of function blocks and functions, and calculating operations.

The memory capacity for a temporary area that can be allocated for each program block in a program file is limited. If a program file including a program block exceeding the capacity is written to a CPU module, an error 'Temporary area exceeded' will occur.

In that case, reduce the usage of the temporary area for one program block by any of the following actions.

- Set "No" for "Collectively Allocate Temporary Area to Optimize the Number of Steps" in [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps."
- Divide one program block into some program blocks.

The capacity of a temporary area can be extended from 700 words to 32767 words by setting the following CPU parameter to "128000 Steps":

- "Program Setting" ⇒ "Program Capacity Setting"

For details, refer to the following:

 MELSEC iQ-F FX5 User's Manual (Application)

Process control extension setting

CAUTION

■ To set the event notification, confirm the setting contents carefully.

If there is no module set in "Event Notification" or the setting contents is incorrect, the following phenomena may result when an event occurs.

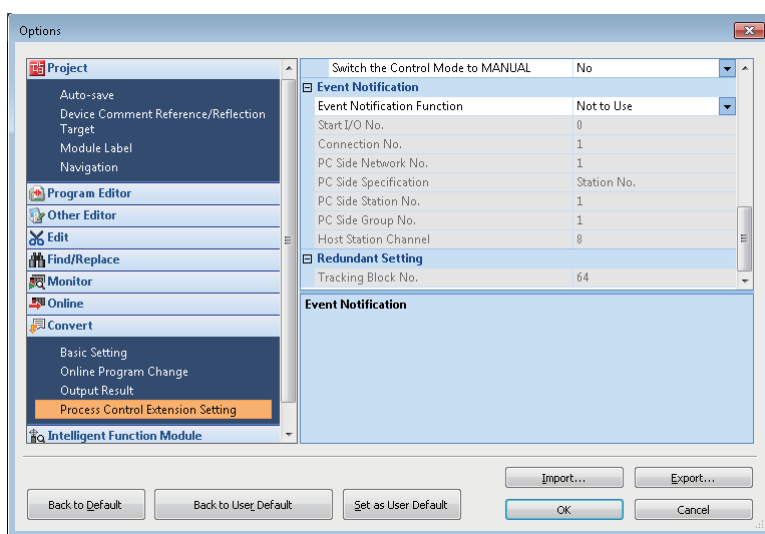
- The CPU module stopped due to the error.
- The network module communication error occurs.
- No event notification is received.

When adjusting the system, after confirming that nothing affects of the actual system, it is recommended to check that the above phenomena do not result when an event occurs by an operation such as switching the control modes of a faceplate (example: MANUAL → AUTO, AUTO → MANUAL).

2

Window

Select [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting."



■ Event notification

The following table shows the options of "Event Notification Function."

| Options | Description |
|-------------------------------|---|
| Not to Use | No event is notified to PX Developer Monitor Tool even though an event occurs (including an alarm) in a CPU module. |
| Built-in Ethernet Port CPU | Events (including an alarm) occurred in a CPU module are notified to PX Developer Monitor Tool via an Ethernet port. |
| Ethernet | Events (including an alarm) occurred in a CPU module are notified to PX Developer Monitor Tool via Ethernet. |
| Q Compatible Ethernet | Specify the connection number of port 1 for "Connection No." When using an Ethernet module (Port 1 network type: Q-compatible Ethernet), select "Q Compatible Ethernet." For details on Q-compatible Ethernet, refer to the following: MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup) |
| CC-Link IE Controller Network | Events (including an alarm) occurred in a CPU module are notified to PX Developer Monitor Tool via CC-Link IE Controller Network. |

Precautions

■For CC-Link IE Controller Network

Do not use the following channel numbers for the link dedicated instructions in a ladder program.

- Channel number used by the own station: Channel number set in "Event Notification"
- Channel number of a target station used for storing data: 1 (number for PX Developer Monitor Tool)

For details on channel numbers, refer to the manual of a network module used.

■For an Ethernet module/built-in Ethernet CPU

Broadcast in UDP/IP is used for sending data.

The UDP connection device number (broadcast) that was added in the following parameter is required to be set for "Connection No." in "Event Notification."

- Ethernet module: "Module Information" ⇒ "(module name)" ⇒ "(module parameter)" ⇒ "Basic Settings" ⇒ "External Device Configuration"
- Built-in Ethernet CPU: "(CPU model name of the project)" ⇒ "Module Parameter" ⇒ "Basic Settings" ⇒ "External Device Configuration"

The same number needs to be set for "Port No." of "Sensor/Device" and "Event Notification UDP Port No.(HEX)" in PX Developer Monitor Tool.


For details, refer to the following:

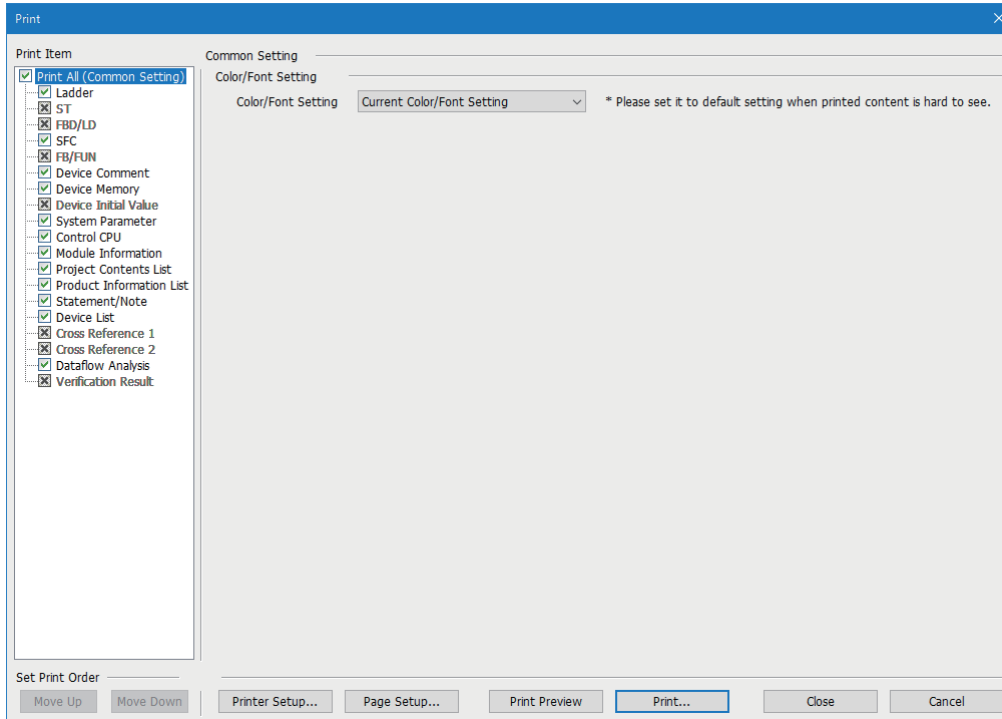
 PX Developer Version 1 Operating Manual (Monitor Tool)

2.10 Printing Data

This section explains the printing method of data created in GX Works3.

Window

Select [Project] ⇒ [Print] ()



When no data to be printed exists, × is shown on the checkbox of print items.

Operating procedure

1. Select data to print and set each setting.
2. Change the printer by clicking the [Printer Setup] button and set the page setting by clicking the [Page Setup] button.
3. Click the [Print] button.

Point

If the print result is hard to see, it will be more visible by changing its colors and fonts to the defaults when printing. (Example: When the background color of an editor is set to black, the background color in print result can be changed to white.)

By setting the following option, the color and font for the printing can be changed.

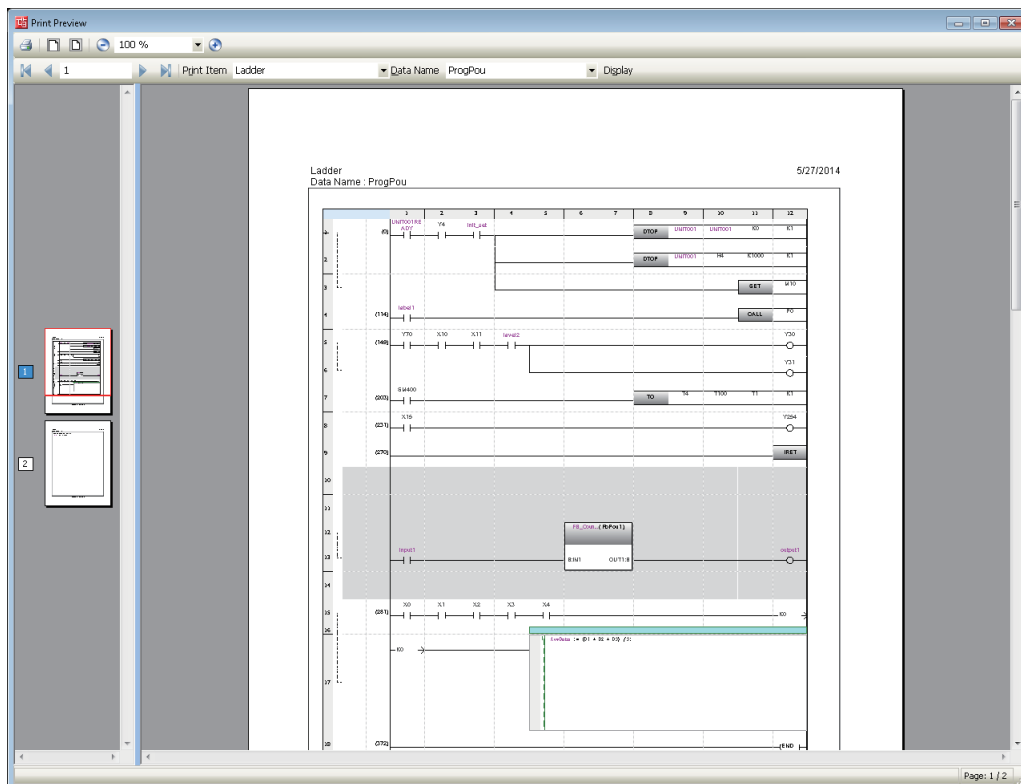
- "Print All (Common Setting)" ⇒ "Common Setting" ⇒ "Color/Font Setting" in the "Print" screen

Print image preview

The print image of each data can be checked.

Window

Select [Project] ⇒ [Print Preview].



Operating procedure

1. Select [Project] ⇒ [Print Preview].
2. Click the [Print Preview] button in the "Print" screen.
3. To change data to preview, select "Print Item" and "Data Name," and click the [Display] button.

Considerations

■Displaying print previews and printing data

While the following functions are being performed, neither displaying print preview nor printing data can be performed.

- Monitor
- Simulation
- Offline monitor

■Printing a large amount of data

Large amount of data may not be printed at all or printed half way due to the limitations of printer driver or Windows print spooler. In this case, print the data by any of the following methods.

- Split the data by setting a print range.
- Select "Print directly to the printer" in the [Advanced] tab of the property screen (select [View devices and printers] in the control panel of Windows).
- Set "Output by Item" for the print job output in the "Printer Setup" screen.

■Outputting the print contents on a file

- When print contents are output to a file, the "Save As" screen may appear in the background of other screens.
Press the **[Alt]** + **[Tab]** keys or **[Alt]** + **[F4]** keys to bring the screen in the foreground.
- GX Works3 will not respond if it is operated while the "Save As" screen is being displayed.
When the message appears, select "Wait for the program to respond." Selecting "Close the program" results in loss of unsaved data.

■Printing ladder programs

For "Start Row" and "--End Row" of "Specify Print Range," specify the rows that is shown when a whole program is displayed in a ladder editor.

Depending on the following setting and menu selection, the number of rows in print result may differ from that of the range specified.

- Print screen setting: "Ladder" ⇒ "Setting by Item (Ladder)" ⇒ "Additional Information" ⇒ "Statement/Note" in the "Print" screen
- View menu: [View] ⇒ [Statement Display] and [Note Display]

○: Selected, —: Unselected

| Print screen setting | View menu | | Print result |
|----------------------|-----------|------|--------------|
| Statement/Note | Statement | Note | |
| ○ | ○ | ○ | Matched |
| | ○ | — | Mismatched |
| | — | ○ | |
| | — | — | |
| — | ○ | ○ | |
| | ○ | — | |
| | — | ○ | |
| | — | — | Matched |

The display magnification of a print result is 100%.

If the display magnification^{*1} of a ladder editor is set to a value other than 100%, some texts may get cut in a print result. In this case, set the display magnification^{*1} of a ladder editor to 100%, and adjust the column width as necessary.

^{*1} Can be set in the following menu:
[View] ⇒ [Zoom] ⇒ [Set Zoom Factor]

Point

When the character size is adjusted according to the display magnification of the editor by using the following menu, the characters are printed in that size.

- [View] ⇒ [Text Size] ⇒ [Autofit]

■Printing FBD/LD programs

In an FBD/LD editor, elements can be placed anywhere. Therefore, the elements may be printed across multiple pages as shown below.

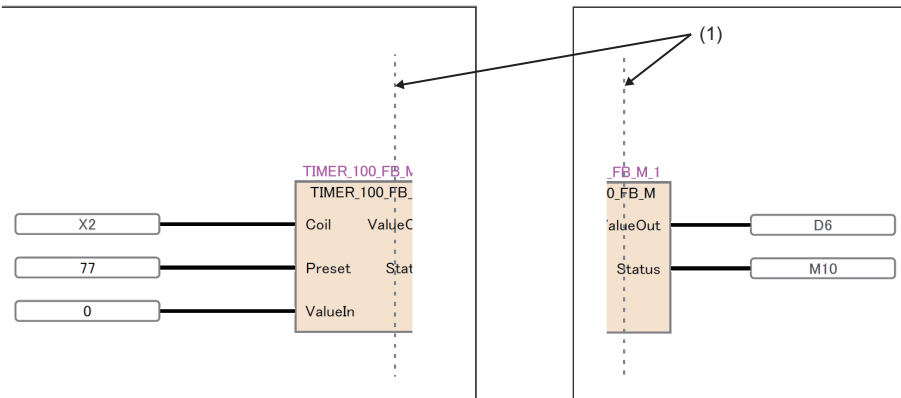
Check where the page breaks are by any of the following methods before printing.

- Select [View] ⇒ [Display Page Break].
- Click the [Print Preview] button in the "Print" screen.

The paper setting different from one in the page setting can be set in "FBD/LD" in the "Print" screen.

Ex.

When the elements are printed across multiple pages, dashed lines (1) are displayed on the verges of the pages.



When setting "Zoom" in "Setting by Item (FBD/LD)" of the "Print" screen, note the following:

- If an FBD/LD program is too big, the program may be printed across multiple pages even when the checkbox of "Fit to One Page" is selected.
- The page break in an FBD/LD editor is always displayed on the basis of a magnification of 100% regardless of the selection status of "Fit to One Page" and the value in "Zoom."

Therefore, the page break for printing may differ from the one displayed in the editor.

■Printing inline structured text programs used in FBD/LD programs

An inline structured text program used in an FBD/LD program can be printed by selecting the checkbox of the following item:

- "Print" screen ⇒ "Setting by Item (FBD/LD)" ⇒ "Additional Information" ⇒ "Inline Structured Text"

Line numbers can be printed by selecting the checkbox of the following item:

- "Print" screen ⇒ "Setting by Item (ST)" ⇒ "Print Conditions" ⇒ "Print Row No."

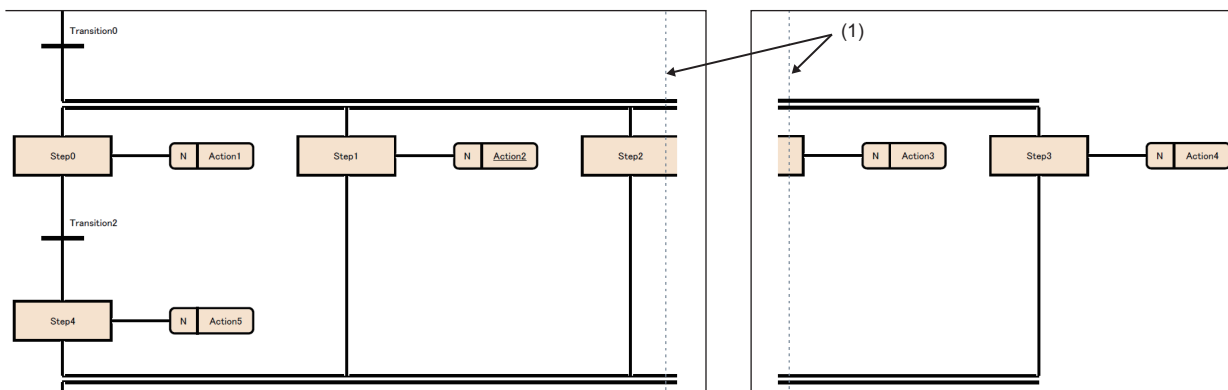
However, the print range cannot be changed. The whole range of an inline structured text program is printed.

■Printing SFC programs

- When printing statements and notes, ones in a Zoom are not printed.
- In an SFC diagram editor, SFC elements may be printed across multiple pages as shown below. Check the layout in the print preview before printing.

Ex.

When the elements are printed across multiple pages, dashed lines (1) are displayed on the verges of the pages.



When setting "SFC Diagram Detailed Settings" in "Setting by Item (SFC)" of the "Print" screen, note the following:

- "SFC Diagram Detailed Settings" can be set only when the checkbox of "SFC Diagram" in "Program Block Print Item" is selected.
- If an SFC program is too big, the program may be printed across multiple pages even when the checkbox of "Fit to One Page" is selected.
- Actions on an SFC diagram are not printed if the checkboxes of the following two items are selected; however, Zooms (actions/transitions) are printed.
 - "Program Block Print Item" — "Action/Transition"
 - "SFC Diagram Detailed Settings" — "Do not Print Actions"

■Printing a product information list

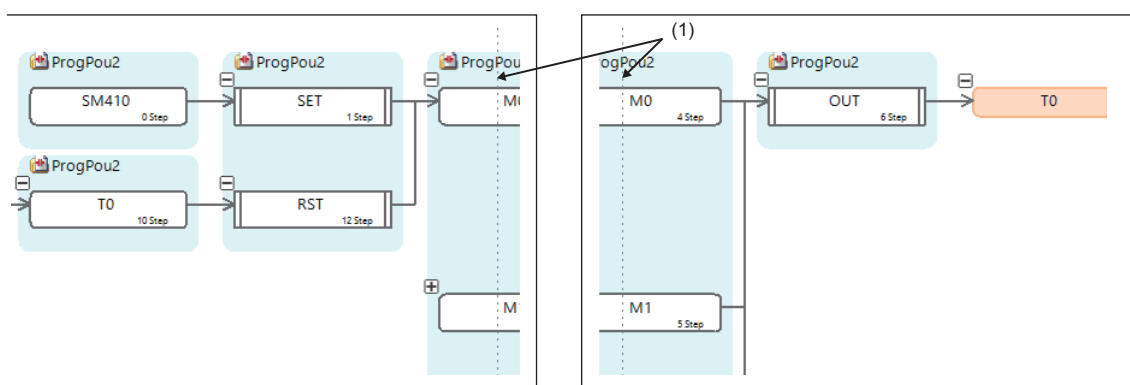
The information in a specified CSV file is printed out within the range of 500 rows × 20 columns.

■Printing a data flow diagram

- In a data flow diagram, blocks may be printed across multiple pages as shown below. Check the layout in the print preview before printing.

Ex.

When the blocks are printed across multiple pages, dashed lines (1) are displayed on the verges of the pages.



- If a data flow diagram is too big, the diagram may be printed across multiple pages even when the checkbox of "Fit to One Page" is selected.

PART 2

SYSTEM DESIGN AND SETTINGS

This part explains the system design such as project management and parameter/label settings.

3 PROJECT MANAGEMENT

4 CREATING MODULE CONFIGURATION DIAGRAM AND SETTING PARAMETERS

5 REGISTERING LABELS

3 PROJECT MANAGEMENT

This chapter explains basic operations and management of a project.

3.1 Project File and Data Configuration

Projects created in GX Works3 are saved as a workspace format or single file format.

Data created in a project is displayed in the navigation window.

File format

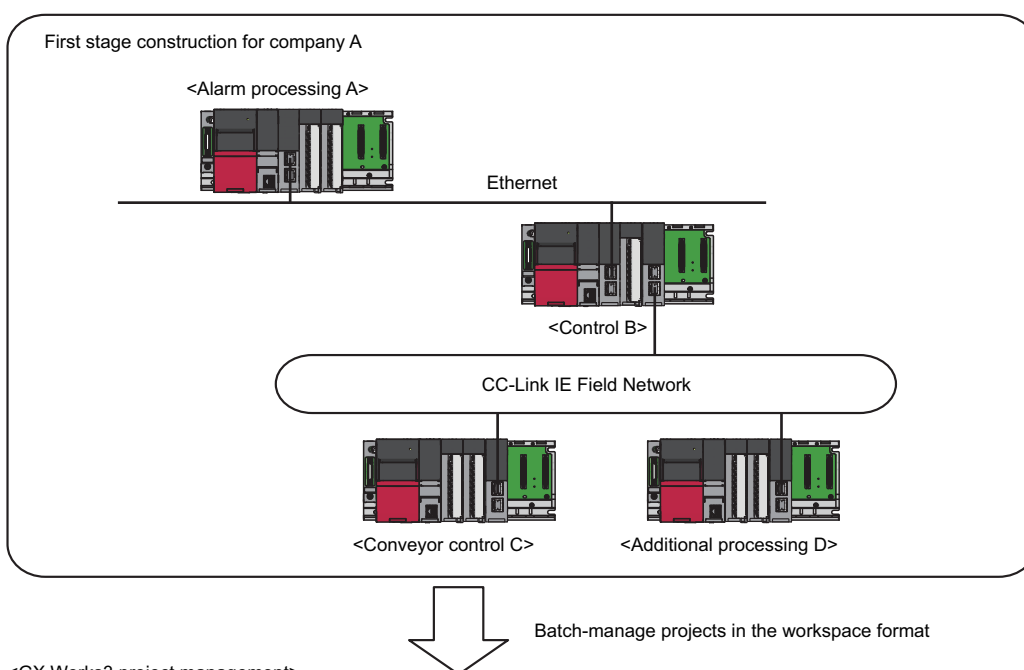
Workspace format

A workspace manages multiple projects at once.

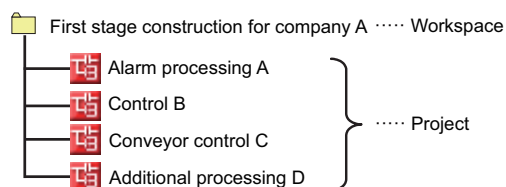
When constructing a system composed with multiple CPU modules, a project file needs to be created for each CPU module.

Multiple project files in a same system can be managed by saving them as a workspace format.

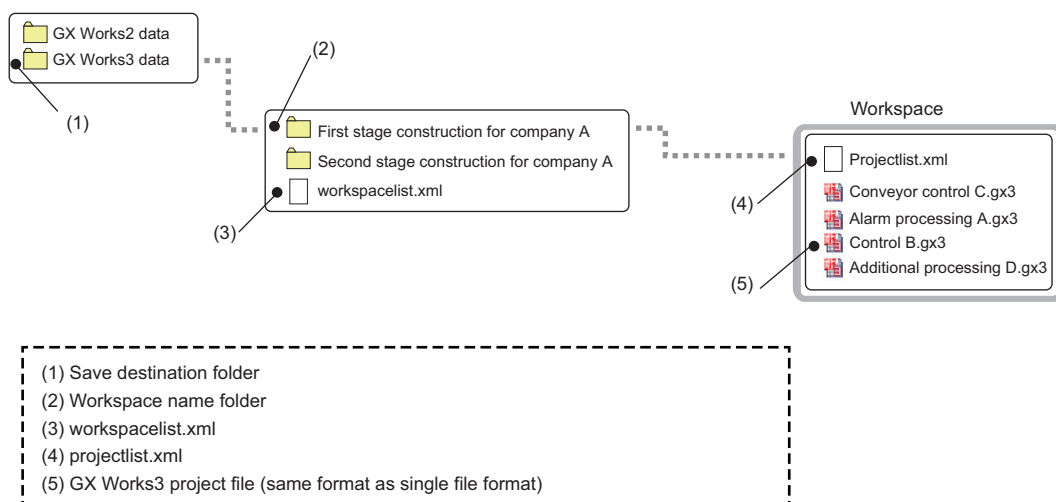
<System configuration example>



<GX Works3 project management>



■Workspace/project configuration



● Editing a configuration or name

Do not change or delete a workspace configuration or project name by using an application such as Windows Explorer. A project that does not contain actual data may remain in the project list displayed in the "Open Project" screen. (Select [Project] ⇒ [Delete] to delete the project.)

● Copying a project

To copy a project by using an application such as Windows Explorer, perform any of the operations listed below. By doing so, a project can be copied without collapsing the configuration of the workspace/project.

- Copy an entire save destination folder ((1) in the above figure).
- Copy a workspace name folder and "workspacelist.xml" ((2) and (3) in the above figure).
- Copy a GX Works3 project with the same name.

Single file format

A single file format does not need a workspace.

Projects can be managed regardless of the folder configuration and the file configuration by saving projects as a single file format.

Thereby, operations such as changing a project name, copying and pasting a project, and sending and receiving data can easily be performed using an application such as Windows Explorer.

Safety project backup

A system administrator needs to back up a safety project and save the data securely to restore it anytime.

To back up a project, be sure to use the menu [Project] ⇒ [Save As] in GX Works3.


Data configuration

Data displayed in the navigation window

The following shows the data displayed in the navigation window in a tree. (Default data names are used.)

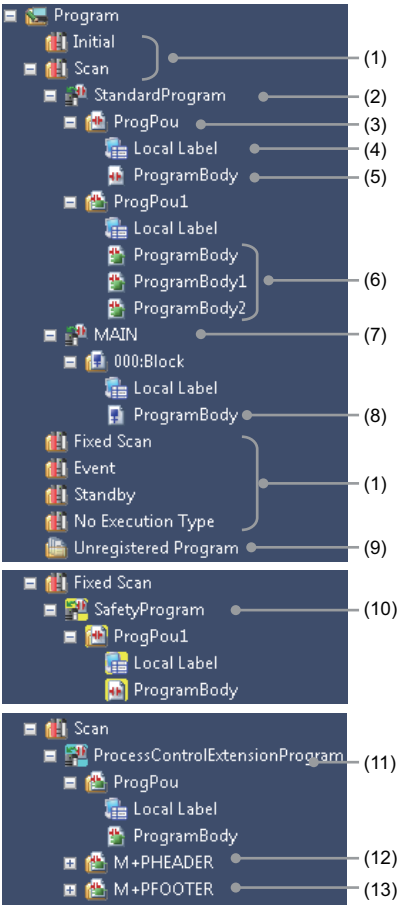




■Module configuration data

Creation method:  Page 196 Creating a Module Configuration Diagram

| Image | Item | Description |
|--|------------------------------|--|
|  Module Configuration | Module configuration diagram | Data that displays a target system of a project graphically. |

■Program data

Creation method:  Page 131 Creating Data

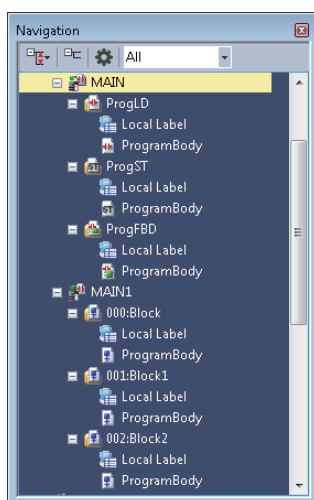
| Image | Item | Description |
|--|---|--|
|  | (1) Execution type | A setting for a situation when a program runs. To execute a program in a CPU module, the program need to be assigned to any of the execution types.  Page 273 Setting method |
| | (2) Program file | A file that manages programs. It should be created for each execution process. Created files are written to a CPU module individually. |
| | (3) Program block (POU) | Data that composes programs. The execution order can be set ( Page 272 Program execution order setting). |
| | (4) Local label | Label data that can be used only in a defined program block |
| | (5) Program body | Program data that is created in Ladder Diagram language |
| | (6) Worksheet (Program body) | Program data that is created in Structured Text or Function Block Diagram/Ladder Diagram language. By using Structured Text or Function Block Diagram/Ladder Diagram language, multiple worksheets (program bodies) can be created in a program block. The execution order can be set ( Page 273 Worksheet execution order setting). |
| | (7) Block | Data that composes SFC blocks |
| | (8) Program body | SFC diagram data that is created by using Sequential Function Chart language |
| | (9) Unregistered program | A folder that temporarily stores program files with no execution type determined. Stored program files will not be executed if they are written to a programmable controller. |
| | (10) Program file (For safety) | A file that manages safety programs |
| | (11) Program file (For process control) | A program file with the process control extension enabled |
| | (12) System header | A program block required to execute a process control program of the scan execution type. No editing is allowed.  Page 437 System header and system footer |
| | (13) System footer | |

| Image | Item | Description |
|-------|-------------------------------|--|
| | (14) FB file | A file that manages function blocks. FB files are written to a CPU module individually. ☞ Page 505 Creating a Function Block |
| | (15) Function block (POU) | Data that composes the programs of function blocks |
| | (16) Local label | Label data that can be used only in defined function blocks |
| | (17) Program body | Function block data that is created in Ladder Diagram language. This data is referred to as an 'FB program' in this manual. |
| | (18) Worksheet (Program body) | Function block data that is created in Structured Text or Function Block Diagram/Ladder Diagram language. Multiple worksheets can be created in a function block. In addition, the execution order can be set (☞ Page 273 Worksheet execution order setting). This data is referred to as an 'FB program' in this manual. |
| | (19) FB file (For safety) | A file that manages a function block of a safety program |
| | (20) FUN file | A file that manages functions. The function files are written to a CPU module for each FUN file. ☞ Page 525 Creating a Function |
| | (21) Function (POU) | Data that composes a program of a function |
| | (22) Local label | Label data that can be used only in defined functions |
| | (23) Program body | Function data that is created in Ladder Diagram language. This data is referred to as a 'FUN program' in this manual. |
| | (24) Worksheet (Program body) | Function data that is created in Structured Text or Function Block Diagram/Ladder Diagram language. Multiple worksheets can be created in a function. In addition, the execution order can be set (☞ Page 273 Worksheet execution order setting). This data is referred to as a 'FUN program' in this manual. |
| | (25) FUN file (For safety) | A file that manages functions of safety programs |

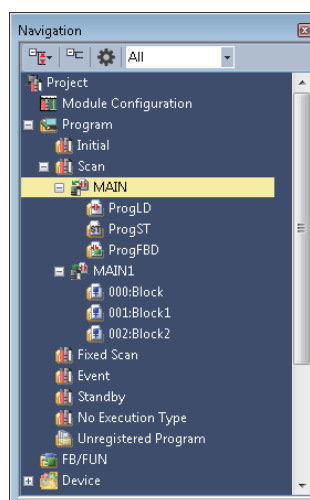
Point

When a label or a program body is set to be hidden, a program block, function block, and function is displayed at the lowermost layer (i.e. the layer of them in the tree is not displayed). Therefore, some data items, which are usually displayed on the lower part of the tree, can be seen without scrolling.

- Select "No" for "Display Labels" and "Display the Program Body" from [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Navigation" ⇒ "Display Setting."







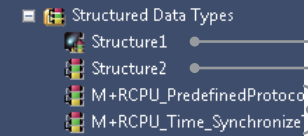
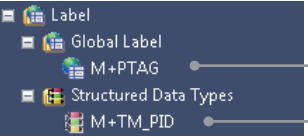

Display Labels: Yes
Display the Program Body: Yes



Display Labels: No
Display the Program Body: No






■Label data

Creation method:  Page 131 Creating Data

| Image | Item | Description |
|---|---|--|
|  | (1) Global label | A label that can be accessed from all program blocks and function blocks in a project  Page 235 Registering Labels |
| | (2) Module label | A label that is used to access an I/O signal or buffer memory of a module  Page 258 Registering Module Labels |
| | (3) Safety global label | A global label for safety programs |
| | (4) Standard/safety shared label | A global label that can be used in both standard programs and safety programs |
|  | (5) System structure definition | A structure registered in the system label database |
| | (6) Structure definition | Data that defines structure as a data type. This can be used as a data type of all labels which can be defined in a project except for a recursive definition in the defined structure. |
| | (7) Structure definition required for module labels | Data that automatically registers a structure required for a module label |
|  | (8) Global label used for the process control extension | A global label that is automatically created as "M+PTAG" at the time of registration of tag FBs. A tag FB instance and tag data are registered.  Page 260 Registering Tag FBs |
| | (9) Structure definition of tag data | Structure definition of tag data that is automatically registered at the time of registration of tag FBs |

■Device data

Creation method:  Page 131 Creating Data

| Image | Item | Description |
|---|---------------------------------|--|
|  | (1) Each program device comment | Data of device comments that can be used in a program file with the same name as this data  Page 411 Registering Device Comments |
| | (2) Common device comment | Data of device comments that can be used in multiple programs  Page 411 Registering Device Comments |
| | (3) Device memory | Data that includes a value to be written to/read from a device in a CPU module  Page 448 SETTING DEVICE MEMORY |
| | (4) Initial device value | Data that defines a value which is set to a device when a CPU module is in RUN  Page 456 INITIAL DEVICE VALUE SETTING |

■Parameter data

The structure of the tree and the creation methods:  Page 207 Setting Parameters

3.2 Creating a Project File


This section explains the methods for some operations such creating, opening, and or saving a project.

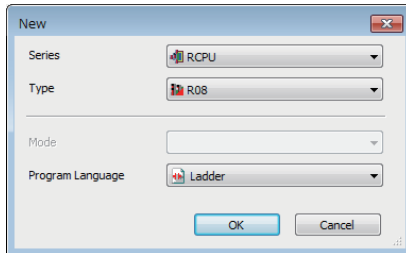
Creating a project

The following explains the creation methods of a new project.

For a safety project, a user registration is required. ( Page 106 Adding a new user)

Window

Select [Project] ⇒ [New] ().



Operating procedure

Select each item and click the [OK] button.

Precautions

When creating a safety project, set a screen saver in Windows to lock the personal computer automatically if the non-operated state has been continued for a certain time.

For details, refer to Windows Help and Support.

■Selecting a QCPU (Q mode), an LCPU, or an FXCPU

When a QCPU (Q mode), an LCPU, or an FXCPU is selected, GX Works3 starts in the Q/L/FX series compatibility mode.

It will automatically start up only when GX Works2 Version 1.566Q or later is installed in the personal computer.

If it is not installed, execute "setup.exe" in the installation DVD (Disk2) of GX Works3.

■Creating a project for an RnENCPU

An RnENCPU consists of the two slots; CPU part and network part.

The CPU part only is placed after creating a new project.

Place the network part any of the following methods.

- Place a CPU extension module (_RJ71EN71) in the "Module Configuration" window.
- Set a CPU extension module (_RJ71EN71) in "I/O Assignment Setting" in "System Parameter."

■Creating a project for an LHCPU

When a new project for an LHCPU is created, a CPU extension module (_IO) is automatically set for "I/O Assignment Setting" in "System Parameter."

■Specifying the specific model name of FX5CPU

The specific model name of an FX5CPU cannot be specified in the "New" screen. Specify it by either of the following methods:

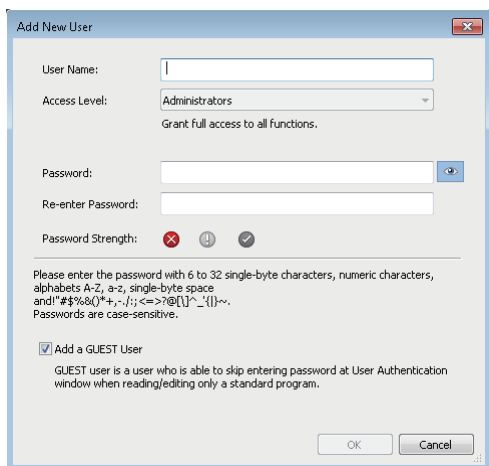
- Right-click a CPU module on the module configuration diagram, then click [Change CPU Model Name] from the shortcut menu.
- Select the model name of a CPU module in "I/O Assignment Setting" on the [I/O Assignment] tab of the "System Parameter" screen.

Adding a new user

When creating a new safety project, a user registration is required in the "Add New User" screen.

Window

1. Select an RnPSFCPU or an RnSFCPU for "Type" in the "New" screen.
2. Click the [OK] button.



Operating procedure

1. Set each item and click the [OK] button.
To register a guest user, select the checkbox of "Add a GUEST User." (📖 Page 708 Guest user)
2. Set each item in the "Save as" screen and click the [Save] button.

Creating a new project by reading data read from a programmable controller

When data is read from a programmable controller without creating a new project, a new project is created based on the data from a CPU module and intelligent function module.

When a QCPU (Q mode), an LCPU, or an FXCPU is selected, GX Works3 is started in the Q/L/FX series compatibility mode and a new project can be created.

When user information is registered to a project, user authentication is required. (📖 Page 715 Logging on to a CPU module)

Operating procedure

1. Start GX Works3 and select [Online] ⇒ [Read from PLC] (🖱️).
2. Select the series to be read in the "Series Selection" screen, and click the [OK] button.
3. Set the communication route to access the CPU module in the "Specify Connection Destination" screen, and click the [OK] button.
4. Read data in the "Online Data Operation" screen.

For reading data in the "Online Data Operation" screen, refer to the following:

📖 Page 609 Reading data from a programmable controller

Precautions


When parameters are not read from the programmable controller with data to create a new project, default parameters will be set. Check the parameter setting.

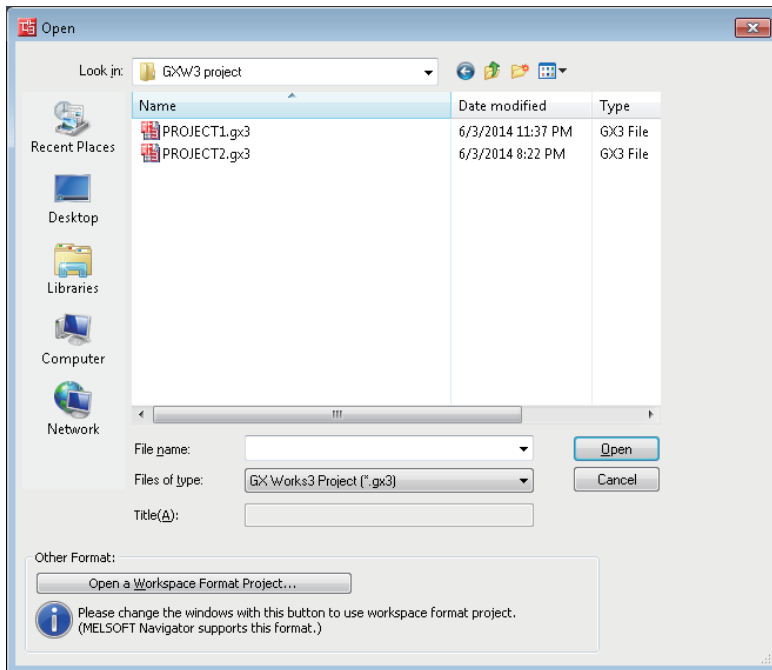
Opening a project

Read a project saved on a personal computer or another data storage device.

When user information is registered to a project, user authentication is required. ( Page 715 Logging on to a CPU module)

Window

Select [Project] ⇒ [Open] ().



Operating procedure

Set each item and click the [Open] button.

Precautions

■ Changing workspace names and folder configuration

Do not change a storage location and a file name for folders and files of a workspace/project by using an application such as Windows Explorer.

■ Opening a project being edited by another user

The project can be opened as a read-only project. However, the following functions cannot be used.

- Overwriting projects
- Changing the module type and operation mode

■ Projects saved on a network drive or removable media

Do not open the project directly. Open it after saving it to a personal computer.

■ Opening a safety project

Set the screen saver in Windows to lock a personal computer when no operation has been performed for a certain time. For details, refer to Windows Help and Support.

■Opening a project for a QCPU (Q mode), an LCPU, or an FXCPU

When one of the following project is selected, the project is opened with the Q/L/FX series compatibility mode in GX Works3.

- GX Works2 project saved as a single file format
- GX Works2 project saved in a workspace format
- GX Works3 project created in the Q/L/FX series compatibility mode which was saved as a single file format

When opening a project which was compressed in GX Works2, decompress the project in GX Works2 in advance.

■Opening a project including a module FB

When opening a project including a module FB, the following message may appear.

- Message: Module FB version using in project is different from the one using in GX Works3. If uninstalled elements are included, please upgrade the GX Works3 or Library.

The module FB shown in this message is not installed in GX Works3; therefore, it is not displayed in the [Module] tab in the element selection window.

To update the module FB, follow the procedure below.

Operating procedure


1. Select an upgraded module FB in the element selection window.

The module FB version can be checked with the last three characters of the function block name.

(Example: For 'M+RCPU_Msynchronization_Delay1OUT_00A,' '00A' indicates the version.)

2. Right-click it and select [Add to Project] from the shortcut menu.
3. Open the label editor where an FB instance of the module FB is registered.
4. Change the data type of the FB instance to the module FB added in the step 2.
5. Delete the definition of an unused module FB from "M_FBLIB" in the navigation window.
6. Convert the program.

Point

- When not updating an module FB, the project can be used as it is.
- The label editor where an FB instance is registered can be checked by searching for the module FB name with the character string search function. ( Page 466 Searching for/Replacing Character Strings)

Opening another format project

Projects created in other engineering tools can be opened and used in GX Works3.

In this manual, projects created in other engineering tools are referred to as other format projects; GX Works3 projects replaced with the project data are referred to as GX Works3 format projects.

When opening another format project in GX Works3, the CPU module type is changed to one which can be used in GX Works3.

This makes it possible to retain the project data of different CPU module series.

For details on the methods to open each 'other format project' and the data replacement, refer to the following:

| Other format project | Reference | |
|----------------------|--|---|
| GX Works2 | Page 110 Opening a GX Works2 format project | Page 940 Replacement of a GX Works2 format project |
| PX Developer | Page 113 Opening a PX Developer format project | Page 958 Replacement of a PX Developer format project |
| GX IEC Developer | Page 118 Opening a GX IEC Developer format project | |
| GX Developer | Page 127 Opening a GX Developer format project | Page 964 Replacement of a GX Developer format project |

Opening a GX Works2 format project

A project created in GX Works2 (GX Works2 format project) can be opened and used in GX Works3.

This function is supported in projects for the following modules only:

- Universal model QCPU
- High-speed universal model QCPU
- Universal model process CPU
- Redundant CPU
- LCPU
- FXCPU (FX3S, FX3U, FX3UC, FX3G, FX3GC)


The following shows the module type to be changed.

| Before change | After change ^{*1} |
|--|---|
| Universal model QCPU | R120CPU |
| High-speed universal model QCPU | |
| Universal model process CPU | R120PCPU (process mode) |
| Redundant CPU | R120PCPU (redundant mode) |
| LCPU | <ul style="list-style-type: none">• When opening a project in GX Works3 Version 1.087R or earlier: L16HCPU• When opening a project in GX Works3 Version 1.090U or later: L32HCPU |
| FXCPU (FX3S, FX3G, FX3GC, FX3U, FX3UC) | FX5SCPU ^{*2} , FX5UCPU, FX5UCCPU ^{*3} , FX5UJCPU |

^{*1} The new module type can be set in the "Select the New Module Type/Conversion Method" screen when opening a project for an FXCPU.


^{*2} Cannot be changed from an FX3U and FX3UC.

^{*3} To change the module type to an FX5UCCPU, set "Type" to "FX5U" in the "Select the New Module Type/Conversion Method" screen. After a project is opened, set the module name of an FX5UCCPU, and the project can be used as a project for the FX5UCCPU.


( Page 105 Specifying the specific model name of FX5CPU)

The supported versions of GX Works3 differs depending on the CPU module type set for a GX Works2 format project.

For details, refer to the following:

( Page 807 Additions and Changes from Previous Version)

For details on the data replacement which is necessary to use a GX Works2 format project in the GX Works3 format, refer to the following:

( Page 940 Replacement of a GX Works2 format project)

To use this function, the latest GX Works2 is required to be installed in a personal computer.


Operating procedure

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX Works2 Format] ⇒ [Open Project].
2. Select a project and click the [Open] button.
3. Read the displayed message, and click the [OK] button. ^{*1}
4. Read the displayed message, and select whether to read the sample comments of the CPU module.

The changes in project data are displayed in the "Output" window.

^{*1} The procedure differs when opening a project for an FX5CPU in GX Works3 Version 1.040S or later.

For details, refer to the following:

( Transition from MELSEC FX3G, FX3U, FX3UC Series to MELSEC iQ-F Series Handbook)

Precautions

A project which satisfies any of the following conditions cannot be opened in GX Works3. Check them and take corrective actions in GX Works2 in advance.

- A program where an error occurs in compiling exists: Check if the program can be compiled.
- User management settings or access authority settings are configured: Clear the settings.
- A project file is compressed (*.gwz): Decompress it.

The check function at a conversion of GX Works3 is enhanced compared to GX Works2. Therefore a conversion error may occur in a program in GX Works3 even if it does not occur in GX Works2. In that case, check the error content and correct the program.

Data to be changed

Some data is changed depending on the CPU module type set for a GX Works2 format project.

Data in a module which cannot be replaced with a module in MELSEC iQ-R series, MELSEC iQ-L series, or MELSEC iQ-F series will be deleted.

The following table shows data to be retained, returned to the default, or deleted.

| Operation in opening | Setting item in GX Works2 | | Remarks |
|--|--|---|----------------------------------|
| Changing in accordance with the target module type | • PLC parameter ^{*1} | PLC name ^{*3} | Check the settings in GX Works3. |
| | | PLC system ^{*2,*3} | |
| | | PLC file ^{*2} | |
| | | PLC RAS ^{*2,*3} | |
| | | Boot file | |
| | | Program ^{*3} | |
| | | SFC ^{*5} | |
| | | Device ^{*2} | |
| | | I/O assignment ^{*2,*3,*4} | |
| | | Multiple CPU ^{*2} | |
| | | Built-in Ethernet port ^{*2,*3} | |
| | | • Redundant parameter ^{*2} | |
| | Tracking ^{*3} | | |
| | • Network parameter | CC-Link IE Field ^{*1,*3} | |
| | | CC-Link IE Control ^{*1,*3} | |
| | | Ethernet ^{*1,*2,*3} | |
| | | CC-Link ^{*2,*3,*6} | |
| | | MELSECNET/H ^{*3} | |
| | | MELSECNET/10 ^{*3} | |
| | • Intelligent function module parameter ^{*1} | Input | |
| | | Output | |
| | | I/O | |
| | | Multiple input | |
| | | Interrupt input | |
| | | Analog input | |
| | | Analog output | |
| | | Analog I/O | |
| | | Temperature input | |
| | | Temperature control | |
| | | Simple motion | |
| | | Positioning | |
| | | Counter | |
| | | Channel isolated pulse input | |
| | | AnyWireASLINK | |
| | | Serial communication | |
| | • FB/FUN ^{*7} • Ladder program ^{*8} • ST programs • Structured ladder/FBD programs ^{*9} • SFC programs ^{*3,*5} • Device comments for devices other than special relays (SM) and special registers (SD) ^{*10} • Device memory (only when the module type is changed to an FX5UCPU or an FX5UCCPU) • Device/label automatic-assign | | |

| Operation in opening | Setting item in GX Works2 | | Remarks |
|---|--|------------------------|-----------------------------|
| Returning to the default/ deleting the data | <ul style="list-style-type: none">Options (other than "Reference/Reflection Target for Device Comment")System labelsDevice comments for special relays (SM) and special registers (SD)Remote password | | Set them in GX Works3. |
| Changing to the state in which a project was newly created | Connection destination | | |
| Deleting | <ul style="list-style-type: none">PLC parameter | Communication head | Not supported by GX Works3. |
| | | Built-in I/O function | |
| | | Serial communication | |
| | | Built-in serial | |
| | | Adapter serial | |
| | | Memory capacity | |
| | | Special function block | |
| | | Positioning | |
| | | Operation | |
| | <ul style="list-style-type: none">Programs of user library that are not registered to the program settingTaskProject revision | | |

*1 When opening a project for an FXCPU, the data returns to the default or is deleted.

*2 The items which are not supported by GX Works3 are deleted.

*3 Some setting items return to the default or the data is changed or deleted. Check and set them in GX Works3 after opening the project.

*4 When opening a project for a redundant CPU, settings for a base unit are deleted.

*5 To retain SFC programs in a project for an RCP, GX Works2 Version 1.535H or later is required to be installed in a personal computer.
To retain SFC programs in a project for an FX5CPU, GX Works2 Version 1.585K or later is required to be installed in a personal computer.

*6 When a local station is set in the "CC-Link Configuration," it will be changed to an intelligent device station. Check the station type.

*7 The ladder programs in function blocks that satisfy all of the following conditions are deleted.

·The function blocks are not used in other programs.

·An undefined FB instance or an FB instance whose definition is unclear exists.

*8 The ladder programs that satisfy any of the following conditions are deleted.

·1000 or more lines of statements are consecutively placed.

·An incorrect ladder exists. (Example: AND instruction is used at the top of the ladder block.)

*9 To retain Structured Ladder/FBD programs, GX Works2 Version 1.519R or later is required to be installed in a personal computer.

*10 When device comments are set in an FXCPU project, devices of M8000 and later will be replaced with SM8000 and later, and devices of D8000 and later with SD8000 and later; therefore, their device comments will be applied to that of the devices after the replacement.

For details, refer to the following:

 Transition from MELSEC FX3G, FX3U, FX3UC Series to MELSEC iQ-F Series Handbook

Opening a PX Developer format project

PX Developer format projects created in PX Developer (PX Developer projects and GX Works2 projects) can be opened and used in GX Works3.


This function is supported in projects for the following modules only:

- Universal model process CPU
- Redundant CPU

The following shows the module type to be changed.

| Before change | After change |
|-----------------------------|---------------------------|
| Universal model process CPU | R120PCPU (process mode) |
| Redundant CPU | R120PCPU (redundant mode) |

For details on the replacement of data which is necessary to use a PX Developer format project in the GX Works3 format, refer to the following:

 Page 958 Replacement of a PX Developer format project



To use this function, the latest PX Developer and GX Works2 are required to be installed in a personal computer.

Operating procedure

1. Select [Project] ⇒ [Open Other Format File] ⇒ [PX Developer Format] ⇒ [Open Project].
2. Select a project and click the [Open] button.
3. Read the displayed message, and click the [OK] button.
4. Read the displayed message, and select whether to read the sample comments of the CPU module and the initial values of FB properties.

The changes in project data are displayed in the "Output" window.

Precautions


- The following projects are opened in GX Works3:
 - Selected PX Developer project
 - GX Works2 project in the folder where the selected PX Developer project is stored (If multiple GX Works2 projects exist in the file, only the one with the same name as the PX Developer project is opened.)
- To open a project for which GX Developer is specified as the GX project type, change the project type to a GX Works2 project with the function to open a project of PX Developer Programming Tool. For details, refer to the following:
 -  PX Developer Version 1 Operating Manual (Programming Tool)
- To open a project for a process CPU, change the PLC type of the project to a universal model process CPU or a redundant CPU with the PLC type change function of PX Developer Programming Tool. For details, refer to the following:
 -  PX Developer Version 1 Operating Manual (Programming Tool)

Data to be changed (PX Developer)

Some data is changed depending on the CPU module type set for a PX Developer format project.

Some units of PX Developer project data are not supported by GX Works3. Set them in GX Works3 after opening the project.

For details, refer to the following:

 Page 958 Replacement of a PX Developer format project

The following table shows data to be retained or deleted.

| Operation in opening | Setting item in PX Developer | Remarks |
|--|--|----------------------------------|
| Changing in accordance with the target module type | Tag FB ^{*1} | Check and set them in GX Works3. |
| | Global variable ^{*2} | |
| | GX Works2 label assignment ^{*3,*4} | |
| | Program ^{*5,*6} | |
| | User-defined FB ^{*5,*6} | |
| | User-defined tag FB ^{*5,*6,*7} | |
| | User-defined structure | |
| | Program execution setting ^{*5,*8,*9} | |
| | Inline ST part | |
| | Function element/FB element ^{*10} | |
| | Project parameter ^{*11} | |
| | Initial value of an FB property ^{*12} | |
| Deleting | Module FB declaration ^{*13} | Set them in GX Works3. |
| | I/O simulation setting | |

*1 The tag FB setting is not applied in the following cases. Click the [Check] button on the tag FB setting editor in GX Works3, then check and set the data.

- A tag name which cannot be set in GX Works3 is used.
- Any one of "PFC_INT," "PFC_SF," or "PFC_SS" is used for the tag type.

*2 Converted into the global label "Global_PX" of GX Works3.

*3 Converted into the global label "GXW2LabelAssignment_PX" of GX Works3.

*4 Replace a global label name used in GX Works2 in a program with a global variable name used in PX Developer.

*5 The execution condition settings of a program and an FBD sheet are converted into comment elements of a program editor.
A comment element is displayed in the installed PX Developer language.

*6 The color set in the "Color and Font" screen of GX Works3 is applied to comment elements.

*7 The tag type "PFC_INT," "PFC_SF," and "PFC_SS" are not supported.

*8 A process control function block is added to a project.

*9 A program to execute the interrupt pointer is converted into a program the execution type of which is "No Execution Type."

*10 The following process functions in a PX Developer project are read as function blocks.

P_HS, P_HS_E, P_LS, P_LS_E, P_MID, P_MID_E, P_AVE, P_AVE_E, P_ABS, P_ABS_E

*11 The items which are not supported by GX Works3 are deleted.

*12 When the initial values of FB properties are not read, the initial values of the FB properties will be returned to default.

*13 A module FB element in an FBD program is changed to a module FB in an FBD/LD program of GX Works3; however the data cannot be used.

After opening the project, delete the module FB in the FBD/LD program.

■Registration destination of a program

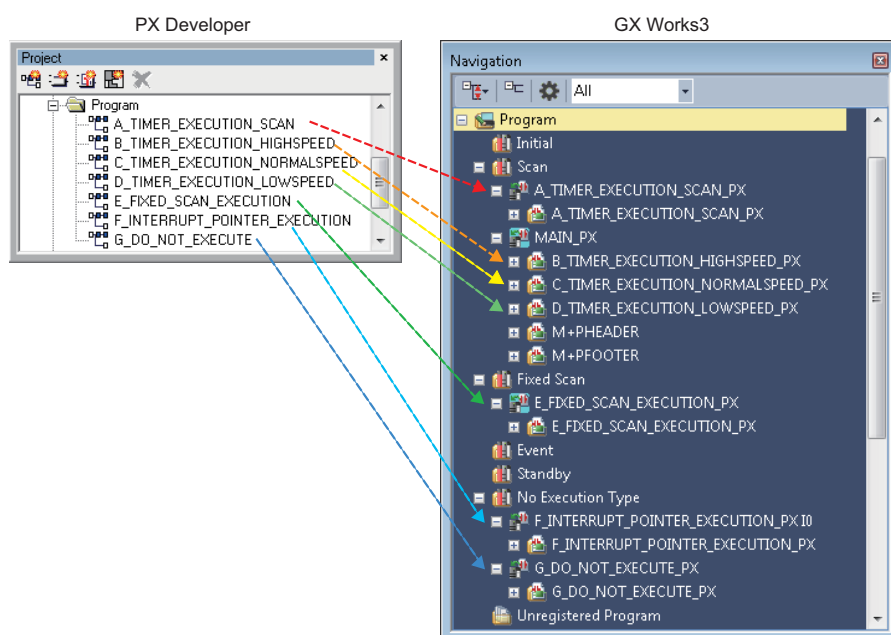
For a program of a PX Developer project, the registration destination in GX Works3 differs depending on the execution state and the execution type set for the program.

| Setting content in PX Developer | | Registration destination in GX Works3 | | |
|---------------------------------|---|---------------------------------------|---|----------------------|
| Execution state | Execution type | Execution type | Setting for "Use the process control extension" | Program file name |
| Execute/execute conditionally | Timer execution (scan) | Scan | No | Program name + '_PX' |
| | Timer execution (high-speed/normal speed/low-speed) | Scan | Yes | MAIN_PX |
| | Fixed scan execution | Fixed scan | Yes | Program name + '_PX' |
| | Interrupt pointer execution ^{*1} | No execution type | No | Program name + '_PX' |
| Do not execute | — | No execution type | No | Program name + '_PX' |

*1 An interrupt pointer set in PX Developer is added to a title of a program file. (📖 Page 144 Title)

Ex.

The following figure shows a registration example.



■Execution condition settings

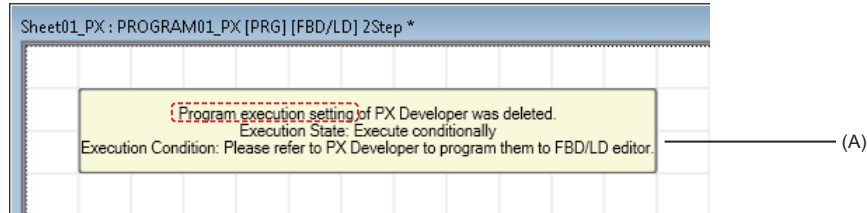
The execution condition settings of a program and an FBD sheet are converted into comment elements.

(1) Execution condition setting of a program

It is converted into the comment element (A) on the upper left of the first worksheet.

Ex.

The following figure shows a conversion example.

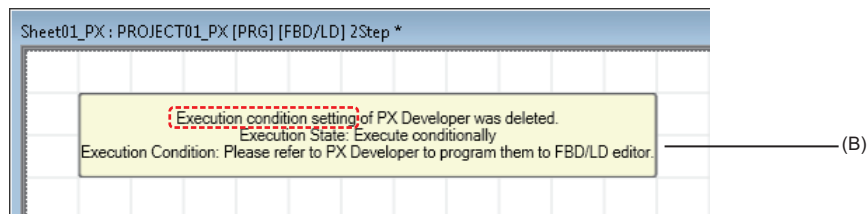


(2) Execution condition setting of an FBD sheet

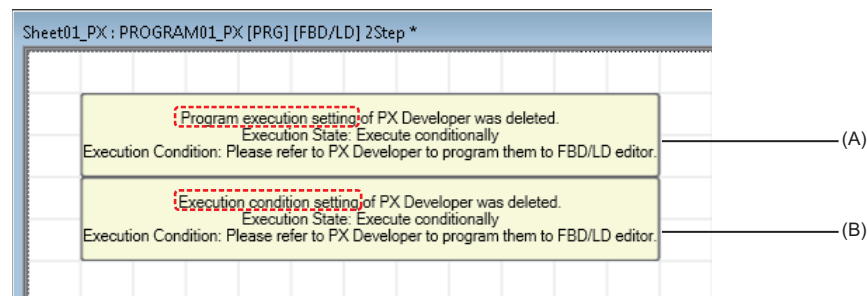
It is converted into the comment element (B) on the upper left of a worksheet.

Ex.

The following figure shows a conversion example.



When both (1) and (2) are set, (B) is displayed under (A).



■Label area capacity

The following data is applied to "Label Area Capacity" or "Latch Label Area Capacity" in the CPU parameters of a GX Works3 format project.

| Parameter in GX Works3 | Capacity |
|---------------------------|--|
| Label area capacity | Capacity that is calculated based on the capacity in a PX Developer project ^{*1} + Capacity that is calculated based on the capacity in a GX Works2 project ^{*2} |
| Latch label area capacity | Capacity that is calculated based on the capacity in a PX Developer project ^{*1} + Capacity that is calculated based on the capacity in a GX Works2 project ^{*3} |

- *1 Capacity that is calculated based on the number of points for file registers and timers set in the system resource of the project parameter in a PX Developer project.
- *2 Capacity that is calculated based on the total number of points for each device (for VAR) set in the device/label automatic-assign in a GX Works2 project
- *3 Capacity that is calculated based on the total number of points for each device (for VAR_RETAIN) set in the device/label automatic-assign in a GX Works2 project

Precautions

When a PX Developer format project is opened in GX Works3, "0 K Word" may be set for "Label Area Capacity" and "Latch Label Area Capacity."

For details, refer to the following:

☞ Page 963 Label area capacity

Data to be changed (GX Works2)

To retain data in a GX Works2 project used in a PX Developer format project, refer to the following:

☞ Page 111 Data to be changed

Data satisfying the following conditions are deleted.

| Condition | Data to be deleted |
|------------------------------------|--------------------|
| The data name starts with "#FBDQ." | Program file |
| | Program block |
| | Program setting |
| The data name matches "#FBDQ." | Global label |

Considerations

■Tag names that cannot be set in GX Works3

Some tag names set in a PX Developer format project are not applied to a tag FB setting in GX Works3; therefore, the FB property initial value is returned to the default.

In that case, change the tag name in PX Developer to the one available in GX Works3.

After changing the tag name, open the PX Developer format project in GX Works3 again.

For details, refer to the following:

☞ Page 962 Tag names that cannot be set in GX Works3

■Data name duplication

Data names of a PX Developer format project are changed when opening the project in GX Works3.

Therefore, a data name may be duplicated and the project data changes may be canceled. In this case, correct the data name in PX Developer and open the project in GX Works3 again.

For details, refer to the following:

☞ Page 963 Data name duplication

Opening a GX IEC Developer format project

A project created in GX IEC Developer (GX IEC Developer format project) can be opened and used in GX Works3. This function can be used for an ASCII format file and an SUL format file created in GX IEC Developer version 7.04 is supported.

Enabling this function is required for opening a GX IEC Developer format project:

Log on to a personal computer as a user with the administrator authority, then execute "GIDImport.exe" in the installation DVD (Disk1\GXW3\Others) of GX Works3 without starting GX Works3.

Operating procedure

■If a GX Works3 format project is open

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX IEC Developer Format] ⇒ [Open ASC Format File].
2. Select a project and click the [Open] button.
3. Read the displayed message, and click the [OK] button.

The GX IEC Developer format project data is imported to the open GX Works3 format project.

■If a GX Works3 format project is not open

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX IEC Developer Format] ⇒ [Open ASC Format File].
2. Select a project and click the [Open] button.
3. Read the displayed message, and click the [OK] button.

The "New" screen appears.

4. Set each items in the "New" screen, and click the [OK] button.

The GX IEC Developer format project data is imported to the newly created GX Works3 format project.

Point

- The changes in project data are displayed in the "Progress" window and the "Output" window. Check the logic of the project and the program before and after the change, and modify the data as necessary.
 - "Imported from GX IEC Developer project: "(name of an ASCII format file).asc"" is entered on the [Comment] tab in the "Properties" screen of a GX Works3 format project.
-


Precautions


- If the CPU module type set for a GX Works3 format project does not support Sequential Function Chart language, POUs created in the language are not imported.


- Devices and instructions which are not supported by GX Works3 may not be converted properly.

Refer to the following manuals to change them to equivalent elements supported by GX Works3 and correct a program.

 GX IEC Developer Version7 Reference Manual

 User's manual of each module

 MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

 MELSEC iQ-R Programming Manual (Module Dedicated Instructions)


- Devices in address representation (such as %MX0.1) will be converted into device representation. Inconvertible devices into address representation will be read as they are.
- If the CPU module type set for a GX Works3 format project does not support functions or function blocks used in a GX IEC Developer format project, these elements will be converted into ones whose definitions are unclear.
- When an IL/MELSEC IL program is converted into an FBD/LD program of GX Works3, the numbers of parameters of functions may not match between the GX IEC Developer format project and the GX Works3 format project.
In this case, the functions keep the number of parameters of the GX IEC Developer format project and are converted into ones whose definition is unclear.
- Module type change will be canceled if the [Cancel] button in the progress dialog, which is displayed during the processing, is clicked.

Data which has already been replaced in a GX Works3 format project before the cancellation will not be deleted.

Data to be changed

Some data is changed depending on the module type set in a GX IEC Developer format project.

The following table shows data to be retained, returned to the default, or deleted.

| Operation in opening | Setting item in GX IEC Developer | Remarks |
|--|---|---|
| Changing in accordance with the target module type | Program POU ^{*1} | Check the settings after the change. |
| | Function POU ^{*1} | |
| | Function Block POU ^{*1} | |
| | POU (FBD) | |
| | POU (LD) | |
| | POU (ST) | |
| | POU (SFC) ^{*2} | |
| | POU (IL/MELSEC IL) | |
| | SFC action (FBD) ^{*2} | |
| | SFC action (LD) ^{*2} | |
| | SFC action (ST) ^{*2} | |
| | SFC action (IL/MELSEC IL) ^{*2} | |
| | SFC transition (FBD) ^{*2} | |
| | SFC transition (LD) ^{*2} | |
| | SFC transition (ST) ^{*2} | |
| | SFC transition (IL/MELSEC IL) ^{*2} | |
| | Data Unit Type/Structured Data Type ^{*1} | |
| | Global variables ^{*3} | |
| | Task ^{*1} /Program File | |
| | User Library | |
| Returning to the default/ deleting the data | CPU Parameter | To create a GX Works3 format library from a GX IEC Developer format library, refer to the following:  Page 530 Creating a GX Works3 format library from a GX IEC Developer format library |
| | System Parameter | |
| | Network Parameter | |
| | Module Parameter | |
| | Connection Settings | |
| | Entry Data Monitor/Watch | |
| | Options | |

*1 If the same data name exists in a GX Works3 format project, the name of the data in the GX IEC Developer format project to be imported is incremented. (Example: Item_1→Item_2)

*2 Data is deleted if the CPU module type set for a GX Works3 format project does not support Sequential Function Chart language.

*3 The global variables of GX IEC Developer are defined as global labels in "Global" only when no global label exists in "Global (Global Label Setting)" in a GX Works3 format project.

When any global label exists in "Global," a new global label setting is created.

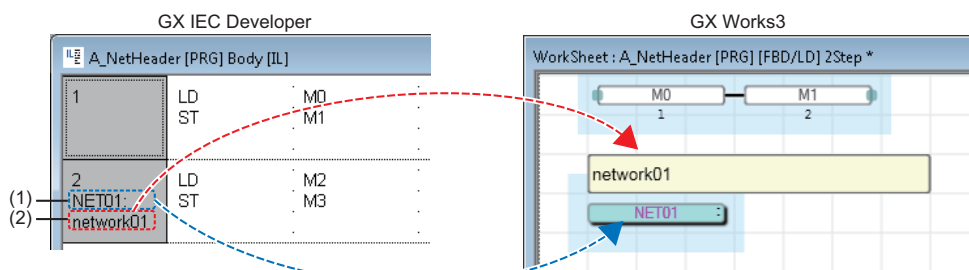
IL/MELSEC IL programs

An IL/MELSEC IL program is converted into an FBD/LD program of a GX Works3 format project, and the character string "Imported from GX IEC Developer (IL/MELSEC IL)" is inserted as a comment element on the upper left of the first worksheet. Each element used in the program is converted as shown below.

■Network header

A network label which was set in the IL/MELSEC IL program (1) is converted into a jump label element.

The title of the network header (2) is converted into a comment element.

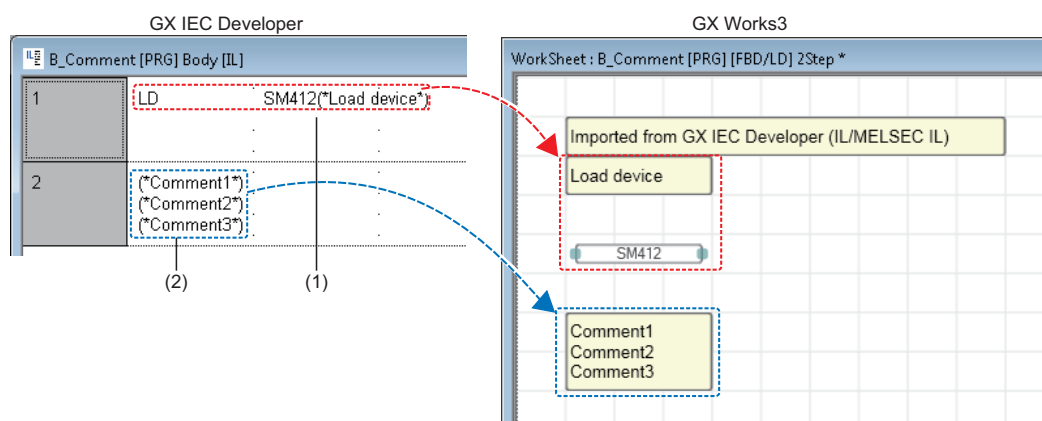


■Comment

A comment described in the same row as the instruction (1) is converted into a comment element and placed on a variable element.

Sequential comments in a network (2) are combined into a single comment element.

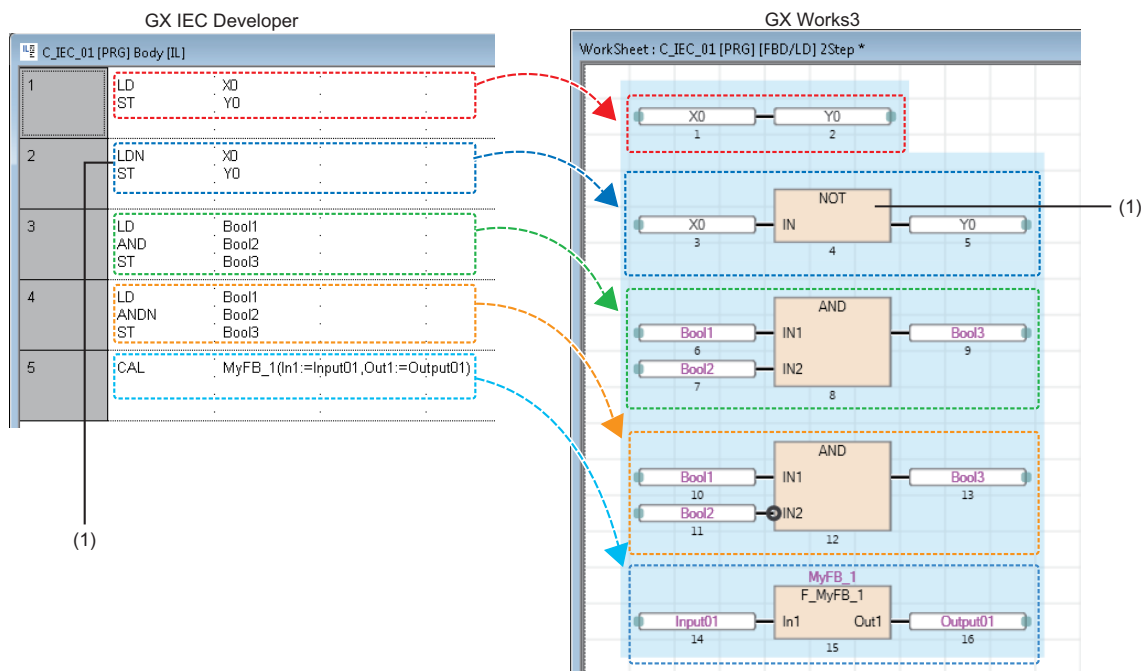
At the time, '(*' and '*)' enclosing a comment are deleted. (Example: (*Comment*) → Comment)



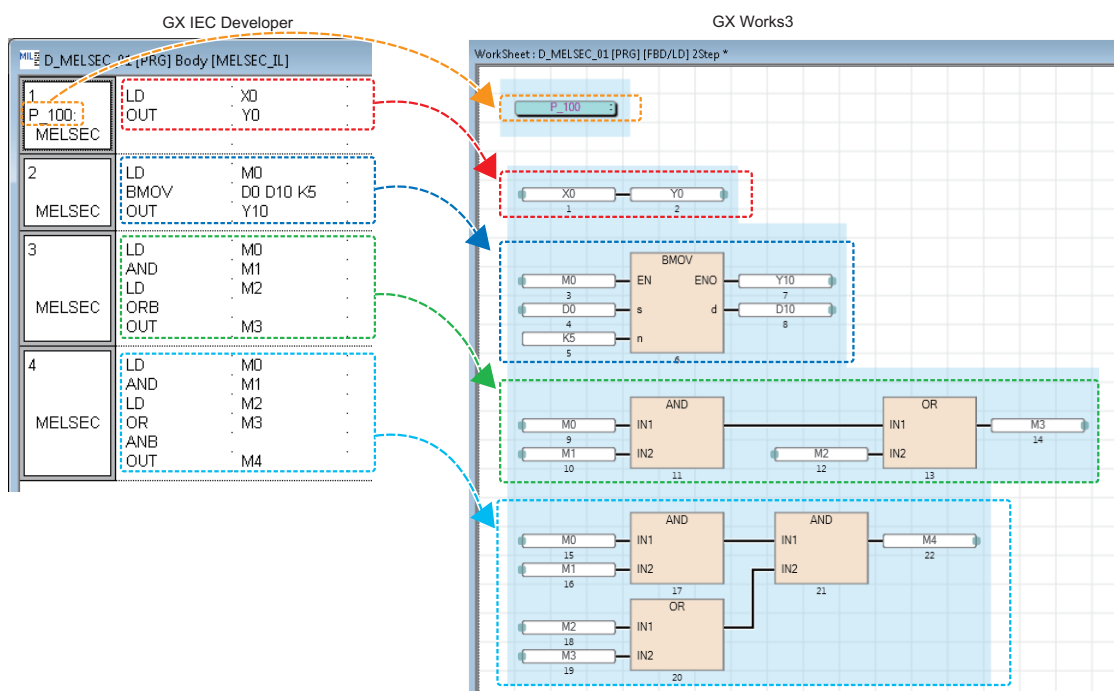
■ Programming instructions

Program instructions used in a GX IEC Developer format project are converted into the ones available in GX Works3. The following figures show a conversion example of programming instructions.

- IEC programming instructions



- MELSEC programming instructions

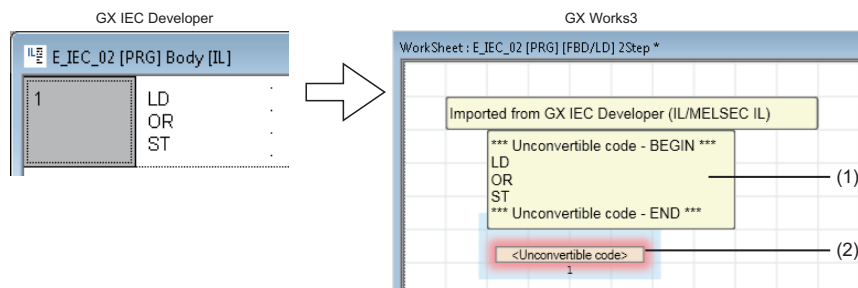


Precautions

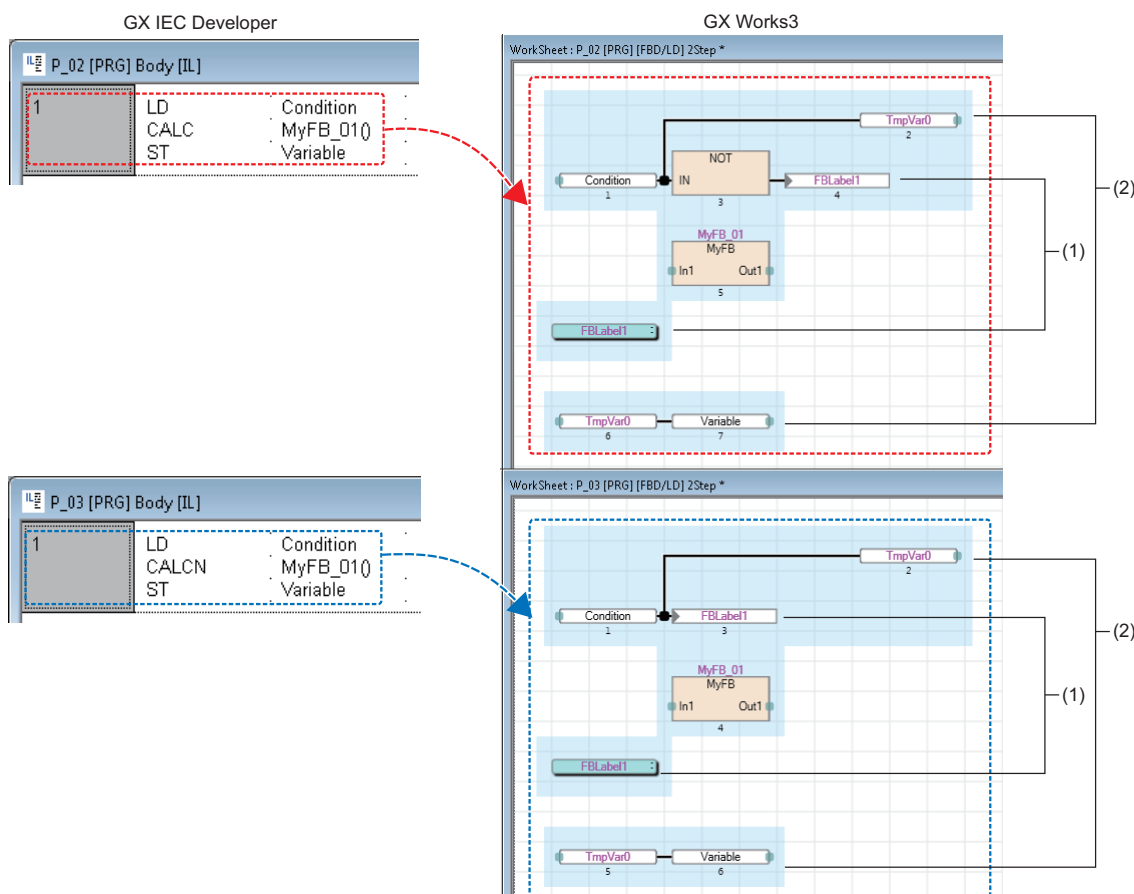
When an error occurs in a program, POU's may not be converted properly.

Correct the program in GX Works3.

- When there is no operand and variable of a programming instruction, the instruction is converted into a comment element (1) and an undefined POU (2).



- When there is a CALC/CALCN instruction, a label (1) and a temporary variable element (2) are automatically registered as local labels.



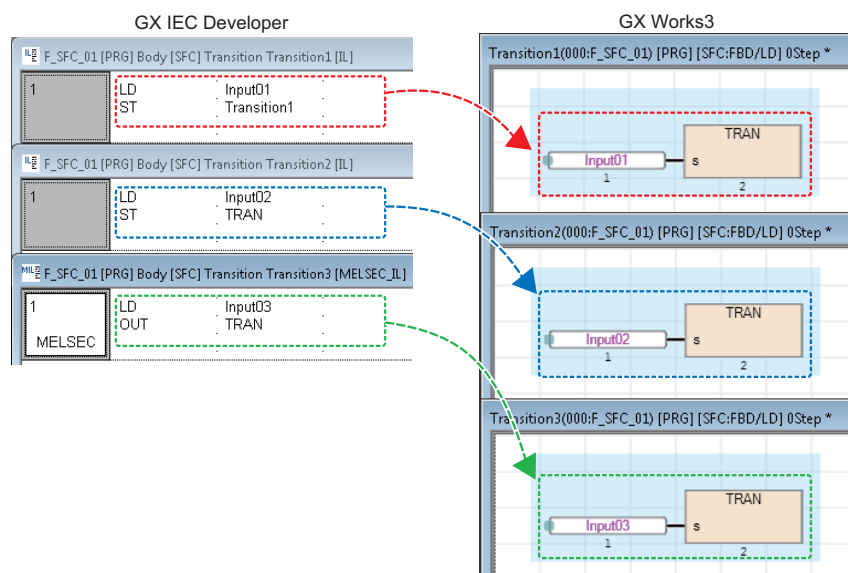
Actions/transitions (IL/MELSEC IL)

Actions and transitions of an SFC program created in IL/MELSEC IL language are converted into ones of an SFC program created in Function Block Diagram/Ladder Diagram language.

To convert actions/transitions created in IL/MELSEC IL language, the following instructions are required at the end of the program.

- IL language: ST instruction that a transition name or the SFC dedicated instruction "TRAN" is used for the variable
- MELSEC IL language: OUT instruction that the SFC dedicated instruction "TRAN" is used for the variable

The programs of the actions/transitions are converted into ones to call the function "TRAN."



Global variables

Global variables in a GX IEC Developer format project are converted into global labels of a GX Works3 format project only when no global label exists in "Global (Global Label Setting)" in a GX Works3 format project.

When a global label exists in "Global," a new global label setting is created; however, it is not converted into a global label of the GX Works3 format project.

Add the global variables set in a GX IEC Developer format project to the global label setting in GX Works3 by the following procedure.

Operating procedure

1. In GX IEC Developer, export "Global_Vars" to an ASCII format file.
2. Open the file exported in step 1 in GX Works3.
Up to 20479 global variables are added to the global label setting in GX Works3.
To add 20480 or more global variables to the global label setting of GX Works3, follow the procedure below.
3. Change the name of the global label setting added in step 2. (Example: Global→Global_1)
4. Open the file exported in step 1, and delete 20480 global variables which were added to the global label setting of GX Works3.
5. Open the file exported in step 4 in GX Works3.

Function

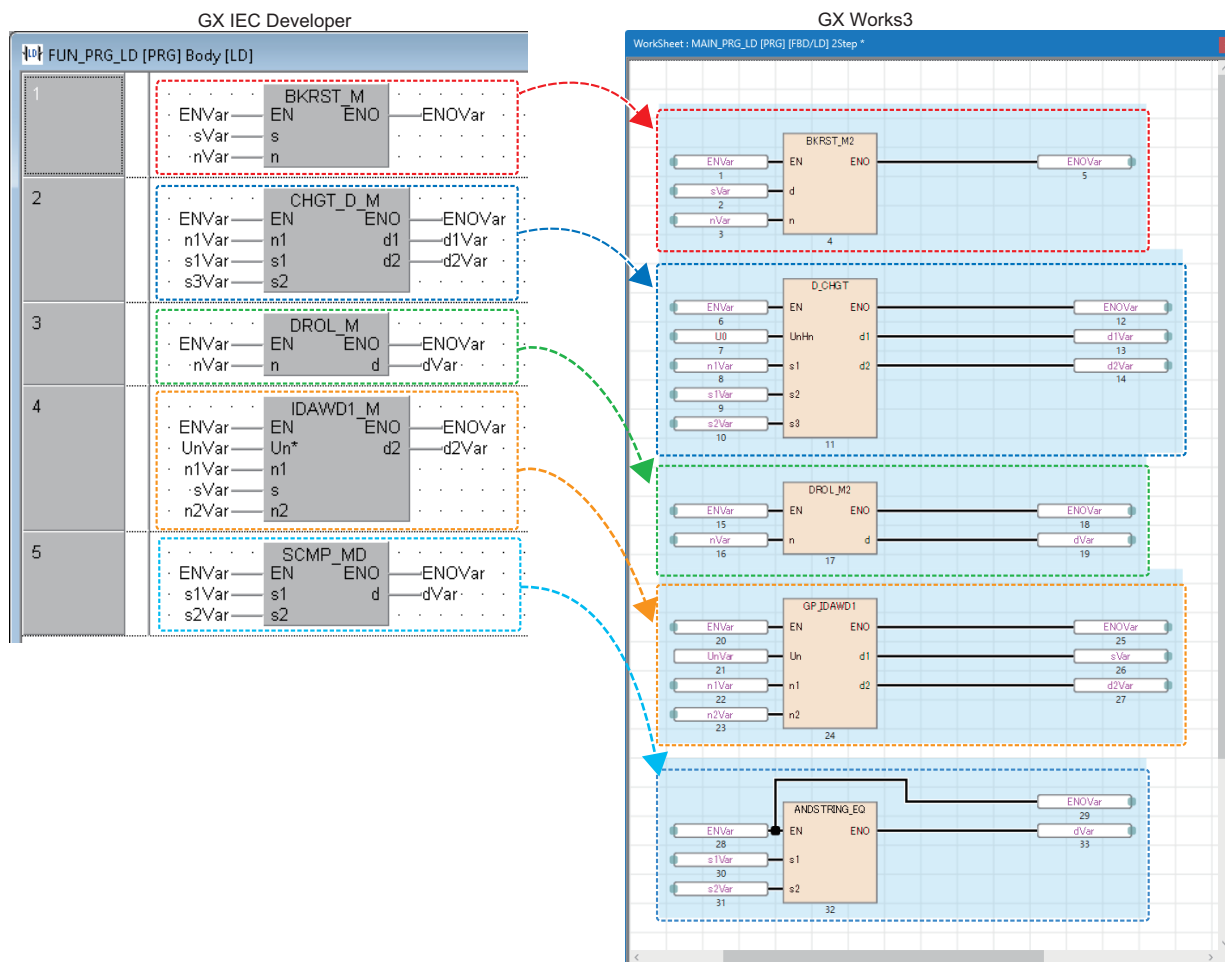
Functions used in a GX IEC Developer format project are converted into the ones available in GX Works3.

The order and position of input/output arguments may differ between a GX IEC Developer format project and a GX Works3 format project.

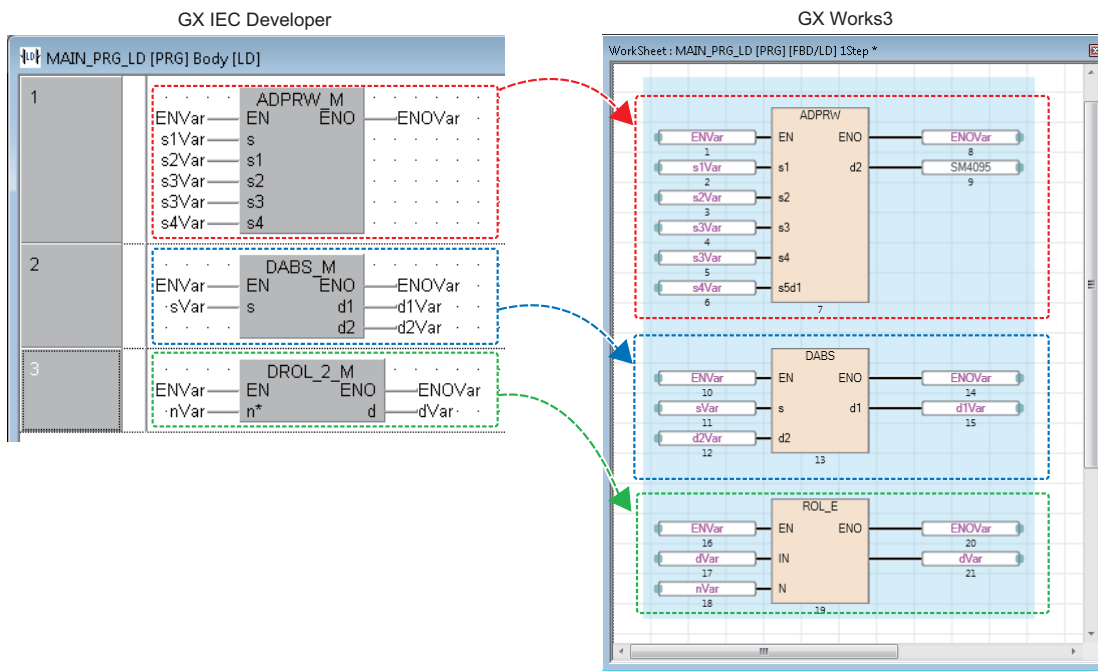
The changes in each function can be checked in the information in the "Output" window.

The following figures show a conversion example of functions used in "Ladder Diagram(LD)" in GX IEC Developer.

- Functions of MELSEC-Q series



- Functions of MELSEC iQ-F series




Opening a GX Developer format project


A project created in GX Developer (GX Developer format project) can be opened and used in GX Works3.
 This function can be used in a project for QSCPU only.
 The following shows the module type to be changed.

| Before change | After change |
|---------------|--------------|
| QSCPU | R120SFCPU |

For details on the replacement of data which is necessary to use a GX Developer format project in the GX Works3 format, refer to the following:

 Page 964 Replacement of a GX Developer format project

Operating procedure

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX Developer Format] ⇒ [Open QSCPU Series Project].
2. Select a project and click the [Open] button.
3. Enter the user name and password of a GX Developer format project in the "User Authentication (Project)" screen, and click the [OK] button.
4. Read the displayed message, and click the [OK] button.
5. Register a new user in a GX Works3 format project. ( Page 106 Adding a new user)
6. Read the displayed message, and click the [OK] button.

The changes in project data are displayed in the "Output" window.

Data to be changed

The following table shows data to be changed when opening a GX Developer format project.

Data of modules that cannot be replaced with MELSEC iQ-R series modules will be deleted.

| Operation in opening | Setting item in GX Developer | | Remarks | |
|--|---|--------------------------------------|----------------------------------|--|
| Changing in accordance with the target module type | PLC parameter | PLC name | Check the settings in GX Works3. | |
| | | PLC system | | |
| | | PLC RAS | | |
| | | Device | | |
| | | I/O assignment ^{*1,*2} | | |
| | | Safety setting ^{*3} | | |
| | Network parameter ^{*1} | Ethernet ^{*3} | | |
| | | CC IE Control(Normal station) | | |
| | | CC IE Field (Local station) | | |
| | <ul style="list-style-type: none">• Ladder program^{*4}• Device comments for devices other than special relays (SM) and special registers (SD)• Device memory^{*1}• User-defined FB^{*5}• Structure• Global variables• Local labels | | | |
| Deleting the definition ^{*6} | Safety FB | | Redefine them in GX Works3. | |
| Returning to the default/ deleting the data | PLC parameter | Boot file setting | Set them in GX Works3. | |
| | Network parameter | CC IE Field(Master station [Safety]) | | |
| | | CC IE Field(Local station [Safety]) | | |
| | | CC-Link | | |
| | <ul style="list-style-type: none">• Options (other than "Reference/Reflection Target for Device Comment")• Device comments for special relays (SM) and special registers (SD)• Remote password• User information (user name/password/access level) | | | |
| Changing to the state in which a project was newly created | Connection destination | | | |

*1 Some setting items return to the default or the data is deleted. Check and set them in GX Works3 after opening the project.

*2 When switch settings are configured without setting network parameters, the switch settings are deleted.

*3 The items which are not supported by GX Works3 are deleted.

*4 Replaced with a standard program.

*5 Replaced with a standard FB.

*6 Data on a ladder program is not deleted.

Saving a project

Save the project on the personal computer or another data storage device.

Depending on the setting for "MELSOFT iQ AppPortal information file output when saving project," an iQ AppPortal information file can be output when saving a project.

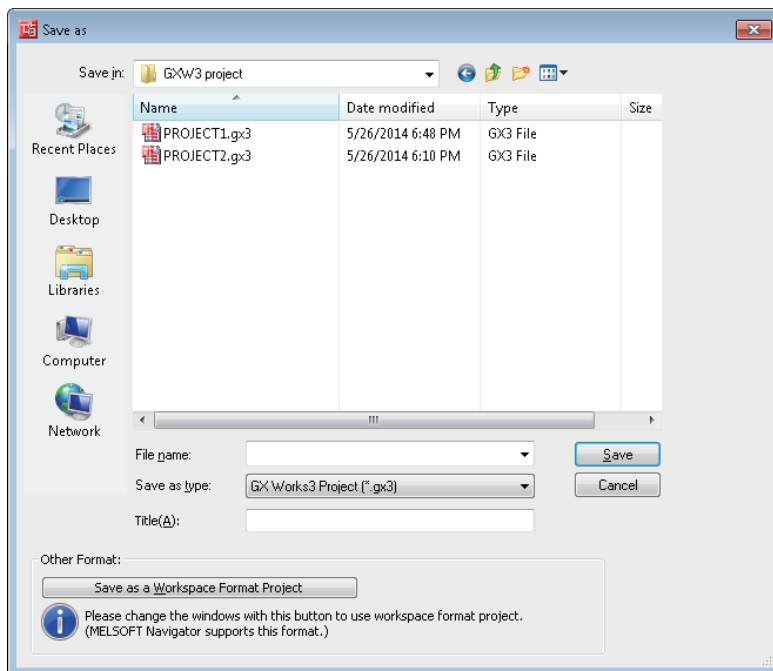
For details, refer to the following:

☞ Page 145 Settings for MELSOFT iQ AppPortal

Saving projects under the specified name

Window

Select [Project] ⇒ [Save As].



When saving the project with the workspace format, click the [Save as a Workspace Format Project] button to switch the screen.

Operating procedure

Set each item and click the [Save] button.

Point

When saving a project that has been opened in the Q/L/FX series compatibility mode in GX Works3, any of the following format can be selected in "Save as type" in the "Save as" screen.

- GX Works3 Project (*.gx3)
- GX Works2 Project (*.gxw)

Precautions

For details on the unusable character strings for a project, workspace, or path name, refer to the following:

☞ Page 925 Unusable Character Strings (Reserved Words)

Overwriting projects

Operating procedure

Select [Project] ⇒ [Save] (💾).

Point

A project can be automatically overwritten by setting the following option:

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Save" ⇒ "Auto-save Execution Setting"/"Auto-save Operational Setting"

■Registering a revision

A project revision can be registered when the project is overwritten.

For details, refer to the following:

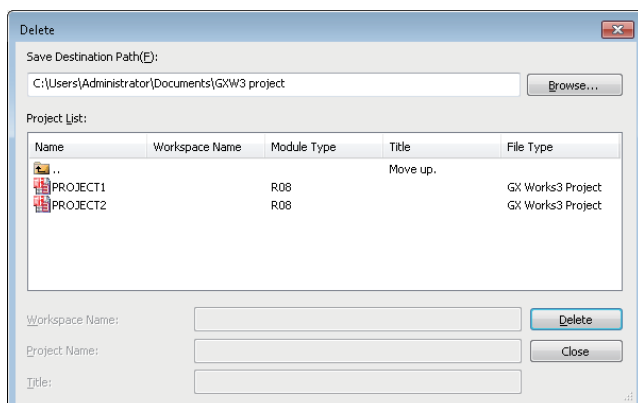
📖 Page 169 Registering a revision when a project is overwritten

Deleting a project

Delete a project saved on the personal computer or another data storage device.

Window

Select [Project] ⇒ [Delete].



Operating procedure

Select a project (📁) to be deleted, and click the [Delete] button.

Precautions

When a project file does not exist after deleting a workspace format project, the message appears to confirm whether to delete the workspace itself. If the project is deleted, the workspace folder is deleted, but 'workspacelist.xml' remains.

In addition, when deleting a project, the corresponding iQ AppPortal information file is also deleted.

3.3 Creating Data

This section explains the creation method of each data.

Data

■Unusable character strings

Refer to the following:

☞ Page 925 Unusable Character Strings (Reserved Words)

■Maximum number of units of data that can be created in one project (RCPU/LHCPU/FX5CPU)

The following table shows the maximum number of units of data that can be created for each data type.

| Data type | RCPU | | | | LHCPU | | FX5CPU |
|-----------------------------|------------------|--------|--------|--------|---------|-------------------------------|--------|
| | R00CPU R01CPU | R02CPU | R04CPU | Others | L04HCPU | L08HCPU L16HCPU L32HCPU | |
| Program file | 32 | 64 | 124 | 252 | 124 | 252 | 32 |
| FB file and FUN file | 16 | 32 | 64 | 128 | 64 | 128 | 15 |
| Function block and function | 4096 | | | 8192 | 4096 | 8192 | 960 |
| Initial device value | 800 | | | | | | 1 |
| Program block | 2048 | | | | | | |
| Common device comment | 1 | | | | | | |
| Each program device comment | 800 | | | | | | |
| Global label | | | | | | | |
| Structure | | | | | | | |
| Device memory | | | | | | | |

Precautions

For data names, use characters in the Unicode Basic Multilingual Plane.



If an input language is different from the language set in the regional settings on Windows, some functions may not operate properly. In that case, unify these languages.

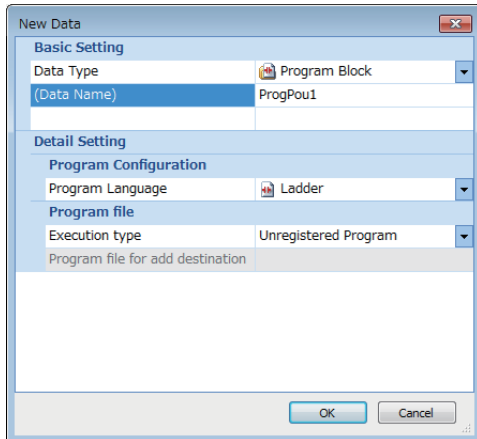
If the characters outside the Unicode Basic Multilingual Plane are specified, the program may not operate properly.

Creating data

Create new data in a project.

Window

1. Select data in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [New Data] ().
Alternatively, right-click it and select [New Data] () from the shortcut menu.



In a safety project, the "Category" column to select "Standard," "Safety," or "Standard/Safety Shared" is displayed. For details on the data to select, refer to the following:

☞ Page 30 Safety system

Operating procedure

Set each item and click the [OK] button.

For the setting items when "Function Block" or "FB File" is selected for "Data Type," refer to the following:

☞ Page 506 Creating a new function block

For the setting items when "Function" is selected for "Data Type," refer to the following:

☞ Page 525 Creating a function


Precautions

- When function block and function data are added by the above method, the FB file and FUN file will be in the unconverted state.
- SFC data and program blocks written in programming languages except for SFC (Ladder, ST, FBD/LD) cannot exist in a same program file.

Editing data

Changing a data name

Operating procedure

1. Select the data to change its name in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Rename], or right-click in the navigation window and select [Rename] from the shortcut menu.
3. Change the data name and press the  key.





Copying and pasting data

Utilize the data of project being edited or other projects.

Elements can be pasted only to the place where is able to create the same type of data.

Data may cannot be pasted to a project with a different series or module type of a CPU module.

Operating procedure

1. Select the data of the copy source in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Copy Data] () , or right-click in the navigation window and select [Copy Data] () from the shortcut menu.
3. Select a folder to paste the data (one-level upper hierarchy of the copy source data) in the navigation window or other projects.
4. Select [Project] ⇒ [Data Operation] ⇒ [Paste Data] () , or right-click in the navigation window and select [Paste Data] () from the shortcut menu.
5. If the paste destination includes data with the same name that can be overwritten, read the displayed message and click the [Add]/[Overwrite] button.

When clicking the [Add] button in the displayed message, the name of the pasted data is automatically set.

Even if the paste destination includes data with the same name that cannot be overwritten, the pasted data is automatically set.

Point

If data cannot be pasted with this function, it can be utilized by opening each editor and copy the corresponding data.

Precautions

- The pasted program will be in the unconverted state.
- Structures and function blocks used in the global label are not copied.
If the same structure or function block name does not exist in the paste destination, the data type of the global label will be changed to an undefined one.
- Pasting of global label data is canceled when the maximum number of labels (20480) is exceeded. Adjust the number of global labels in the copy destination and the copy source, and retry pasting data.
- If data is overwritten, allocation of the data with the same name may be changed in the paste destination.
- If the data is overwritten, the execution order of the program may be changed. Check the execution order by either of following operations:
 - Double-click "Parameter" ⇒ "(CPU module name of the project)" ⇒ "CPU parameter" ⇒ "Program Setting" ⇒ "Program Setting"
 - Select and right-click a program file in the navigation window, then select [Program File Setting] from the shortcut menu.
- If a file or folder is overwritten, data that exists only in the paste destination remains even after the paste.
- If function blocks/functions used in a ladder program are overwritten, they are changed to undefined function blocks/functions.

■Program file

A program block under the selected program file is copied when copying a program file.

A common device comment can also be copied by setting the following option when pasting the data to other projects.

Set it in the project of a copy source.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Copy" ⇒ "Operational Setting"

■Copying a program body

For an ST program and FBD/LD program, a program body can be copied and pasted onto the data created in the same programming language.

Even if the data type of a copy destination and source differ, the program can be pasted.

■Module FB

When copying and pasting a program block including a module FB to another project, the definition of the module FB is automatically added in the navigation window of the paste destination.

Precautions

- When pasting a program block, a module FB on a ladder program is pasted as a function block whose definition is unclear.
- If a program block including a module FB is copied and pasted to another project on the program configuration diagram, or a module FB does not exist in the element selection window of the paste destination, the definition of the module FB is not added in the navigation window.

In this case, import the module FB in the project, then drag and drop the module FB from the element selection window onto the navigation window. (☞ Page 521 Importing module FBs in a project, Page 524 Adding the definition of a module FB)

■CPU module type combinations

The following table shows the combinations of the module types in which data can be copied and pasted.

○: Can be copied and pasted, ×: Cannot be copied and pasted

| Copy source | Copy destination | | | | | | | | | | |
|---------------------|------------------|---------|--------|---------|----------|--------------------|-------|---------------------|-----------|----------|-------|
| | RnCPU | RnENCPU | RnPCPU | RnSFCPU | RnPSFCPU | Remote head module | LHCPU | FX5UCPU FX5UCCPU | FX5UJ CPU | FX5S CPU | NCCPU |
| RnCPU | ○*1 | ○*2 | × | × | × | × | × | × | × | × | × |
| RnENCPU | ○*2 | ○ | × | × | × | × | × | × | × | × | × |
| RnPCPU | × | × | ○ | × | × | × | × | × | × | × | × |
| RnSFCPU | × | × | × | ○ | × | × | × | × | × | × | × |
| RnPSFCPU | × | × | × | × | ○ | × | × | × | × | × | × |
| Remote head module | × | × | × | × | × | ○ | × | × | × | × | × |
| LHCPU | × | × | × | × | × | × | ○ | × | × | × | × |
| FX5UCPU FX5UCCPU | × | × | × | × | × | × | × | ○ | ○ | ○ | × |
| FX5UJ | × | × | × | × | × | × | × | ○ | ○ | ○ | × |
| FX5S | × | × | × | × | × | × | × | ○ | ○ | ○ | × |
| NCCPU | × | × | × | × | × | × | × | × | × | × | ○ |

*1 For R00CPU, R01CPU, and R02CPU, data can be copied and pasted only in the following combinations:

- R00CPU and R00CPU
- R01CPU and R02CPU

*2 Excluding R00CPU, R01CPU, and R02CPU.

■When CPU module types are different

Only the following data can be copied and pasted:

- Program file
- Program block
- Worksheet
- User folder
- FB file
- Function block
- FUN file
- Function
- Global label
- Structure

Adding worksheets

A worksheet (program body) of a POU (program block, function block, and function) can be added.
This operation is applied to a POU used in an ST program and FBD/LD program.

Operating procedure

1. Select a POU to which the worksheet is to be added in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Add New Worksheet], or right-click in the navigation window and select [Add New Worksheet] from the shortcut menu.

Deleting data

Data can be deleted from the open project.

Operating procedure

1. Select data to delete in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Delete Data], or right-click in the navigation window and select [Delete Data] from the shortcut menu.

Importing data (Simulink PLC Coder XML format)

This section shows the method to import the following data from an XML file output with Simulink® PLC Coder™ to a project.

- POU (program block, function block, function, program body, local label)
- Global label
- Structure

Operating procedure

1. Select [Project] ⇒ [Import File] ⇒ [Simulink PLC Coder XML Format].
2. Select a file to import in the "Import File" screen.
3. Click the [Open] button.

Precautions

- Only an XML file output with Simulink PLC Coder can be imported.
- Do not edit an XML file output with Simulink PLC Coder. Otherwise, the file may not be imported properly.
- When a program is being monitored or simulated, a file cannot be imported.

Importing data (IEC61131-10 XML format)

This section shows the method to import the following data from an XML file compliant with IEC61131-10 to a project.

- POU^{*1} (program block, function block, function, program body, local label)
- Global label
- Structure
- Files (program file, FB file, FUN file)
- Folder

^{*1} Only data in Structured Text is imported.

Operating procedure

The following table shows the two methods for importing data from an XML file.

Note that data to be imported differs depending on the data selected in the navigation window.

| Method | Selected data | Data to be imported | Reference |
|-----------------------------------|--------------------------|---|---|
| To import all the importable data | Project | <ul style="list-style-type: none">• POU^{*2} (program block, function block, function, program body, local label)• Global label• Structure• Files (program file, FB file, FUN file)• Folder | Page 138 Importing all data |
| | Other data ^{*1} | | |
| To import only the selected data | Program folder | <ul style="list-style-type: none">• POU^{*2} (program block, program body, local label)• File (program file)• Folder | Page 139 Importing only the selected data |
| | FB/FUN folder | <ul style="list-style-type: none">• POU^{*2} (function block, function, program body, local label)• Files (FB file, FUN file) | |
| | Global label folder | Global label | |
| | Structure folder | Structure | |
| | Program block | Program block ^{*2*3} | |
| | Function block | Function block ^{*2*3} | |
| | Function | Function ^{*2*3} | |
| | Global label | Global label ^{*3} | |
| | Structure | Structure ^{*3} | |

^{*1} Imported only when selecting the following menu:


[Project] ⇒ [Import File] ⇒ [IEC61131-10 XML Format]

^{*2} Only data in Structured Text is imported.

^{*3} Only data which has the same name as the selected data is imported.

Operating procedure

■Importing all data

1. Select [Project] ⇒ [Import File] ⇒ [IEC61131-10 XML Format].
Alternatively, select and right-click "Project" in the navigation window, then select [Import File] from the shortcut menu.
2. Select a file to import in the "Import File" screen.
3. Click the [Open] button.
4. Read the displayed message, and set "Processing when the data names on the project are overlapped." ( Page 140
When the data name is duplicated with the data name in a project)
5. Click the [Yes] button.

■ Importing only the selected data

1. Select and right-click any of the following data in the navigation window, then select the shortcut menu.

| Data | Shortcut menu |
|---------------------|--|
| Program folder | [Import File] ⇒ [IEC61131-10 XML Format] |
| FB/FUN folder | |
| Global label folder | |
| Structure folder | |
| Program block | |
| Function block | |
| Function | |
| Global label | |
| Structure | |

2. Select a file to import in the "Import File" screen.
3. Click the [Open] button.
4. Read the displayed message and set "Processing when the data names on the project are overlapped."*1 (☞ Page 140
When the data name is duplicated with the data name in a project)
5. Click the [Yes] button.

*1 When any of the following items is selected, "Replace" is automatically set for "Processing when the data names on the project are overlapped."

- Program block
- Function block
- Function
- Global label
- Structure



The import result is displayed in the "Output" window.

Considerations

- Only XML files compliant with IEC61131-10 can be imported.
- When the name of the data in an XML file is duplicated, only the first data is imported.
- When a program is being monitored or simulated, a file cannot be imported.

When the data name is duplicated with the data name in a project

The operation when importing data whose name is duplicated with that in a project can be changed according to the selected item for "Processing when the data names on the project are overlapped" in the message displayed at the import.

The following table shows the selected items and operations for the items.

| Selected item | Operation |
|---------------|---|
| Add | Data whose name is duplicated is imported by adding '_n' to the name. ('n' is a sequential number starting from 2.) (Example: ProgPou → ProgPou_2) |
| Replace | Data in a project is overwritten with the duplicated data. |
| Skip | Duplicated data is not imported. |
| Ask | The message to determine the operation appears at each import of duplicated data. |

File format

An XML file can be created by referring a sample file stored in the folder where GX Works3 is installed.

The following is an example of the storage location.

- 64-bit version operating system: C:\Program Files (x86)\MELSOFT\GPPW3\SampleData\IEC61131-10XML
- 32-bit version operating system: C:\Program Files\MELSOFT\GPPW3\SampleData\IEC61131-10XML

■Elements to be imported

For details on the elements to be imported among the elements in an XML file, refer to the following:

 Page 969 XML File Formats (IEC61131-10 Format)

Elements that are not defined in IEC61131-10 are imported based on the information on 'AddData.'

In addition, if data required for import is not included in the XML file, the default value is set.

Associating data with a help file

Data can be associated with a help file (such as PDF file and e-Manual).

The associable data is listed below.

- Project
- POUs (program block, function block, function)
- Global labels, structures

Associated help files can be opened from the navigation window, element selection window, and a program editor.

Setting for a help file

The path information of a help file can be set for data by the following procedure.

Operating procedure

1. Select a project or data in the navigation window, then select [Project] ⇒ [Data Operation] ⇒ [Properties] (🔧), or right-click it and select [Properties] (🔧) from the shortcut menu.
2. Specify a location of a help file using either an absolute path or a relative path in "Help Path Information," and click the [OK] button.

■Using different help files among multiple languages

To use different help files among multiple languages, suffix the file names with the following character strings. (Example: help_ja-JP.pdf, help_en-US.pdf)

| Language | Character string |
|---------------------|------------------|
| Japanese | _ja-JP |
| English | _en-US |
| Simplified Chinese | _zh-CN |
| Korean | _ko-KR |
| Traditional Chinese | _zh-TW |

For the "Help Path Information" in the property, specify the file name with no text described above. (Example: c:\library\help.pdf)

■Specifying a help file using the relative path

When a help file is specified using the relative path, GX Works3 will search for the file in the following order.

- Installation folder of GX Works3 → folder where the project file currently opened is included

■Associating data with an e-Manual

To associate data with a user-created e-Manual, the e-Manual must satisfy all the following conditions:

| Condition |
|--|
| The e-Manual is created with e-Manual Create ^{*1} . |
| The e-Manual is registered in e-Manual Viewer. |
| The character string same as the name of data to be associated with the e-Manual is written in the e-Manual. ^{*2*3} |

*1 Software to convert a Word file or CHM file into an e-Manual.

To obtain e-Manual Create, please contact your local Mitsubishi Electric sales office or representative.

*2 To associate the e-Manual with a project or user library, the character string same as its title must be written.

*3 To associate the e-Manual with a function or function block, the instruction style must be set for the function name or function block name in a Word file or CHM file.

Create an e-Manual, Word file, and CHM file by following e-Manual Create Help.

Opening a help file

A help file associated with data can be opened from each screen.

Operating procedure

■Navigation window

1. Select a project or data in the navigation window.
2. Press the **[F1]** key.

■Element selection window

1. Select an element in the element selection window.
2. Press the **[F1]** key.

■Program editor

1. Select a function or function block on a program editor.
2. Press the **[F1]** key.



Precautions

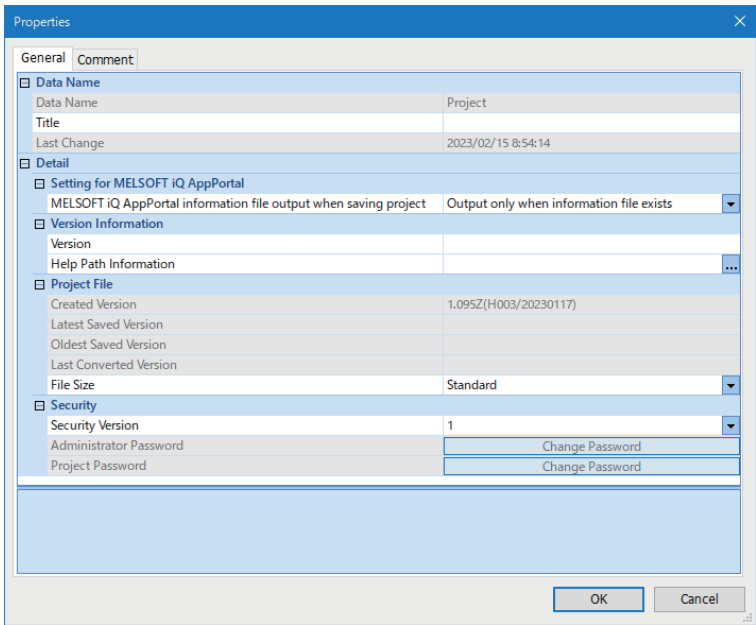
Before opening a help file, make sure to check that the file can be trusted.

Properties

Display the properties of data such as a folder, parameter, and program.
A title and comment can be added to each data.

Window

1. Select data in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Properties] ().
Alternatively, right-click it and select [Properties] () from the shortcut menu.

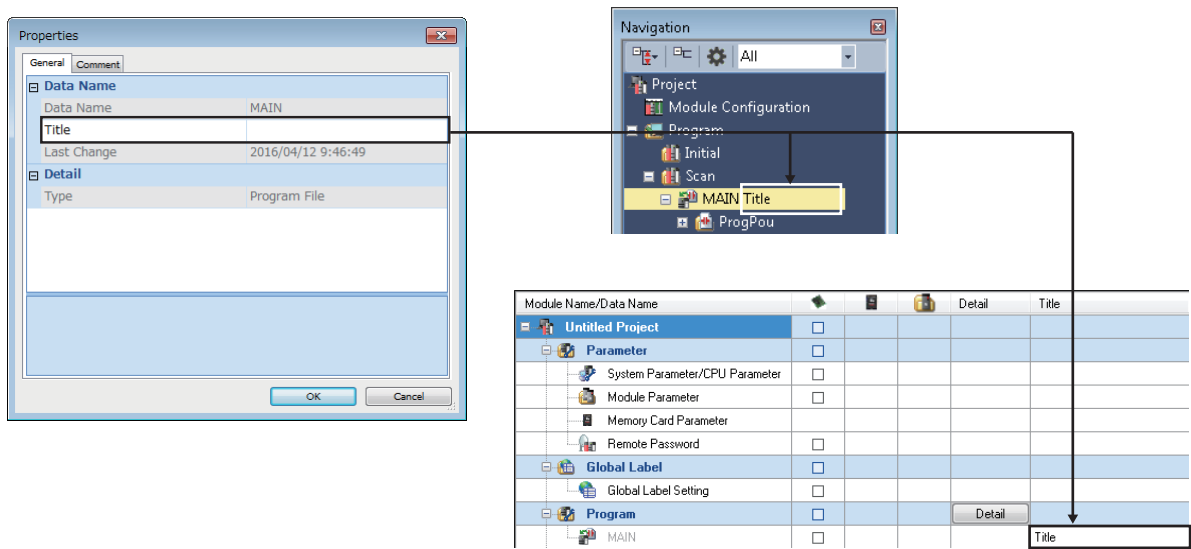


Operating procedure

Set each item and click the [OK] button.

Title

A title set to data is displayed with a data name in the navigation window.
The title is also displayed in the "Online Data Operation" screen when writing/reading data to/from the programmable controller.



Compressing a project file

When saving a project, whether or not to compress data can be set in the following procedure.

Operating procedure

1. Select a project in the navigation window, then select [Project] ⇒ [Data Operation] ⇒ [Properties] (🌐), or right-click it and select [Properties] (🌐) from the shortcut menu.
 2. Select "Compression" or "Standard" for "File Size" and click the [OK] button.
- A project is saved according to the setting.
- By selecting "Compression" for "File Size," the project file size decreases.

Precautions

- A compressed project cannot be opened in GX Works3 Version 1.047Z or earlier.
 - A compressed project may not be used in MELSOFT products other than GX Works3.
- In that case, change the setting to "Standard," or use another version of MELSOFT products which support that project.
- The following table shows the applicable version of each product and support date (as of October 2024).

| Product name | Version | Date |
|-------------------|---------|------|
| MELSOFT Navigator | 2.54G | — |
| MT Works2 | 1.150G | — |
| CW Configurator | 1.012N | — |

- When a security version of a project is set to "2" in GX Works3 Version 1.096A or later, "Standard" cannot be set for the project, and "Compression" is automatically set.

Settings for MELSOFT iQ AppPortal

An iQ AppPortal information file can be output by setting the following item.

It is output when saving a project or exporting a library.

For details on iQ AppPortal, refer to the following:

📖 iQ AppPortal Operating Manual


Operating procedure

1. Select a project in the navigation window, then select [Project] ⇒ [Data Operation] ⇒ [Properties] (🌐), or right-click it and select [Properties] (🌐) from the shortcut menu.
2. Select "Always output" for "MELSOFT iQ AppPortal information file output when saving project," and click the [OK] button.

3.4 Searching the Navigation Window

Data in the navigation window can be searched for, and the results can be displayed.

For the search method, refer to the following:

 Page 79 Quick Search

3.5 Changing the Module Type and Operation Mode of Projects

The module type and operation mode of a project can be changed to another while editing the project.

Revisions registered in the project revision history are retained after changing the module type and operation mode.

For a project whose security version is '2,' a project password and administrator password are retained after changing the module type and operation mode.

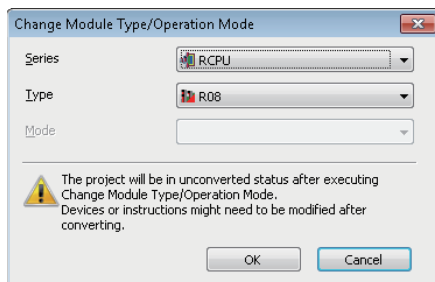
For RnPCPUs, the operation mode only can be changed.

For remote head modules, both module type and operation mode cannot be changed.

3

Window

Select [Project] ⇒ [Change Module Type/Operation Mode].



Operating procedure

1. Select a new module type and operation mode, and click the [OK] button.
2. Compare the projects before and after the change to check the changed contents.
3. Edit each data according to the new module type and operation mode.

Precautions

- Since data cannot be restored after changing the module type and operation mode, the project data needs to be saved in advance.
Note that, the project status after the change is changed to unsaved state.
- A module label of a CPU module, used before the module type change, is deleted, and a module label after the change is added. Therefore, the program may need to be modified after the change.

Combinations of CPU series that module types are changeable

○: Changeable, △: Changeable (restricted), ×: Not changeable

For the restricted contents, refer to the displayed message.

| CPU series before change | CPU series after change | | | | | | |
|--------------------------|-------------------------|--------|----------|----------|----------|--------|--------|
| | RnCPU | RnPCPU | RnSF CPU | RnEN CPU | RnPSFCPU | FX5CPU | LH CPU |
| RnCPU | ○ | ○ | ○ | △ | △ | × | × |
| RnPCPU | ○ | ○ | ○ | △ | △ | × | × |
| RnSF CPU | × | × | ○ | × | △ | × | × |
| RnEN CPU | △ | △ | △ | ○ | △ | × | × |
| RnPSFCPU | × | × | △ | × | ○ | × | × |
| FX5CPU | ○ ^{*1} | × | × | × | × | ○ | × |
| LH CPU | × | × | × | × | × | × | ○ |

*1 Only FX5UCPU and FX5UCCPU can be changed to R04CPU.

Point

To utilize data to a different module type of CPU module, open each editor and copy the data.

Considerations for combinations of CPU series

■ Changing the module type from an RnENCPU to a CPU module that occupy one slot

When the setting items in "I/O Assignment Setting" on the [I/O Assignment] tab of the "System Parameter" screen were set, the network part is not placed and the same network type module "RJ71EN71" is placed after changing the module type.

■ Changing the module type from a CPU module that occupies one slot to an RnENCPU

When the setting items in "I/O Assignment Setting" on the [I/O Assignment] tab of the "System Parameter" screen were set, any of the following modules is required to be placed on the right side of the CPU module (slot No.0.)

- RJ71EN71 (CCIEC)
- RJ71EN71 (CCIEF)
- RJ71EN71 (E+CCIEC)
- RJ71EN71 (E+CCIEF)

After changing the module types, these modules will be deleted from the setting contents of I/O Assignment Setting. Instead, the same network type CPU extension module '_RJ71EN71' will be placed on slot No.0.

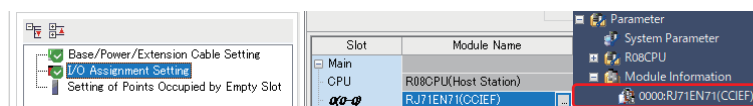
Ex.

The following shows the procedure for changing R08CPU to R08ENCPU.

Operating procedure

1. In "I/O Assignment Setting" on the [I/O Assignment] tab of the "System Parameter" screen, place RJ71EN71 on the right side of the CPU module (slot No.0).

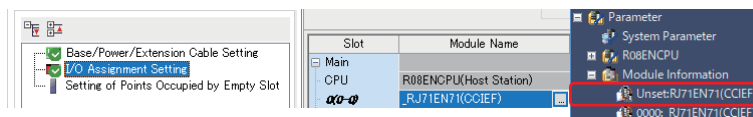
RJ71EN71 is displayed in the navigation window.



2. Change the module type. (Refer to Page 147 Changing the Module Type and Operation Mode of Projects)

RJ71EN71 that was placed on slot No.0 is deleted, then _RJ71EN71 is placed on the slot.

In addition, the start I/O number of RJ71EN71 displayed in the navigation window is changed to "Unset."



■Changing the module type from an RnPCPU and an RnPSFCPU to another CPU module

The following contents related to process control set for an RnPCPU and an RnPSFCPU are deleted.

- Tag FB setting
- "Use the process control extension" set in the "Properties" screen of a program file
- "Execution Interval"/"Phase" set in the "Properties" screen of a program block
- "Execution Interval"/"Phase" set in the "Program File Setting" screen
- For a function block, the setting which was set for "Use as Tag FB"/"Tag Type" in the "Properties" screen
- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting"
- System header and system footer
- Global label setting 'M+PTAG'

■Changing the module type from an FX5CPU to an RCPU

By changing the module type from an FX5CPU to an RCPU, a project revision history is deleted.

Project data needs to be saved in advance.

For details on other modifications that are required before and after module type change, refer to the following:

📖 Page 990 Considerations for Changing from FX5CPUs to RCPUs

Combinations of changeable operation modes

For the restricted contents, refer to the displayed message.

○: Changeable, △: Changeable (restricted)

| Operation mode before change | Operating mode after change | | |
|------------------------------|-----------------------------|---------|-----------|
| | No specification | Process | Redundant |
| No specification | ○ | ○ | △ |
| Process | △ | ○ | △ |
| Redundant | △ | ○ | ○ |

3.6 Verifying Projects

The project currently opened can be verified with data of another project.

By verifying projects, the consistency and changes can be checked.

Projects can be verified between different module types of a same series.

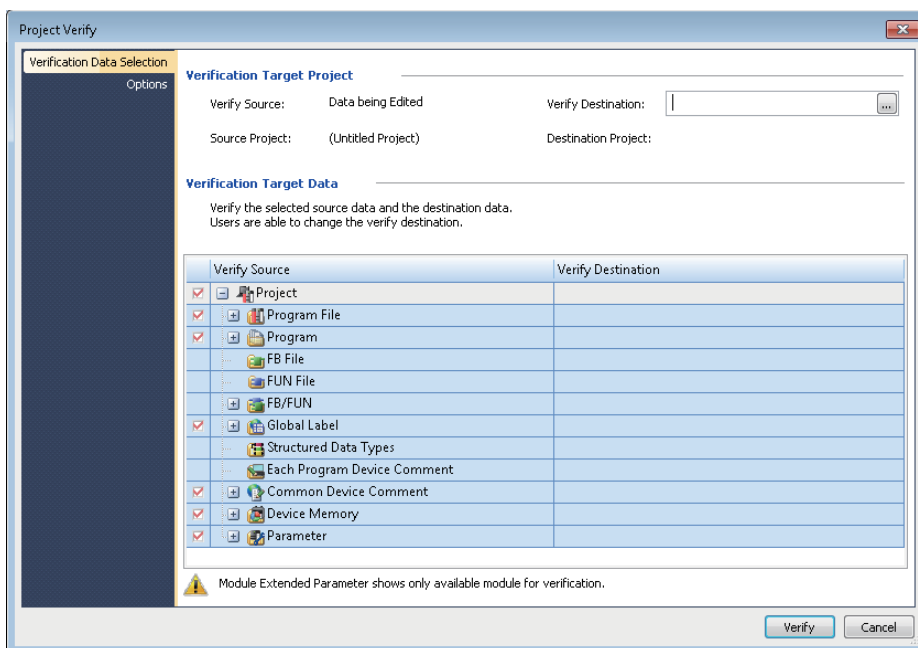
A project of a remote head module cannot be verified with that of a CPU module.

When user information is registered to a project, user authentication is required. (☞ Page 708 Logging on to a project)

Verification

Window

Select [Project] ⇒ [Project Verify].



Operating procedure

1. Specify a project for "Verify Destination" on the [Verification Data Selection] tab.
2. Select the data to be verified, and click the [Verify] button.

A verification result is displayed in the "Verify Result" window.

Point

The target project file can be specified by dragging and dropping.

By selecting "Yes" for the following option, the label memory can be verified. (☞ Page 156 Program file/FB file/FUN file)

- "Other Editor" ⇒ "Label Editor Common" ⇒ "Verify" ⇒ "Include Label memory as Verify Target"

Precautions

- A GX Works2 or GX Developer project cannot be verified.
- A project for which a security is set can be verified when both data of the verification source and verification destination are not read-protected.

Parameters

■Module parameters

In a project for FX5CPUs, parameters for the following modules can be verified.

| Module | | | | | |
|---------------|---------------|----------------|----------------|----------------|--------------|
| FX5-232ADP | FX5-485ADP | FX5-4AD-ADP | FX5-4AD-PT-ADP | FX5-4AD-TC-ADP | FX5-4DA-ADP |
| FX5-4A-ADP | FX5-16ET/ES-H | FX5-16ET/ESS-H | FX5-4LC | FX5-4LC(FX3) | FX5-8AD |
| FX5-8AD(FX2N) | FX5-40SSC-S | FX5-80SSC-S | FX5-40SSC-G(S) | FX5-80SSC-G(S) | FX5-20PG-P |
| FX5-20PG-D | FX5-ENET | FX5-ENET/IP | FX5-OPC | FX5-CCLIEF | FX5-CCL-MS |
| FX5-CCLGN-MS | FX5-ASL-M | FX5-4AD | FX5-4AD(FX3) | FX5-4DA | FX5-4DA(FX3) |
| FX5-SF-MU4T5 | — | — | — | — | — |

■Module extended parameters

Module extended parameters are not verified.

However, the module extended parameters of the following modules can be verified:

- Simple motion module
- CC-Link IE TSN compatible motion module (simple motion mode)
- MELSEC iQ-R positioning module
- MELSEC iQ-R serial communication module
- MELSEC-L LD75P/LD75D type positioning module
- MELSEC-L serial communication module

■AnyWireASLINK configuration setting



The AnyWireASLINK configuration setting that includes any of the following modules is not verified.

- CC-Link-AnyWireASLINK bridge module
- CC-Link IE Field-AnyWireASLINK bridge module
- CC-Link IE TSN-AnyWireASLINK bridge module

■Verifying only specific intelligent function modules

The procedure to verify only specific intelligent function modules is as follows:

Operating procedure

1. After projects are verified, select "Module Parameter" in the result list in the "Verify Result" window, then double-click it or press the  key.
2. Click the [Stop] button in the "Verification Progress" screen immediately after verification starts.
3. Select a module to verify in the [Module Parameter] tab in the "Verify Result" screen, and double-click it or press the  key.

■Unmatched module parameters

When verifying module parameters, the following message may appear.

- Message: Module parameters created through different versions are verified. For some items, mismatch results might be shown even if the same settings were set on the setting window.

To match the module parameters, perform the following operations to the projects of the verification destination and source, and then verify once again.

Operating procedure

1. Change the corresponding setting item in the parameter editor, and then restore it.
2. Save the project.

Checking a verification result

A verification result can be checked in the "Verify Result" window or the detailed display (diagram/table format) screen. In the detailed display (diagram/table format) screen, the details of a project verification result are displayed in a diagram or table format.

| No. | Name | Description | Reference |
|-----|---|--|---|
| (1) | Verification result | Result list A tab in which the verification results of each data are displayed. By double-clicking data including multiple units of data such as FBD/LD program, the verification result of those data is displayed in a new tab. | — |
| (2) | | Detailed display A tab in which the details of mismatched data are displayed. By double-clicking the data displayed in the result list, the verification result is displayed according to the data type. | Page 155 Detailed display (program file) Page 158 Detailed display (program) Page 160 Detailed display (other data) |
| (3) | Detailed display (diagram/table format) | A screen in which verification results of programs, labels, structures, and device comments are displayed in a diagram or table format. This screen appears by double-clicking any of the rows where the following character strings are displayed in the "Type" column of the result list. <ul style="list-style-type: none"> • Program: Program, Zoom • Label: Global Label, Program (Local Label), FB/FUN (Local Label) • Structure: Structured Data Types • Device comment: Each Program Device Comment, Common Device Comment | Page 162 Detailed display (diagram/table format) |


Ex.

FBD/LD program


(1)

(2)

(3)

Font and the font and background color in the "Verify Result" window can be changed. ( Page 82
Checking and Changing Colors and Fonts)

Only mismatched data can be displayed by using the following menu while the detailed display tab in the "Verify Result" window is displayed.

- [View] ⇒ [Show only Mismatches] ()

In addition, a verification result can be exported to a file by using the following menu.

- Select [Edit] ⇒ [Export to File] ().
-

Precautions

Data inconsistency may be detected in a global label, local label, or structure.

In that case, there is a possibility that the inconsistency will be solved by performing the following operations in the editor where the data is defined.

- 1.** Export data of the corresponding label or structure to a CSV file.
- 2.** Import the file exported in step 1.

Then, in a global label editor, check the setting contents in the "Assign (Device/Label)" column. (For a global label and structure only)

Detailed display (program file)

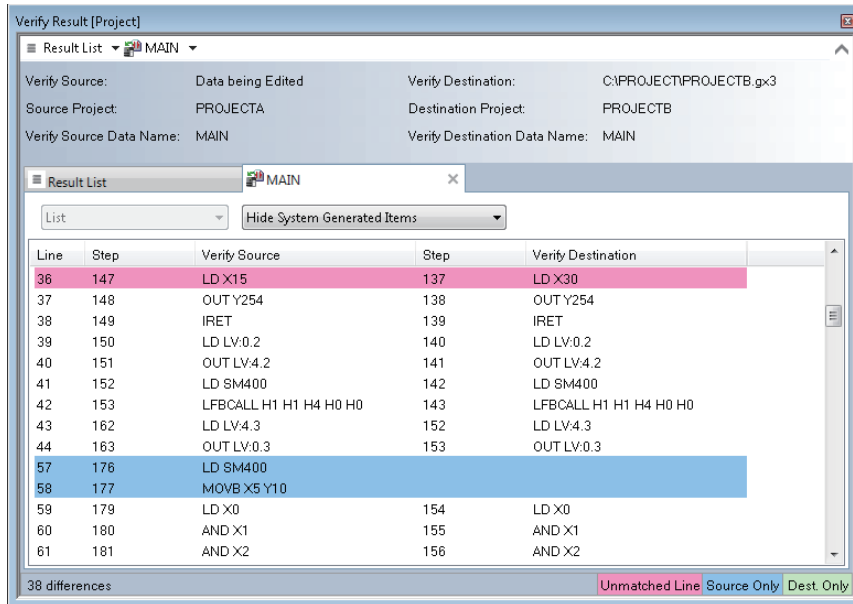
The details of the verification result of a program file, FB file, and FUN file can be checked in the detailed display tab.

Window

Select and double-click data in the result list in the "Verify Result" window.

Ex.

Program file



■ Searching for mismatched data

By selecting [Find/Replace] ⇒ [Next Mismatch] (🔍) / [Previous Mismatch] (🔍), mismatched data can be searched for.

■ Jumping to an editor

By double-clicking the displayed data, the cursor jumps to the corresponding data in each editor.



After modifying mismatched data, double-click the data in the result list. By doing so, a verification result using the latest data of the verification source can be checked.

Precautions

■Program file/FB file/FUN file

- When "Hide System Generated Items" is selected from the pull-down list of a Verify Result screen (detailed display), the following instruction codes are omitted in display.
_TMALLOC, _TMFREE, JMPO, NOP H0, EXEFBDUMMY, FBRET, NOP, LD TMP, OUT TMP
- The label memory assigned to a label may be displayed in a verification result. For the types of displayed label memory, refer to the following:
☞ Page 938 Label Memory Types
- When either verification destination or source satisfies all of the following conditions, its memory reserved area is changed. Therefore, difference is generated in the internal data between these projects; a mismatch may be detected between their program files, FB files, or FUN files.

| No. | Condition |
|-----|---|
| (1) | All programs have been converted (reassigned) after a value of any of the following items was changed in the "Properties" screen of a function block. <ul style="list-style-type: none">Label Reserved AreaLatch Label Reserved AreaSignal Flow Reserved Area |
| (2) | The FB instance of a function block whose reserved area capacity has been changed is used in a program or a subroutine type function block. |

- When either verification destination or source satisfies all of the following conditions, its memory reserved area is changed. Therefore, difference is generated in the internal data between these projects; a mismatch may be detected between their program files or FB files.

| No. | Condition |
|-----|---|
| (1) | All programs have been converted (reassigned) after the value of "Reserved area" in the "Properties" screen of a structure definition was changed. |
| (2) | A global label or a local label specified a structure definition, whose reserved area capacity has been changed, as the data type is used in the program. |

■When the versions of GX Works3 that converted program files/FB files/FUN files are different

For verification of program files/FB Files/FUN files, when the versions of GX Works3 that converted the program files of a verification source and verification destination are different, there may be a difference in the conversion result, and the verification result also may be mismatched. In this case, convert all programs in both verification source and verification destination with the same version of GX Works3, then verify them again.

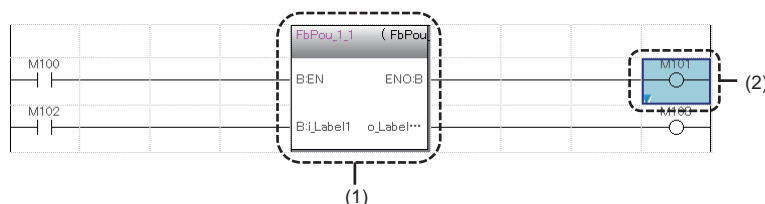
■When a function block with EN/ENO is used in a ladder program

When a project that satisfies all of the following conditions, the verification results of program files, FB files, or FUN files in a ladder or SFC program may be mismatched. In this case, convert (reassigned) all programs in both verification source and verification destination with the same version of GX Works3, and verify them again.

- A function block, where "Yes" is selected for "Use EN/ENO" on the "Properties" screen, is used in a ladder program or Zoom created in Ladder Diagram language.
- After reading a project that contains a program described above from a CPU module, all of the programs are converted (retained).

■When the cursor jumps to an output argument of a macro type function block

If the cursor jumps to the output argument (2) connected to the macro type function block (1) when double-clicking data, the corresponding data may actually exist in a program of the macro type function block (1).



■When a security is set for a program file

When a program file, FB file, or FUN file that contains a program file, for which a security is set, is specified as a verification destination, the detailed verification result screen of each file does not appear.

The detailed verification result screen of each file appears by changing the setting of the locked program file to accessible. (☞ Page 698 Procedure for making locked program files accessible)

■Considerations for program file verification

- When program files are mismatched but programs in the program files are matched, it may be caused by a difference of the execution order of the programs in the program files. Check the program file setting.
- In a program including a subroutine type function block, the arguments of FBCALL instructions (LFBCALL, LSAFBCALL) may be mismatched.

The FBCALL instructions are automatically created to call a subroutine type function block by a system.

The arguments of the FBCALL instructions indicate an FB file of a function block to be called, POU, and addresses of memory reserved area (label area, latch label area, signal flow area).

Therefore, even if a project configurations are the same, the arguments of the FBCALL instructions may differ depending on the order to create programs. However, operations of a verification source and verification destination have no difference.

■When a block password is set for a program

- When a program file, FB file, or FUN file that contains a program, for which a block password is set, is specified as a verification destination, the program with a block password cannot be displayed in the verification result.

If a block password is set only for a program of the verification source, the program with a block password can be displayed in the verification result by unlocking the password. (☞ Page 696 Authenticating a block password)

- When a program file, FB file, or FUN file that contains a program, for which a block password is set, is specified as a verification destination, the detailed verification result screen of each file does not appear.

If a block password is set only for a program of the verification source, the screen appears by unlocking the password. (☞ Page 696 Authenticating a block password)

■When a function is used

Even if the project configurations of a verification source and verification destination are the same, the program files/FUN files may be mismatched due to the difference of the order in which a function was added.

■When verifying projects of which the system locales are different

When the system locale (or display language) for a project differs between the verification source and verification destination, the verification result of program files/FB files/FUN files may be mismatched.

The system locales for projects of the verification destination and verification source need to be matched to verify their data.

Detailed display (program)

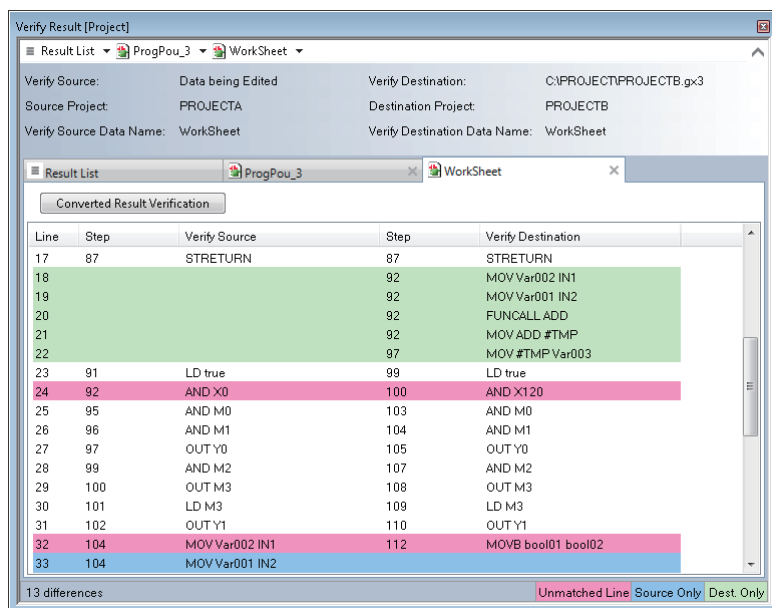
The details of a program verification result can be checked in the detailed display tab.
In the detailed display tab, the details of a verification result is displayed in a list.

Window

1. Select and double-click data in the result list in the "Verify Result" window.
2. Click the [Converted Result Verification] button in the detailed display tab.

Ex.

FBD/LD program



■Searching for mismatched data

By selecting [Find/Replace] ⇄ [Next Mismatch] (🔍)/[Previous Mismatch] (🔍), mismatched data can be searched for.

■Jumping to an editor

By double-clicking the displayed data, the cursor jumps to the corresponding data in each editor.



After modifying mismatched data, double-click the data in the result list. By doing so, the latest verification result can be checked.

Precautions

■ Ladder program

- When there is no program in a macro type function block, the cursor jumps to the top of the ladder block.
- When programs containing an inline structured text program are verified, "STB" is displayed on the row of the inline structured text program.

The cursor jumps to the corresponding row of the inline structured text program by double-clicking the "STB."

- When programs containing a functions and/or function blocks are verified, the result is displayed as follows:

Function: row from ";FUN BLK START" to ";FUN BLK END"

Function block: row from ";FB BLK START" to ";FB BLK END"

■ FBD/LD program

- When the versions of GX Works3 used for editing programs of a verification destination and source are different, the verification result may be mismatched due to the difference of position information of elements. In this case, edit, convert, and save the programs in both the verification source and the verification destination with a same version of GX Works3, and perform the verification again^{*1}.

- When programs containing a functions and/or function blocks are verified, the result is displayed as follows:

Function: row from ";FUN BLK START" to ";FUN BLK END"

Function block: row from ";FB BLK START" to ";FB BLK END"

It can be hidden by setting the following option.

[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Verify" ⇒ "Verify Setting" ⇒ "Minimize the Detailed Display (List Format)"

- In any of the following cases, "-" is displayed in the "Step" column.
 - A project and the data in a CPU module were verified by using the [Verify with PLC] menu.
 - A verification was performed without converting any or all programs which were read from a CPU module.
- When programs containing an inline structured text program are verified, "STB" is displayed on the row of the inline structured text program.

The cursor jumps to the corresponding row of the inline structured text program by double-clicking the "STB."

^{*1} When verifying with a programmable controller, perform the "Write to PLC" or "Online Program Change" in advance.

■ ST program

- When programs containing a functions and/or function blocks are verified, the result is displayed as follows:

Function: row from ";FUN BLK START" to ";FUN BLK END"

Function block: row from ";FB BLK START" to ";FB BLK END"

It can be hidden by setting the following option.

[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "ST Editor" ⇒ "Verify" ⇒ "Verify Setting" ⇒ "Minimize the Detailed Display (List Format)"

■ SFC program

- Even if displayed SFC diagrams of the verification destination look totally same as those of the verification source, the verification result may be mismatched due to a difference of the internal data which is generated depending on the creation procedure.
- "-" is displayed in the "Step" columns of the verification destination and source.

Detailed display (other data)

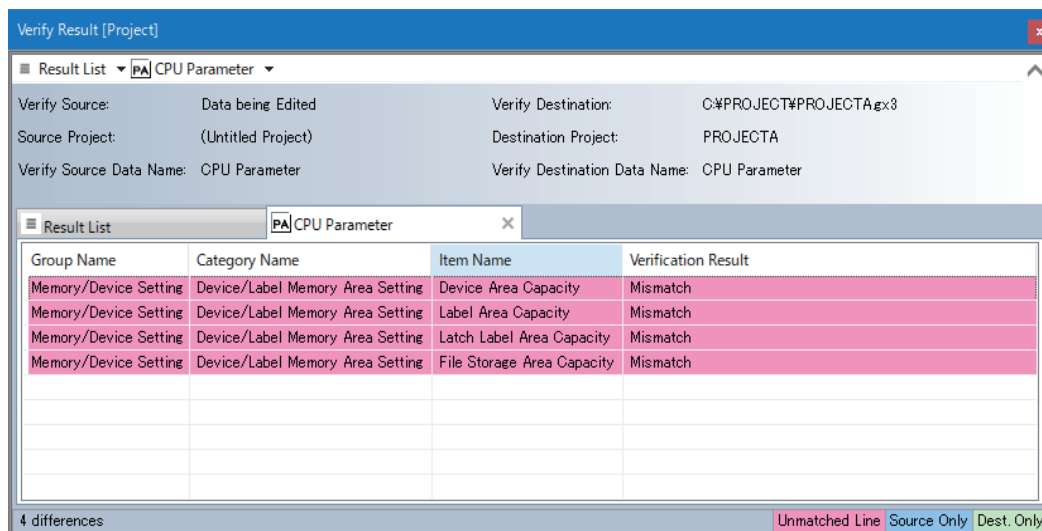
The details of the verification result of data other than a program file and program can be checked in the detailed display tab.

Window

Select and double-click data in the result list in the "Verify Result" window.

Ex.

CPU parameters (R04CPU)



■Searching for mismatched data

By selecting [Find/Replace] ⇨ [Next Mismatch] (🔍)/[Previous Mismatch] (🔍), mismatched data can be searched for.

■Jumping to an editor

By double-clicking the displayed data, the cursor jumps to the corresponding data in each editor.



After modifying mismatched data, double-click the data in the result list. By doing so, a verification result using the latest data of the verification source can be checked.

Precautions

■Device memory

- Device memory data can be verified even if their names are different.
- For a verification result of device memories, only mismatched devices are displayed.

■Parameters

- When the same profiles are not registered to the verification destination and source, the verification result may be mismatched.

■When the number of mismatched parameters exceeds 1000

Up to 1000th mismatched parameters are displayed in the detailed verification result screen, and verification for 1001st or later is interrupted.

To verify parameters after interruption, correct the mismatched data before verifying again.

Restriction

The following restrictions apply when a parameter item was added to the verification destination with upgrade of an intelligent function module.

- The added parameter item is excluded from a verification because the verification source that has not been upgraded cannot identify the item. Therefore, other parameters will be verified, and when those parameters matched, it is applied to the verification result in each module.

Detailed display (diagram/table format)

Details on a verification result of the following data can be checked in the detailed display (diagram/table format) screen.

- Program (ladder program, ST program, FBD/LD program, SFC program)
- Label (global label, local label)
- Structure
- Device comment

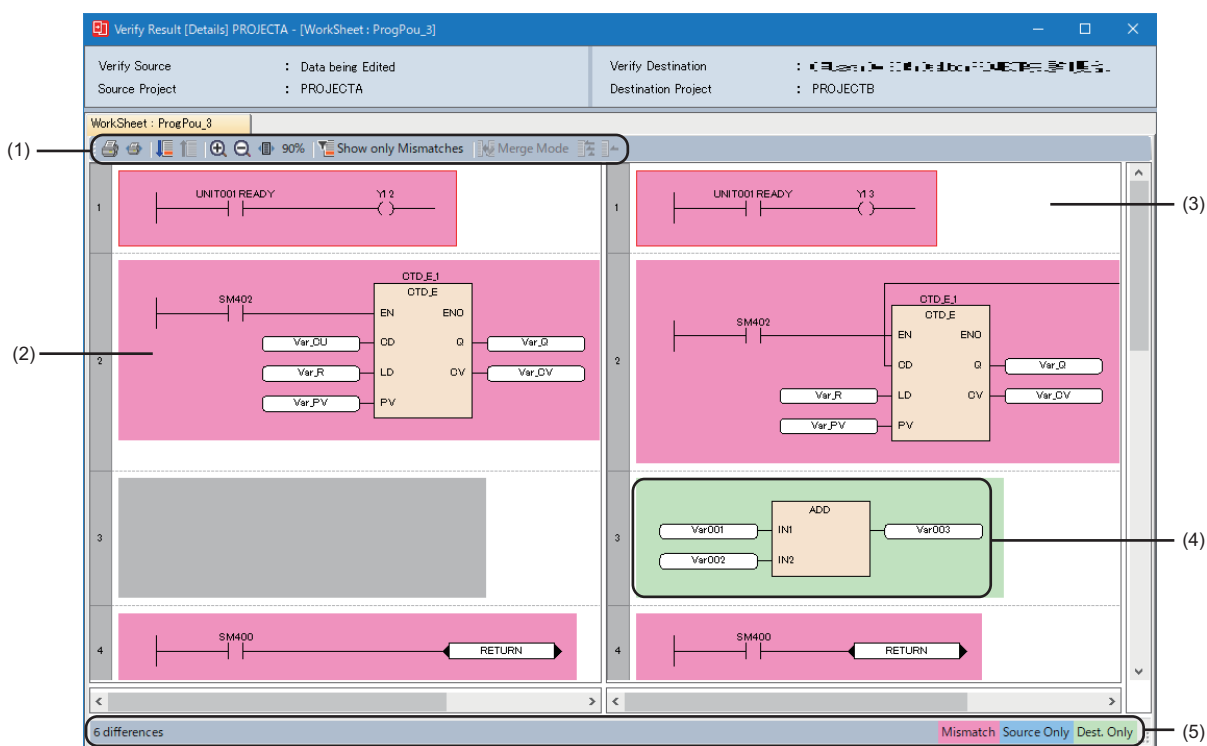
In the detailed display (diagram/table format) screen, the details on a verification result are displayed in a diagram or table format.

In this section, elements connected using connection lines are referred to as 'verification block.'

Window


Select and double-click data in the result list in the "Verify Result" window.

Ex.
FBD/LD program





- (1): Toolbar
- (2): Verification result display area (verification source)
- (3): Verification result display area (verification destination)
- (4): Verification block
- (5): Status bar

Point

When displaying a verification result of any of the following data, the display of either verification source or destination whose magnification is higher is zoomed in or out according to the width of the one with lower magnification by clicking  (Zoom to Page Width).

- Ladder program
- FBD/LD program
- SFC program
- Label
- Structure
- Device comment

When displaying a verification result of ST programs, data in the selected range can be copied by pressing the  +  keys.

■Label, structure, and device comment

For a verification result of global labels, local labels, structures, or device comments, only mismatched data is displayed. Moreover, a verification result can be filtered.

An operation method for filtering is the same as that in the cross reference window. For details, refer to the following:

 Page 477 Filtering display

■Searching for mismatched data

By clicking  (Next Mismatch) or  (Previous Mismatch) on the toolbar, mismatched data can be searched for.

- Ladder program: Mismatched data is displayed for each cell.
- FBD/LD program and SFC program: Mismatched data is displayed for each verification block.
- ST program: Mismatched data is displayed for each row.

■Displaying mismatched data only

Only the mismatched data can be displayed by clicking  (Show only Mismatches) on the toolbar.

■ Merging mismatched data into a verification source

When the verification result of a ladder program or ST program is displayed, mismatched data can be merged into a program of the verification source. (Excluding a Zoom and an inline structured text program used in an FBD/LD program)

The following table shows the procedures for merging data.

| Data to be merged | Operating procedure | | |
|---------------------|---|--------------|--|
| | Procedure | Shortcut key | Icon on the toolbar |
| Any mismatched data | ❶ Switch to the merge mode. | keys | (Merge Mode) |
| | ❷ Move to the data to be merged. | keys keys | (Next Mismatch) (Previous Mismatch) |
| | ❸ Merge data in the selected range into a program of the verification source. | keys | (Merge the Selected Range) |
| All mismatched data | ❶ Switch to the merge mode. | keys | (Merge Mode) |
| | ❷ Apply all data to a program of the verification source. | keys | (Reflect All) |

Precautions

- Once data is merged, it cannot be undone or redone.
- Data cannot be merged in the following cases:
 - A read-only project is verified.
 - A ladder program in the read mode or monitor read mode is verified.
 - Histories are verified with each other by using the project revision history function or project version management function.
 - Specific data in a master project is verified with that in a local project by using the project version management function.
 - All programs are matched.
- Only a program body is merged. The following data cannot be merged:
 - Global label
 - Local label
 - Structure definition
 - Function block
 - Function
 - Device comment

■Jumping to an editor

By double-clicking displayed data, the cursor jumps to the following data in each editor.

| Editor | Data |
|--|--|
| Ladder editor Structure definition Device comment editor | Double-clicked data |
| FBD/LD editor SFC editor | Data which is found first by searching a verification block from the upper left to lower right |
| ST editor | Data in the same row number as the one where the selected data is |
| Label editor | Double-clicked data ^{*1} |

^{*1} For a label or structure member assigned to a label, the cursor jumps to the data in the "Assign (Device/Label)" column.


■Printing

The following shows the procedure for printing a verification result.


Operating procedure

1. Click  (Print) on the toolbar.

In the "Print Preview" screen, an image is displayed in the case of using a printer which is set in [Use Always] of Windows.

2. Click  (Print) in the "Print Preview" screen.

Point

When printing a verification result of any of the following data, the screen zoomed out according to the widest verification block in the verification source and destination will be displayed in the print preview by clicking  (Print to Page Width) on the toolbar.

- Ladder program
- FBD/LD program
- SFC program
- Label
- Structure
- Device comment

■Exporting to a file

The following shows the procedure for exporting a verification result to a file.

Operating procedure

1. Right-click in the verification result display area, and select [Export to File] from the shortcut menu.

2. Set each item and click the [Save] button.

Precautions


■Differences from a program editor

Displayed data differs between the detailed display (diagram/table format) screen and program editor.

Data not to be verified is not displayed in the detailed display (diagram/table format) screen.

In addition, characters displayed in a program editor may not be displayed in the detailed display (diagram/table format) screen. In that case, check it by moving the cursor to the editor.


■Ladder program

- Even when instructions which are not displayed in a ladder program such as NOP are mismatched, the result cannot be checked in the detailed display (diagram/table format) screen. Check it in the detailed display tab, instead. ( Page 158 Detailed display (program))
- Programs are verified in the state where all collapsed ladder blocks, notes, and statements displayed.
- When jumping to data in a ladder program, notes and statements are displayed on an ladder editor regardless of the display format of the editor.



■FBD/LD program and SFC program

- Verification blocks are arranged vertically in window. This order differs from the actual execution order of programs.
- When the heights of function elements and function block elements are not matched, they are displayed as mismatches.

■FBD/LD program

- When function elements/function block elements are displayed as mismatches even though their display contents are matched between the verification source and the verification destination, the hidden arguments may not be matched. ( Page 342 Hiding arguments)
- An inline structured text program is not displayed in the preview display area of inline structured text elements in the detailed display (diagram/table format) screen.

■SFC program

The search cannot be performed for each element even by clicking  (Next Mismatch)/  (Previous Mismatch) on the toolbar but for each verification block.

■Data not to be verified

The following table shows the data not to be verified.

| Program | Data |
|-------------------------------|---|
| Ladder program | Comment and device displayed by using the following menu • [View] ⇒ [Comment Display]/[Display Device] |
| | Background color of cells |
| | Step number |
| FBD/LD program SFC program | Device displayed by using the following menu • [View] ⇒ [Device Display] |
| | Program display format changed by using the following menu • [View] ⇒ [Display Step/Transition]/[Switch Ladder Display] |
| | Link setting, background color, and text layout of POUs |
| | Automatic connector |
| FBD/LD program | Comment displayed by using the following menu • [View] ⇒ [Comment Display] ⇒ [Device/Label Comment] • [View] ⇒ [Comment Display] ⇒ [Switch FB/FUN Argument] |
| SFC program | Comment displayed by using the following menu • [View] ⇒ [Comment Display] |
| | Jump element |

■Color and font

Font and the font and background color in the detailed display (diagram/table format) screen cannot be changed.

■Verify result window

While the "Print Preview" screen is displayed, a verification result is not displayed properly in the Result List tab and the detailed display tab in the "Verify Result" window.

After closing the "Print Preview" screen, redisplay the tab.

■Label comment for an array element or bit-specified label

If the data type of a label is changed after the verification result is displayed, the cursor may not be able to jump to the label comment for an array element or bit-specified label from the verification result.

3.7 Project Revision History

This function manages the revision history of a project by recording changes in the project.

By using this function, a past project can be restored based on a revision.

Registering a revision

To record changes in a project, registering a revision in the "Register Revision" screen is required.

Window

Select [Project] ⇒ [Project Revision] ⇒ [Register Revision].

| | |
|---------|---------|
| PC Type | R08 |
| User | |
| Version | 1.010L |
| Title | Title A |

Comment(C)

OK Cancel

Operating procedure

Set each item and click the [OK] button.

Precautions

For a project whose security version is '2,' it may take time to register a revision.

Registering a revision when a project is overwritten

By setting options, a project revision can be registered when the project is overwritten.

This prevents that the project is overwritten without registering the revision.

The procedure to register a revision is shown below.

Operating procedure

1. Set "Yes" for the following option. (When the option has been set, this operation is not required.)
 - [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Register to the Revision When Saving Project"A confirmation message showing whether to register a revision appears when overwriting a project.
2. Read the displayed message, and click the [Yes] button.
3. Set each item in the "Register Revision" screen, and click the [OK] button.

3

Point

By selecting "Yes" for the following option, a revision title is set automatically. Therefore, the "Register Revision" screen explained in step 3 does not appear.

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Automatically Set Revision Titles"

In addition, by selecting "No" for the following option, the message explained in step 2 does not appear.

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Display Confirmation Message Showing Whether to Register Revision"

By selecting "Yes" for the following option, revision information is optimized when the revision is registered so that the file size of the project in which a label is used is reduced.

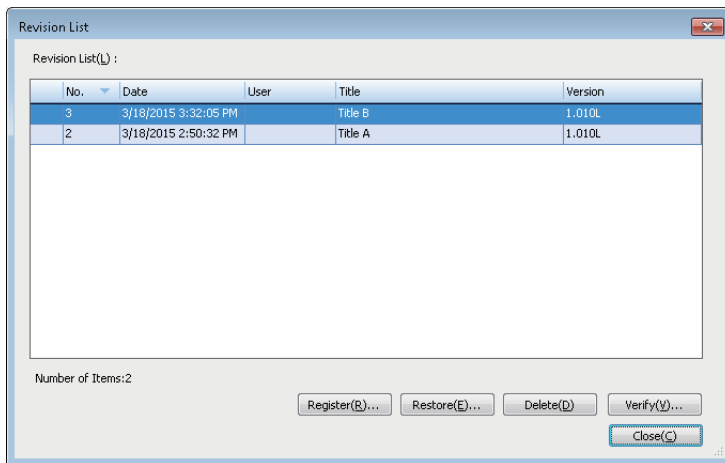
- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Optimize Revision Information to Reduce File Size"

Revision list screen

Registered revisions can be checked in the "Revision List" screen.
Revisions can be registered, restored, deleted, and verified in this screen.

Window

Select [Project] ⇒ [Project Revision] ⇒ [Revision List].



Select and right-click a revision, then select [Details] from the shortcut menu; the "Detailed Revision Information" screen appears, and the information such as comments entered at the registration can be checked.

Registering a revision

A project revision can be registered by clicking the [Register] button.
This time, information for iQ AppPortal is not registered.

Precautions

- It may take time to register a revision of a large project if the size of its project file exceeds 10 MB.
- For a project whose security version is '2,' it may take time to register a revision.

Restoring a revision

A past project can be restored based on a registered revision.

Operating procedure

1. Select a project revision to be restored, and click the [Restore] button.
 2. Click the [OK] button in the "Restore Revision" screen.
- ✓ will be displayed at the head of the revision selected in step 1 after the project restoration is completed.

Precautions

- Before restoring a project, register a revision of the project being edited. Otherwise, the project before the restoration is overwritten when the project restored based on another revision is saved.
- The added/changed/deleted user information is not restored.
- For a project whose security version is '2,' it may take time to restore a revision.

Deleting a revision

A registered revision can be deleted.

Operating procedure

Select a revision to be deleted, and click the [Delete] button.

Verifying a revision

A revision can be verified with another revision or a project being edited.

Operating procedure

Select a revision to be verified, and click the [Verify] button.

If only one revision is selected for verification, it is verified with a project being edited. To verify revisions, select two revisions. The operation method for displaying the verification result is the same as that of project verification. For more details, refer to the following:

 Page 153 Checking a verification result

Precautions

For a project whose security version is '2,' it may take time to verify a revision.

3.8 Project Version Management

This function manages the update revision history of a project for each data by recording changes in the project with a version management system^{*1}. (Changes not only in an entire project but also in each data can be recorded.)

^{*1} Manages the update revision history of a file that is created and edited on a personal computer.

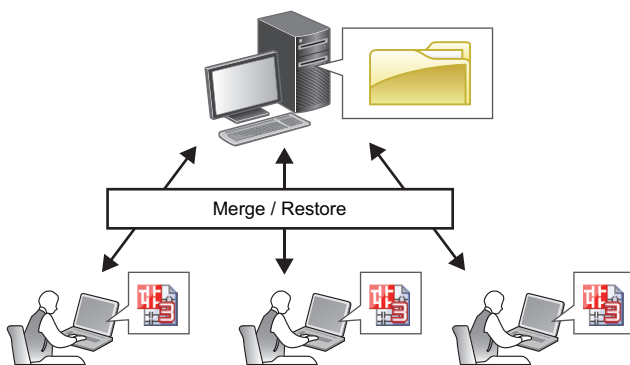
Overview

A created project can be registered in a version management system and the project can be edited by acquiring it from the system.

When an edited project is registered in the system again, the project that has been registered in the system is updated, and the changes are recorded as an update revision.

Consequently, the edited project is automatically merged into the project that has been registered in the system, and the update revision can be managed.

Moreover, past data can be restored based on an update revision.





■Features

The following shows features of this function.

- The update revision history of a project on a server can be managed for each data. (Changes in each data can be recorded individually.)
- Data created by multiple developers are automatically merged into one project. (Only specific data can be merged.)
- Only specific data can be restored based on a revision of data. (Only data with an error can be restored.)

■Update revision history

Changes in data are recorded as an update revision by either of the following operations.

- Register a project in a version management system. ( Page 176 Registering a project)
- Register local project data in a version management system. ( Page 181 Registering a project file and data)

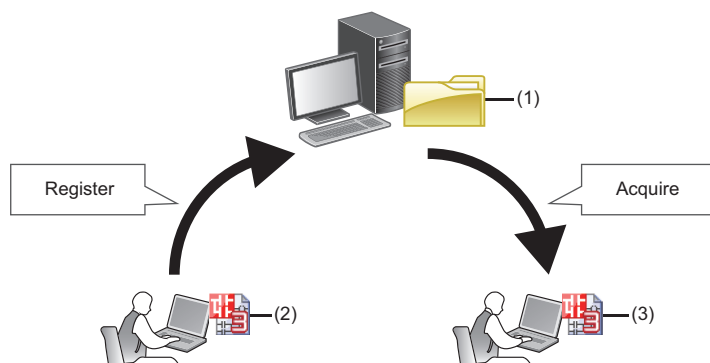
Master project and local project

By registering a project in a version management system, a project (folder format) in which changes are recorded is created. This project is referred to as a 'master project' in this manual.

The following projects can be merged into a master project.

- Original project of one registered in a version management system (single file format)
- Project acquired from the version management system (single file format)

These projects are referred to as 'local projects' in this manual.



(1): Master project

(2): Local project (original project of one registered in a version management system)

(3): Local project (project acquired from the version management system)

For each operation method, refer to the following:

☞ Page 176 Registering/acquiring/editing/deleting a project

Differences from iQ AppPortal

Both iQ AppPortal and GX Works3 have a function to manage changes in a project file.

The following explains differences (features and usage examples) of each function.

■Function of iQ AppPortal

| Feature | Usage example | Reference |
|---|--|-------------------------------|
| Single or multiple project files used in a system can be managed. (Managed in a server.) | Understanding the parent-child relationships between a newly created project file and its source and the timing of derivation when creating a new project file by utilizing one registered in iQ AppPortal | iQ AppPortal Operating Manual |

■Project version management function of GX Works3

| Feature | Usage example | Reference |
|---|---|-------------------------------------|
| Changes in data (such as a program, label, or parameter) in one project file can be managed. (Managed in a version management system.) | Managing changes per program when creating programs to be used in one project file with multiple developers | Page 172 Project Version Management |

■Project revision history function of GX Works3

| Feature | Usage example | Reference |
|---|---|-----------------------------------|
| Changes in a project file can be managed. (Managed in a project file.) | Backing up a project file by recording changes automatically when overwriting a project | Page 168 Project Revision History |

Operation flow

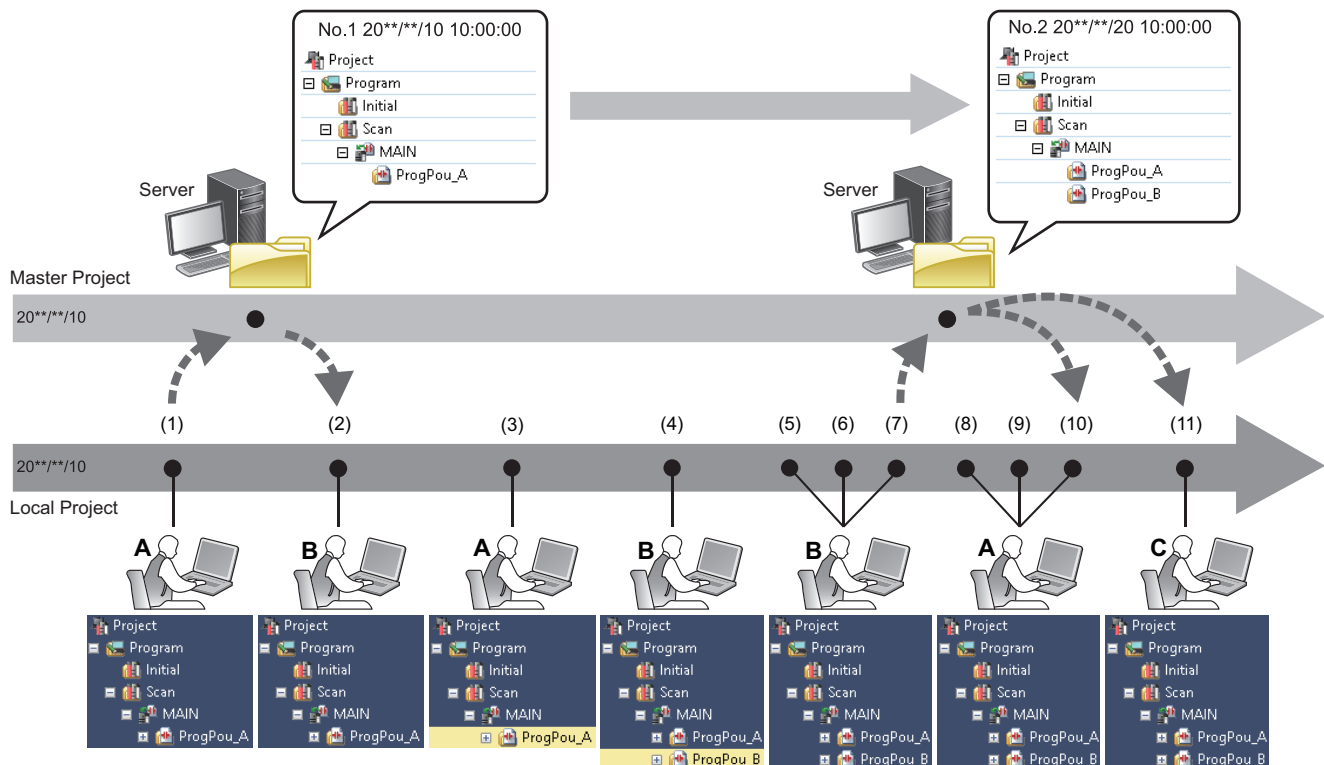
The following figure shows an operation flow to manage the update revision history of a project.

Ex.

Multiple developers (A, B, and C) assign tasks to one another and create one project:

Tasks assigned to each developer are as follows:

- A: Creating a new project and an own assigned program (ProgPou_A)
- B: Creating an assigned program (ProgPou_B) based on the project created by A
- C: Debugging programs in a master project



| No. | Developer | Purpose | Operation | Reference |
|------|-----------|---|--|--|
| (1) | A | To create a master project | Register a project in a version management system. | Page 176 Registering a project |
| (2) | B | To create a local project | Acquire a project from the version management system. | Page 177 Acquiring a project |
| (3) | A | To edit 'ProgPou_A' | Edit their respective local projects. | Page 177 Editing a project |
| (4) | B | To create 'ProgPou_B' | | |
| (5) | B | To merge 'ProgPou_B' into the master project | To check if the master project has been updated | Page 178 Update Revision screen |
| (6) | B | | To check differences between the local project and the master project | Page 186 Verifying a project file or data |
| (7) | B | | To merge 'ProgPou_B' | Page 181 Registering a project file and data |
| (8) | A | To merge 'ProgPou_B' into the own local project | To check if the master project has been updated | Page 178 Update Revision screen |
| (9) | A | | To check changes in updated 'ProgPou_B' | Page 188 Checking detailed information |
| (10) | A | | To merge 'ProgPou_B' | Page 184 Acquiring a project file and data |
| (11) | C | To debug the programs in the master project | Acquire a project from the version management system. (Debug the programs in the acquired project.) | Page 177 Acquiring a project |

Registering/acquiring/editing/deleting a project

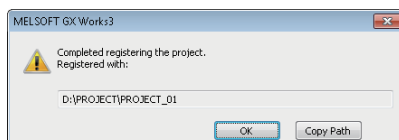
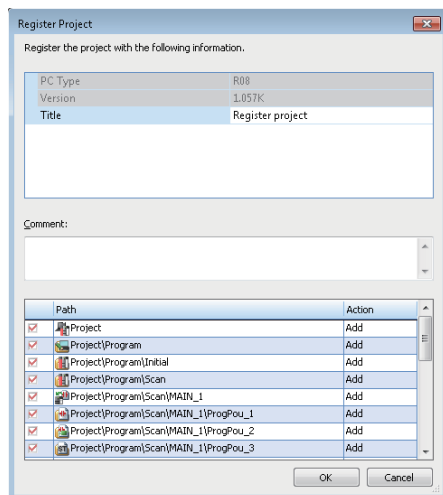
The following explains the methods for registering, acquiring, editing, and deleting a project.

Registering a project

The procedure to register a project in a version management system is as follows.

Only projects saved as a single file format can be registered in a version management system.

Operating procedure



1. Select [Tool] ⇒ [Configuration Management] ⇒ [Register Project].

If a project is not opened, select the project to be registered in the displayed screen.

2. Specify the path to a folder to manage a master project in the "Register Project" screen, and click the [OK] button. (Up to 256 characters)
3. Enter a title and comment in the "Register Project" screen, and click the [OK] button. (Title: up to 128 characters, Comment: up to 5120 characters)

A folder (master project) with the same name as the project name is created in the specified folder.

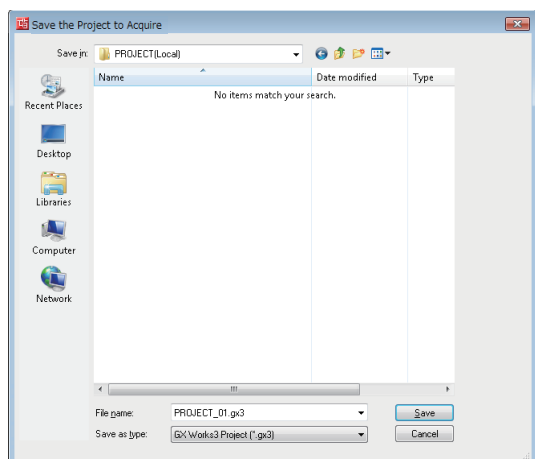
Precautions

- A project cannot be registered in the following cases:
 - The project is saved as a workspace format.
 - The project file name has more than 80 characters.
 - The project is logged on to as a user whose access level is 'Users.'
- For a project whose security version is '2,' it may take time to register a project.

Acquiring a project

The procedure to acquire a project from a version management system is as follows.

Operating procedure



1. Select [Tool] ⇒ [Configuration Management] ⇒ [Acquire Project].
2. Specify the path to the folder where a master project is managed in the "Acquire Project" screen. (Up to 256 characters)
3. Set each item in the "Save the Project to Acquire" screen and click the [Save] button.

3

Precautions

- An acquired project is in the unconverted state.
- For a project whose security version is '2,' it may take time to acquire a project.

Editing a project

A local project can be edited in the same manner as a normal project.

Precautions

Once either of the following is changed, the project data cannot be registered in or acquired from a version management system:

- A module type or operation mode set in a project
- A security version set in a project

Deleting a master project

To delete a master project, delete the folder created when the project was registered in a version management system (the one with the same name as the project name).


Update Revision screen

The update revision history of a project can be checked in the "Update Revision" screen.

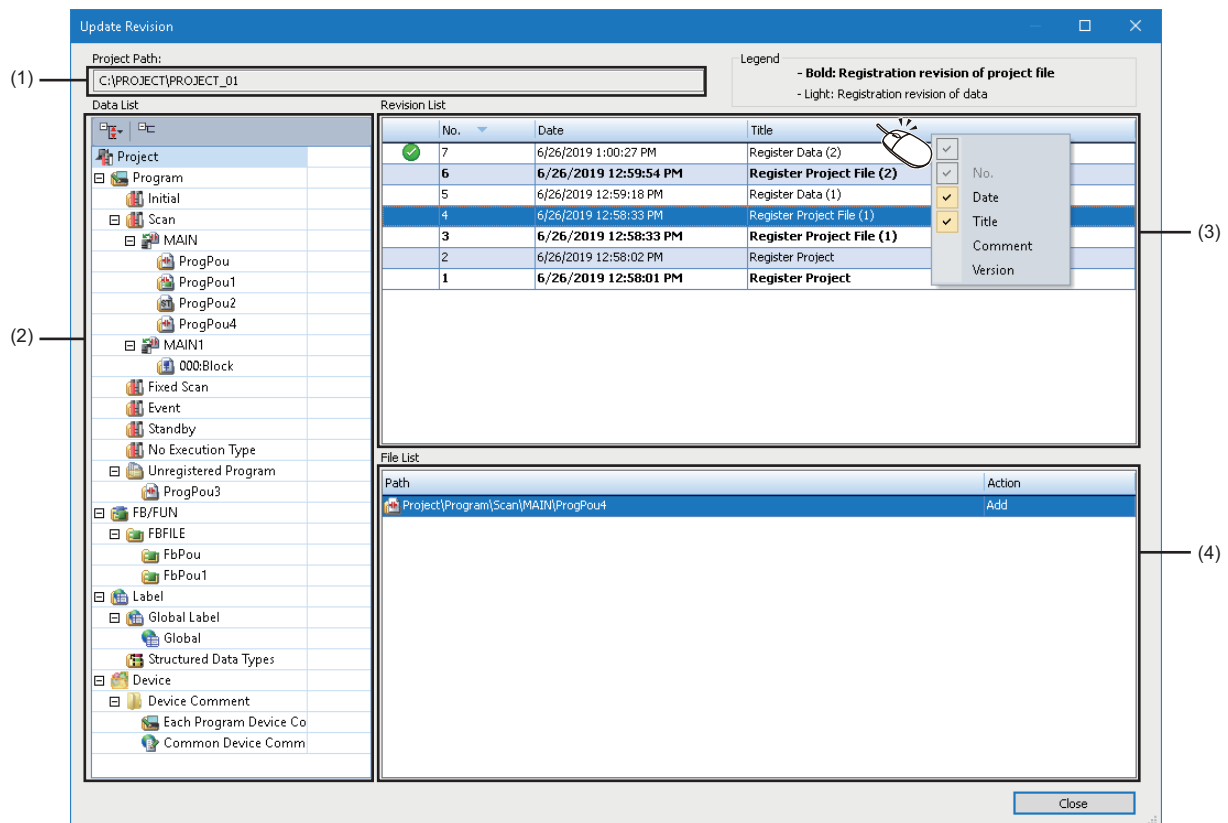
The following operations can also be performed in this screen.

- Page 181 Registering a project file and data
- Page 184 Acquiring a project file and data
- Page 186 Verifying a project file or data
- Page 188 Checking detailed information




Window

Select [Tool] ⇒ [Configuration Management] ⇒ [Update Revision] ().

If a project is not opened, select the project in the screen displayed by selecting this menu.



Displayed items

| Item | Description |
|-------------------|--|
| (1) Project Path | The path to a folder where a master project is managed is displayed. |
| (2) Data List | <p>The following data is displayed in a tree format.</p> <ul style="list-style-type: none"> • Master project data (including data that does not exist in a local project) • Data that exists only in a local project <p>An icon that indicates data status is displayed on the right side of each data. ( Page 179 Icons in the data list)</p> <p>By clicking  (Display the Deleted Data), data which is deleted from a master project and also does not exist in a local project can be displayed. (In gray)</p> |
| (3) Revision List | <p>The update revisions of data selected in the data list is displayed.</p> <p>If data containing lower hierarchy data is selected in the data list, the revisions of both the selected data and its lower hierarchy data are displayed.</p> <p>Revisions of a project file are displayed in bold.</p> <p> is displayed on the left side of a revision of data locally acquired.</p> <p>Items to be displayed can be selected by right-clicking on the column header.</p> |
| (4) File List | Data associated with a revision selected in the revision list is displayed. |

■Management targets of an update revision history

An update revision history of the following data and settings can be managed. The table below shows whether each menu in the "Update Revision" screen is available for each data or setting.

○: Available, ×: Not available

| data/setting | Menu | |
|---|---------------------------------------|---|
| | [Register/Acquire Data] ^{*1} | [Register/Acquire Project File] ^{*2} |
| Program block ^{*3} , FB folder ^{*3} , FUN folder ^{*3} , common device comment, each program device comment | ○ | ○ |
| Project, module configuration diagram ^{*4} , program folder, execution type folder, program file, user folder, FB/FUN folder, FB file, FUN file, label folder, global label folder, global label, structured data types folder, structure, device folder, device comment folder, each program device comment folder, device memory folder ^{*4} , device memory ^{*4} , device initial value folder ^{*4} , device initial value ^{*4} , parameter ^{*4} , unused ladder program, data and settings which are not displayed in the navigation window (for example: program file setting) | × | ○ |

*1 Displayed by selecting and right-clicking data in the data list in the "Update Revision" screen.

*2 Displayed by selecting and right-clicking "Project" in the data list in the "Update Revision" screen.

*3 Includes local labels, program body, and worksheet.

*4 Not displayed in the "Update Revision" screen.

For the following data and settings, the update revision history cannot be managed.


Shortcut key, color and font, display setting for the system monitor, element selection window (including library), docking window, favorite setting in the online data operation screen, display language, profile, toolbar, status bar, each screen state (size, displayed items, content being entered, etc.), conversion state of each data, project revision history


■Icons in the data list

The following table shows the icons displayed in the data list.

| Icon | Name | Description |
|------|---------------------------------|---|
| None | — | No icon is displayed if there is no difference between master project data and local project data. |
| | Change | This icon is displayed when local project data is newer than master project data. In some cases, however, this icon is not displayed even if local project data is edited. (See Page 180 Operations for which an icon is not displayed) |
| | Old | This icon is displayed when local project data is older than master project data. |
| | Conflict | This icon is displayed when data that is older than the latest master project data is edited in a local project. (Example: When data edited in a local project is older than the latest master project data edited by another user, this icon is displayed on the right side of the data.) |
| | Add | This icon is displayed when data is added in a local project. |
| | To be deleted | This icon is displayed when data is deleted from a local project. |
| | Old data to be deleted | This icon is displayed when data that is older than the latest master project data is deleted from a local project. (Example: When data deleted from a local project is older than the latest master project data edited by another user, this icon is displayed on the right side of the data.) |
| | Changes in lower hierarchy data | This icon is displayed when lower hierarchy data is changed in a local project. (Example: When a program block is added, this icon is displayed on the right side of a program file including the program block.) |

■Operations for which an icon is not displayed

When certain operations are performed in the following screens,  (Change) is not displayed on the right side of each data in the data list.

To apply changes in each screen to a master project, register a project file to a version management system. ( Page 181 Project file)

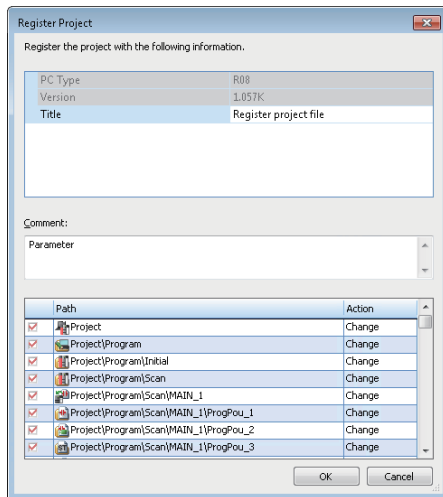
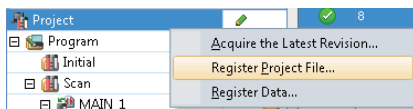
| Screen | Operation |
|---|---|
| Work window | Changing display state (example: arranging work windows) |
| Navigation | Filtering data Sorting data Changing the name of a function block or function |
| Option Print Multiple Comments Display Setting Input the Configuration Detailed Information Tag FB Setting Specify Connection Destination Online Data Operation | Changing settings |
| Label editor | Clicking the [Simple Display] or [Detailed Display] button |
| Program editor SFC Block List | Switching whether to display or hide comments |
| FB Property Management (Offline) | Changing an initial value |
| Device Comment Device Memory | Searching for a device |
| Device Memory | Changing the display format |
| Find and Replace Device List | Changing the search location of a device or label |
| Cross Reference | Selecting the following menu: • [Display] ⇒ [Display Hierarchically] |
| Device/Buffer Memory Batch Monitor | Closing the window after searching for a device |
| Watch | Registering a device or label |
| Intelligent Function Module Monitor | Changing a module registered in the window |

Registering a project file and data

■Project file

To merge all data in a local project into a master project, register the project file in a version management system. The following shows the procedure to register a project file.

Operating procedure

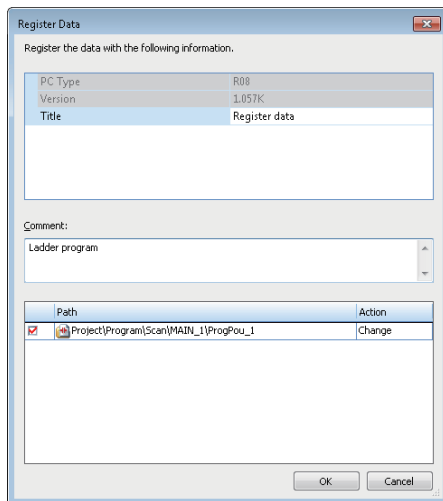
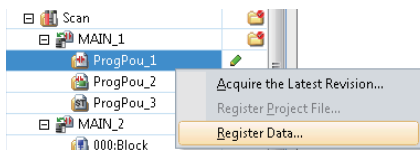


1. Select "Project" in the data list.
2. Right-click it and select [Register Project File] from the shortcut menu.
3. Enter a title and comment in the "Register Project" screen, and click the [OK] button.
(Title: up to 128 characters, Comment: up to 5120 characters)

■Data

To merge only specific data in a local project into a master project, register only the data in a version management system. The following shows the procedure to register only specific data.

Operating procedure



1. Select data in the data list. (Multiple selections allowed.)
2. Right-click it and select [Register Data] from the shortcut menu.
3. Enter a title and comment in the "Register Data" screen. (Title: up to 128 characters, Comment: up to 5120 characters)
4. Select the checkbox of data to be registered, and click the [OK] button.

Point

- Data to be registered can be verified with the latest data in a master project by performing any of the following operations in the "Register Data" screen:
 - Double-click data to be registered.
 - Select and right-click data to be registered, then select [Verify with the Latest Revision] from the shortcut menu.
- Content set for each of following items can be copied by selecting and right-clicking the item in the "Register Data" screen, then selecting [Copy] from the shortcut menu.
 - PC Type
 - Version
 - Title

Precautions

■Cases in which registering a project file is required

If any of the following conditions is satisfied, a project file needs to be registered.

- Content of properties for a project was changed.
- A module was added or deleted.
- The start I/O number of a module was changed.
- A global label or structure was edited.
- A module label, module FB, library, or sample library was added in a project.
- Any of the operations below was performed to a program file, FB file, FUN file, or user folder.

Adding new data

Deleting data

Renaming

Changing content of properties

- The execution type or order for program blocks was changed.
- A device memory or initial device value was added or deleted, or its name was changed.
- A parameter of a module was changed.
- User information or a security key was changed. (👉 Page 189 User information and security key)
- A tag FB whose tag FB type or tag type does not exist in a project was registered in the "Tag FB Setting" screen.

■Security version

For a project whose security version is '2,' it may take time to register a project file or data.

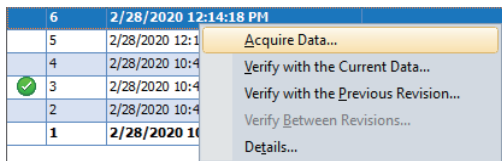
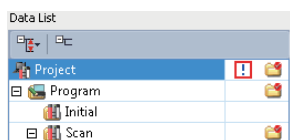
Acquiring a project file and data

■Project file

To merge all data in a master project into a local project, acquire the project file from a version management system.

The following shows the procedure to acquire a project file.

Operating procedure



1. Select "Project" in the data list.

2. Select a revision in the revision list.

3. Right-click it and select [Acquire Data] from the shortcut menu.

When selecting a revision of data, data associated with the following revisions will be acquired.

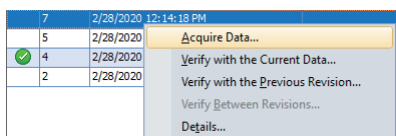
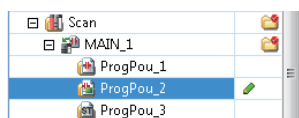
- Selected revision of data
- Latest revision of a project file among the revisions registered earlier than the selected revision of data

■Data

To merge only specific data in a master project into a local project, acquire only the data from a version management system.

The following shows the procedure to acquire only specific data.

Operating procedure



1. Select data in the data list.

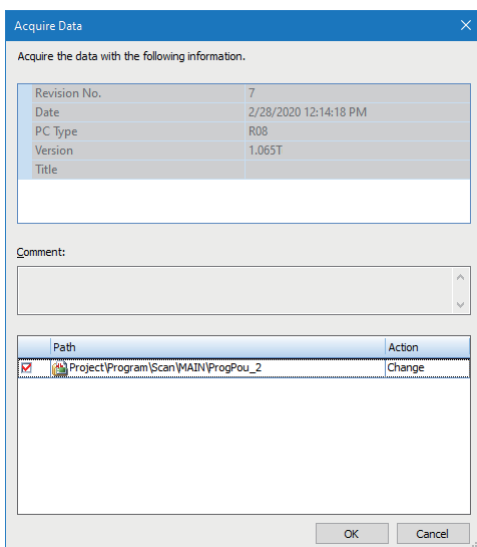
2. Select a revision in the revision list.

3. Right-click it and select [Acquire Data] from the shortcut menu.

If selected data contains lower hierarchy data or multiple data is selected, the "Acquire Data" screen appears.


4. Check the content in "Title" and "Comment."

5. Select the checkbox of data to be acquired, and click the [OK] button.



- The latest data can be acquired by selecting [Acquire the Latest Data] from the shortcut menu after selecting and right-clicking "Project" or each data in the data list of the "Update Revision" screen.
- Content set for each of following items can be copied by selecting [Copy] from the shortcut menu after selecting and right-clicking the item in the "Acquire Data" screen.
 - Revision No.
 - Date
 - PC Type
 - Version
 - Title

Precautions

- Acquired data is in the unconverted state.
- A local project after data acquisition is in the unsaved state.
- The execution order of program blocks may be changed by acquiring data. Check their execution order in the "Program File Setting" screen. ( Page 272 Program execution order setting)
- When acquiring a ladder program including a temporarily changed ladder block, the temporary change of the ladder block will be canceled. However, it will be retained if the ladder program was registered in a version management system at the registration of a project file.
- The following setting is overwritten with the setting of when data to be acquired was registered in a version management system:
 - Editable/non-editable setting for a library
- For a project whose security version is '2,' it may take time to acquire a project file or data.

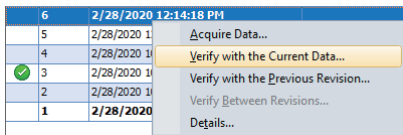
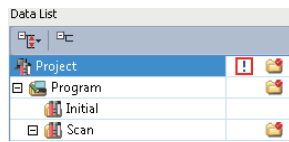
Verifying a project file or data

To check differences between project files or data, verify the project files or the data.

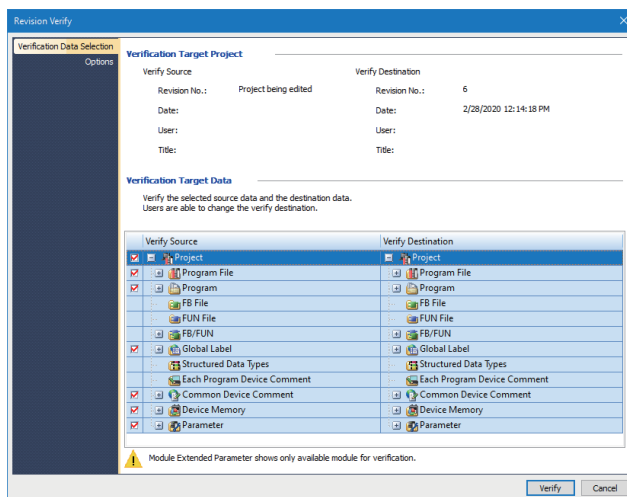
■ Project file

The following shows the procedure to verify the project file of a master project and the one of a local project.

Operating procedure



1. Select "Project" in the data list.
2. Select a revision in the revision list.
3. Right-click it and select [Verify with the Current Data] from the shortcut menu.
4. Click the [Verify] button in the "Revision Verify" screen.



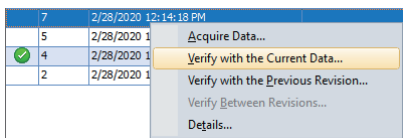
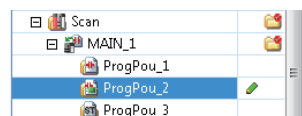
Point

- By selecting and right-clicking a revision in the revision list, then selecting [Verify with the Previous Revision] from the shortcut menu, project files associated with the following two revisions can be verified with each other.
 - Verification source: a selected revision
 - Verification destination: a revision registered one before the selected oneIf a revision of data is selected between the revisions of data and project file which were registered at the same time, a verification destination will be a project file associated with a revision registered one before the revision of project file.
- By selecting two revisions in the revision list, then right-clicking and selecting [Verify Between Revisions] from the shortcut menu, project files associated with the selected revisions can be verified with each other.

■Data

The following shows the procedure to verify specific data in a master project and that in a local project.

Operating procedure



1. Select data in the data list.
2. Select a revision in the revision list.
3. Right-click it and select [Verify with the Current Data] from the shortcut menu.

3

Point

- By selecting and right-clicking a revision in the revision list, then selecting [Verify with the Previous Revision] from the shortcut menu, data associated with the following two revisions can be verified with each other.
 - Verification source: a selected revision
 - Verification destination: the revision registered one before the selected one
- By selecting two revisions in the revision list, then right-clicking and selecting [Verify Between Revisions] from the shortcut menu, data associated with the selected revisions can be verified with each other.

Precautions

- When selecting "Project" in the data list then a revision of data in the revision list, data associated with the following two revisions which were registered one before the selected revision will be set as verification destinations:
 - Revision of a project file
 - Selected revision of data
- When specific data in a master project and that in a local project are verified, the cursor does not jump to the corresponding data in each editor even by double-clicking data displayed in the detailed display (diagram/table format) screen.
- For a project whose security version is '2,' it may take time to verify a project file or data.

■Verification result

The operation method for displaying the verification result is the same as that of project verification. For more details, refer to the following:

☞ Page 153 Checking a verification result

■Verifiable data

Data can be verified only when any of the following data is selected in the data list.

- Project
- Program block (standard, safety)
- FB folder (standard, safety)
- FUN folder (standard, safety)
- Global device comment
- Local device comment

■Unverifiable data

The following data cannot be verified.

- Data that exists only in the verification source
- Data that exists only in the verification destination
- Data whose program language differs between the verification source and the verification destination

If the following passwords are not authenticated, data cannot be verified:

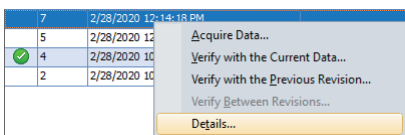
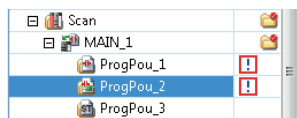
- Block password set for a POU
- Password set in the editable/non-editable setting for a library

Checking detailed information

Details on an update revision of a master project can be checked in the "Details" screen.

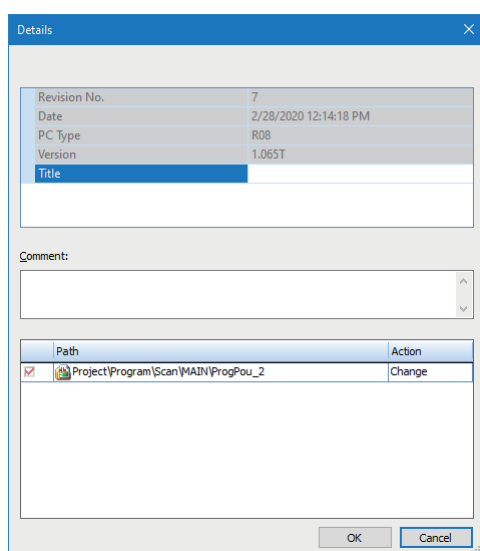
The following shows the operating procedure to display the "Details" screen.

Operating procedure



1. Select data in the data list.
2. Select a revision in the revision list.
3. Right-click it and select [Details] from the shortcut menu.

The "Details" screen appears.



- In the "Details" screen, the title and comment for a revision can be changed.
- Content set for each of the following items can be copied by selecting and right-clicking the item in the "Details" screen, then selecting [Copy] from the shortcut menu.
 - Revision No.
 - Date
 - PC Type
 - Version
 - Title

Precautions

If the title or comment of a revision of a project file is changed, the one of the revisions of data that were created at the same time as the revision of the project file will be changed as well.

Considerations

The following shows the considerations for using the project version management function.

■User information and security key

When acquiring data, settings for the user information and security key in a local project are overwritten with the ones in a master project, and the settings that are not registered in a version management system will be deleted.

A project is closed after data acquisition. Log on to the project with the latest settings when opening it again.

■Access level

Depending on the access level, operations that can be performed differ.

○: Can be performed, ×: Cannot be performed

| Operation | Access level | | | |
|--------------------------------------|----------------|-----------------|----------------------|-------|
| | Administrators | Developers | Assistant Developers | Users |
| Acquiring a project | ○ | ○ | ○ | ○ |
| Registering a project | ○ | ○ | ○ | × |
| Checking an update revision history | ○ | ○ | ○ | ○ |
| Acquiring data | ○ | ○ | ○ | ○ |
| Registering data | ○ | ○ ^{*1} | ○ ^{*1} | × |
| Verifying with the latest revision | ○ | ○ | ○ | × |
| Verifying with current data | ○ | ○ | ○ | ○ |
| Verifying with the previous revision | ○ | ○ | ○ | ○ |
| Verifying between revisions | ○ | ○ | ○ | ○ |
| Checking detailed information | ○ | ○ | ○ | ○ |

*1 A program file cannot be registered.

■Block password

When acquiring data for which a block password is set, the block password of a local project is overwritten with the one of a master project.



In addition, data for which a block password is set cannot be registered or verified if the block password does not match between a local project and master project.

If the block password of a master project is acquired in registering or verifying data, the block password of a local project is overwritten with the one of the master project; therefore, the password authentication will be required.

■Data reading from a programmable controller

When writing a local project to a programmable controller and then reading the project, an unexpected icon may be displayed in the "Update Revision" screen.

Ex.

When writing data in a local project, which matches to the latest data in a master project, to a programmable controller and then reading the project,  (Past) is displayed on the right side of the following data in the "Update Revision" screen.  is not displayed in the revision list.

- Program block
- User folder
- FB folder
- FUN folder
- Global label
- Structure
- Data of which the name is prefixed with 'M+', 'M_', 'P+', or 'P_'.

■Data writing to a programmable controller and online program change

The following shows the considerations when writing a local project to a programmable controller, acquiring a project file or data from the version management system, and then writing the file or data to the programmable controller again.

- Data writing to a programmable controller: Can be performed but a program needs to be converted before it is written to a programmable controller.
- Online program change: Cannot be performed.

■Project revision history

The revision history of a local project is not deleted even if a project file is acquired from a version management system.

■Functions of Subversion

Subversion (SVN) is embedded in GX Works3 to use the project version management function.

However, do not use the functions of Subversion for a master project.

Troubleshooting

The following tables show messages displayed while using the project version management function and corrective actions.

Registering a project

| Message | Cause | Corrective action | |
|---|---|--|-----------------------------------|
| Unable to register the project version management information to the specified path. Please specify a path again. | A path where project information cannot be registered is specified. | Respecify a path, then register the project again. | Page 176 Registering a project |
| Failed to register the project. Please execute Register Project again. | A project cannot be registered in a version management system. | Check the following contents, then register the project again: | |
| | A version management system cannot be connected. | • Is the personal computer connected to a network? | |
| | An update revision cannot be recorded. | • Is there sufficient free space on the personal computer (server)? | |
| | A directory of specified path cannot be accessed. | • Is the specified path correct? • Does a user have the access right for the directory of specified path? | |
| An unconverted ladder was found. Please execute the operation after converting the program. | A ladder program is not converted. | Convert the ladder program, then register the project again. | |
| A project whose user access level is 'Users' was specified. Unable to register the project. Please specify a project other than the one whose user access level is 'Users.' | A project is logged on to as a user whose access level is 'Users.' | Log on to the project as a user with an access level other than 'Users,' then register the project again. | |

Acquiring a project

| Message | Cause | Corrective action | |
|--|---|---|---------------------------------|
| GX Works3 project version management information does not exist in the specified path. Please specify the path to get the management information from. | A path where project information does not exist is specified. | Respecify the path, then acquire the project again. | Page 177 Acquiring a project |
| Failed to acquire the project. Saved project before acquiring the project is opened if it is found. Please execute Acquire Project again. | A local project cannot be created. | Check the following contents, then acquire the project again: | |
| | A version management system cannot be connected. | • Is the personal computer connected to a network? | |
| | An update revision cannot be recorded. | • Is there sufficient free space on the personal computer (server)? • Is the specified path correct? • Does a user have the access right for the directory of specified path? | |

Checking an update revision history

| Message | Cause | Corrective action | |
|---|--|---|--|
| Failed to show the update revision dialog because the project version management information cannot be acquired. Please execute Register Project again. | GX Works3 is forcibly terminated. | Perform the following operations, then check the update revision history: ① Create a local project again.* ¹ ② If the history is not displayed properly even after performing step ①, delete the master project and then register the project again.* ² | Page 177 Acquiring a project Page 177 Deleting a master project |
| | A network is disconnected. | | |
| | A master project is deleted. | Register the project again, then check the update revision history. | Page 176 Registering a project |
| | The name of a master project is changed. | Perform either of the following operations, then check the update revision history: • Change the name back to the original. • Register the project again. | |
| The specified project has not been controlled by a project version management. Please execute Register Project or Acquire Project. | A selected project is not a local project. | Select a local project in the screen displayed after selecting the following menu. • [Tool] ⇒ [Configuration Management] ⇒ [Update Revision] Alternatively, select this menu after opening a local project. | Page 178 Update Revision screen |

*1 Data which was edited before the acquisition will be deleted since a new local project is acquired.

*2 A new update revision history will be created since a new project is registered.

Registering a project file and data

| Message | Cause | Corrective action | |
|--|---|--|---|
| Unable to register data because data inconsistency occurs. The following are the possible causes. Please check a manual for corrective actions for causes. • The same named data exists in the same type of the project to register • Program language data of SFC and other ones are included • Block No. which is used in another block is used as the Block No. of SFC | Data with the same execution type and the same name as data to be registered exists in a master project. | Change the data name, and then register the data again. | Page 181 Registering a project file and data |
| | Data created in Sequential Function Chart language and data created in another language exist in a same program file of a master project. | Register the data created in Sequential Function Chart language and the data created in another language separately. | |
| | A block number of an SFC block is duplicating with that of another SFC block. | Change the block number, then register the data again. | |
| Unable to execute because another user is registering data. Please execute it again after a while. | Another user is registering data in a version management system. | Register the data again after a while. | |
| Failed to register the data. Please execute Register Data again. | A version management system cannot be connected. | Check the following contents, then register the data again: • Is the personal computer connected to a network? • Can a folder where the master project is managed be accessed? | |
| | An update revision cannot be recorded. | | |
| Unable to register some data because the maximum number of creatable data is exceeded. Please correct so that it does not exceed the maximum number of creatable data. | There is a data type including pieces of data which exceeds its maximum number that can be created. | Reduce the number of pieces of data to be registered, then register the data again. | |
| The entire project is required to be registered for the selected data. Unable to register the entire project by the users other than Administrators. Please execute it again after logging on as Administrators. | A project is logged on to as a user whose access level is other than 'Administrators.' | Log on to the project as a user with the access level 'Administrators,' then register the data again. | |

Acquiring a project file and data

| Message | Cause | Corrective action | |
|---|--|---|---|
| <p>Unable to acquire data because data inconsistency occurs. The following are the possible causes. Please check a manual for corrective actions for causes.</p> <ul style="list-style-type: none"> • The same named data exists in the same type of the project to be acquired from • Program language data of SFC and other ones are included • Block No. which is used in another block is used as the Block No. of SFC | Data with the same execution type and the same name as data to be acquired exists in a local project. | Change the data name, then acquire the data again. | Page 184 Acquiring a project file and data |
| | Data created in Sequential Function Chart language and data created in another language exist in a same program file of a local project. | Acquire the data created in Sequential Function Chart language and the data created in another language separately. | |
| | A block number of an SFC block is duplicating with that of another SFC block. | Change the block number, then acquire the data again. | |
| <p>Failed to acquire the data. Please execute Acquire Data again.</p> | A version management system cannot be connected. | Check the following contents, then acquire the data again: | |
| | An update revision cannot be recorded. | <ul style="list-style-type: none"> • Is the personal computer connected to a network? • Can a folder where the master project is managed be accessed? | |
| <p>Unable to acquire data because data inconsistency occurs. The following is the possible cause. Please acquire data so that data inconsistency does not occur.</p> <ul style="list-style-type: none"> • Some data causes a circular reference. | There is data which will cause a circular reference if acquired. | <p>Modify data so that a circular reference does not occur.</p> <p>Then, acquire the data again.</p> | |

3.9 Managing Profiles

The registration status of a profile (such as CSP+^{*1}) can be managed.

A profile is data that stores information of a connected device (such as a model name.)

Before registering/updating/deleting a profile, log on to a personal computer as a user with the administrator authority, and close the project in advance.

^{*1} For CSP+, refer to the CC-Link Partner Association website (www.cc-link.org).

Registration/update

A profile can be registered in GX Works3.

By registering a profile, a connected device is added to the module list in each network configuration window.

If a profile is already registered, it will be updated (overwritten).

Operating procedure

1. Select [Tool] ⇒ [Profile Management] ⇒ [Register].
2. Select a file in the "Register Profile" screen, and click the [Register] button.

When opening a project next time, the added/updated device can be checked in the module list of each network configuration window.

To apply information of the added/updated device to the project, overwrite the project.

Point

- A profile is managed by each personal computer, and shared within GX Works3 and other MELSOFT products. Therefore, a profile registered in GX Works3 is applied to other MELSOFT products.
- A profile is a compressed file (such as *.zip, *.ipar, and *.cspp). Register a profile without decompressing.

Deletion

A profile registered in GX Works3 can be deleted.

Operating procedure

1. Select [Tool] ⇒ [Profile Management] ⇒ [Delete].
2. Select the checkbox of a model name to be deleted in the "Profile Delete" screen, then click the [Delete] button.

4 CREATING MODULE CONFIGURATION DIAGRAM AND SETTING PARAMETERS

In GX Works3, parameters of a programmable controller can be set in the "Module Configuration" window, as if to configure the actual system.

Parameters can also be set in the navigation window in the same manner as GX Works2.

Module configuration window

The following operations can easily be performed in the "Module Configuration" window.

| Item | Reference |
|---|---|
| Displaying the configuration of an actual programmable controller system visually ^{*1} | Page 196 Creating a Module Configuration Diagram |
| Setting the parameters of various modules ^{*1} | Page 201 Setting parameters on the module configuration diagram |
| Entering the start XY in a batch ^{*2} | Page 206 Inputting the start XY in a batch |
| Entering the default points in a batch ^{*2} | Page 206 Inputting default points in a batch |
| Checking the power supply capacity and I/O points ^{*1} | Page 206 Checking the power supply capacity and I/O points |
| Checking a system configuration ^{*1} | Page 206 Checking a system configuration |

*1 LHCPUs do not support it.

*2 LHCPUs and FX5CPUs do not support it.

Parameter settings

Parameters can be set by any of the following methods.

| Method | Reference |
|---|---|
| Setting parameters in the "Input the Configuration Detailed Information" window that is displayed from the "Module Configuration" window. ^{*1} | Page 201 Setting parameters on the module configuration diagram |
| Setting parameters in a parameter editor that is displayed from the navigation window. | Page 207 Setting Parameters |

*1 LHCPUs do not support it.

4.1 Creating a Module Configuration Diagram

A module part (object) can be placed in the "Module Configuration" window in the same configuration as an actual system. In the "Module Configuration" window of GX Works3, a module configuration diagram can be created in the range of a system that is controlled by a CPU module in a project.

Editor configuration when creating a module configuration diagram

Point

The display setting can be changed by setting the following option.
[Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Module Configuration Diagram"

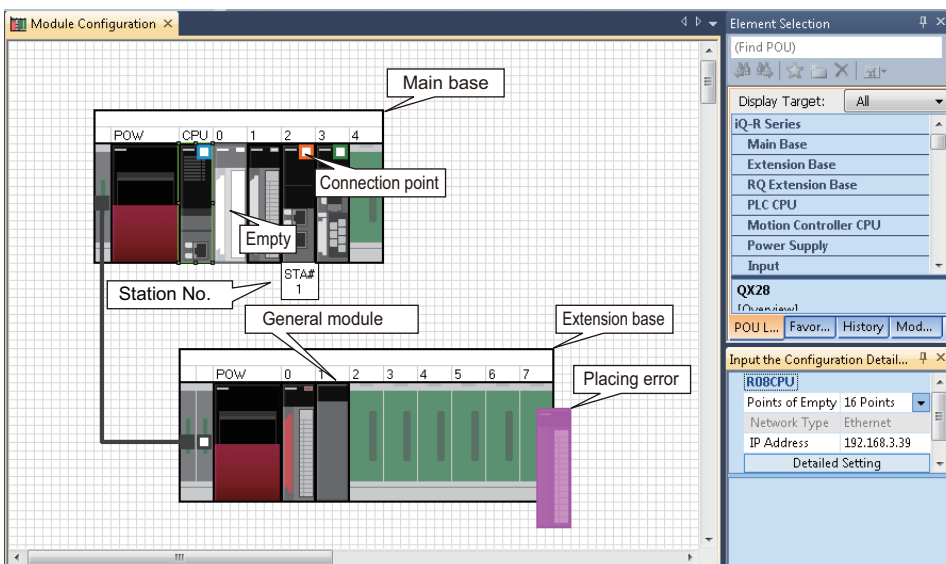
Window

Double-click "Module Configuration" in the navigation window.

■ Toolbar



■ "Module Configuration" window



Displayed items

| Window name | Item | Description |
|--|--|---|
| Module Configuration | iQ-R series | An object of a MELSEC iQ-R series module supported by GX Works3 |
| | FX5 series | An object of a MELSEC iQ-F series module supported by GX Works3 |
| | Q series | An object of a MELSEC-Q series module supported by GX Works3 |
| | General module | An object of a module for which the start XY and point can be set arbitrarily for each module type. The same points as empty slot points will be assigned to an initial value. Select this when using a module which is not included in the element selection window. |
| | Figure (Straight Line, Rectangle, Ellipse, Text Box) | An object that is used when adding information such as description on the module configuration diagram |
| | Connection line | An object of a bus cable to be connected to a base unit |
| | Connection point | A point to be connected with a connection line. The connection point located at the upper right on a module is used when importing a project in MELSOFT Navigator. It is not used in GX Works3. |
| | Module status setting (empty) | A module to set when running a system only on the module configuration diagram without using actual modules. A module placed on the module configuration diagram and its related parameters will also be set as 'Empty.' (Reserved status) |
| | Object placement error | A module object which is not placed properly is highlighted. |
| | Station No. | The station number set for a module is displayed. The station number of the following modules is not displayed. • A remote head module on a standby system • A module controlled by another CPU module |
| Element Selection | | A list of objects which can be used on the module configuration diagram |
| Input the Configuration Detailed Information | | A window to enter the information such as start XY or station number of the module placed on the module configuration diagram |

Placing objects

Placing module objects

Operating procedure

1. Select a main base unit in the element selection window, and drag and drop it onto the "Module Configuration" window.
2. Select a module in the element selection window, and drag and drop it onto the base unit placed in step 1.

The available locations are highlighted while dragging the module.

Point

The names of module objects can be changed in the "Properties" screen. It makes easy to distinguish modules with the same model names.

Precautions

- The following are not supported: GOT2000/GOT1000 series, general modules, image diagrams, and link files supported by MELSOFT Navigator
- Only bus cables are available. Network connection and serial connection are not available.
- For FX5CPUs, select a module directly and drag and drop it onto the "Module Configuration" window.

■Moving placed modules

If a module is removed from the main base unit or extension base unit, the object information such as start I/O and parameter information is retained. Therefore, when the removed module is placed on the base unit again, the retained parameter information will be set automatically.

A module removed from the base unit will be deleted in "I/O Assignment Setting" of "System Parameter."

For FX5CPU, the setting cannot be fixed in the state where a module has been removed from the CPU module.

■Deleting placed modules

When a module is deleted, the module information displayed in the navigation window after fixing parameters will be deleted as well.

For a single CPU configuration, a CPU module object cannot be deleted.

For a multiple CPU configuration, the host CPU cannot be deleted.

■Copying and pasting modules

Copy source parameter information is utilized.

If a CPU module placed on the base unit in a multiple CPU configuration is copied, the CPU number will be unknown.

The objects can be copied to the "Module Configuration" window of other projects.

Placing figure objects

A figure and text box can be placed in the "Module Configuration" window.

A figure placed in the "Module Configuration" window is not written to a CPU module. It is saved only in a project.

Operating procedure

The font and color of a figure object can be changed in the "Properties" screen.

Select a figure in "Figure" in the element selection window, and drag and drop it onto the "Module Configuration" window.

Changing the model name of a CPU module

The model name of a CPU module placed on the module configuration diagram can be changed.

RCPUs do not support this change.

Operating procedure

1. Select and right-click a placed CPU module, then select [Change CPU Model Name] from the shortcut menu.
2. Select the model name after the change in the "Change CPU" screen.

Precautions

The model name cannot be changed to the one of different module type.

Module status setting (empty)

Set this when operating a system without mounting actual modules.

The module is highlighted in a pale color.

FX5CPUs do not support this setting.

Operating procedure

Select a module to be set to empty, and [Edit] ⇒ [Module Status Setting (Empty)].

Reading the module configuration from an actual system

The module configuration diagram can be configured by using the information read from a CPU module.

For an FX5CPU, a module, the model name of which cannot be identified, is placed as a general module on the module configuration diagram.

If a module except for CPU No.1 is set as the connection destination when reading information from a remote head module in a redundant system configuration, the CPU No.1 is read as the host module.

Operating procedure

Select [Online] ⇒ [Read Module Configuration from PLC].

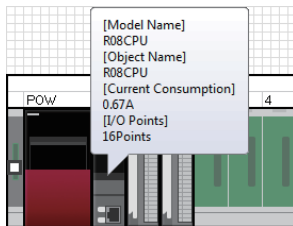
Precautions

The module configuration cannot be read when the number of extension base units was set incorrectly.

Checking the module information

Checking on a balloon help

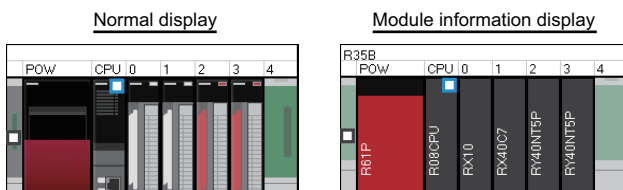
Place the cursor on an object (such as module or figure) to display the balloon help on the "Module Configuration" window.



Displaying model names on module objects

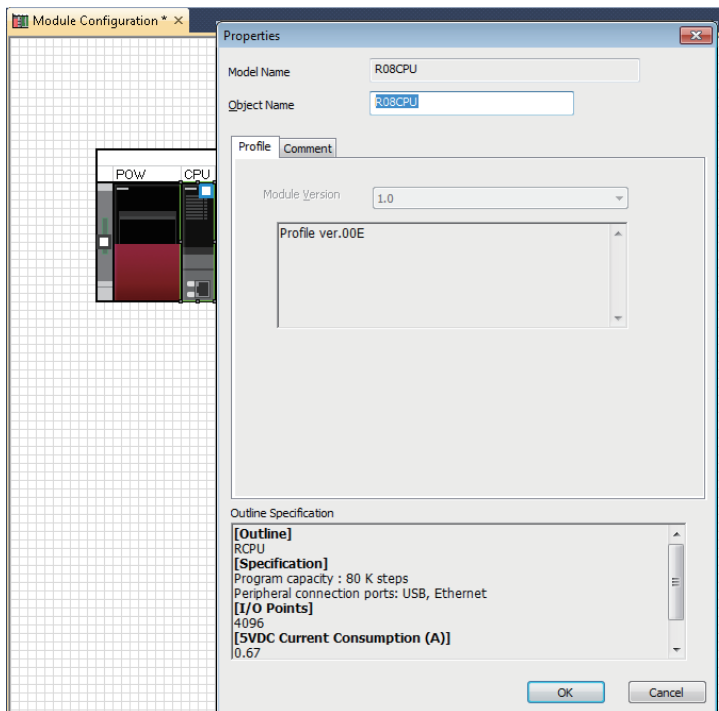
Operating procedure

Select [Edit] ⇒ [Display Module Information] ().



Checking in the property screen

A model name, object name, and outline specification of a module can be checked in the "Properties" screen. Additionally, a comment can be entered.





Operating procedure

Select and right-click a module object on the module configuration diagram, then select [Properties] from the shortcut menu.

Setting parameters on the module configuration diagram

Parameters of a module placed onto a module configuration diagram can be set in the "Input the Configuration Detailed Information" window.

Operating procedure

1. Select a module object to edit the parameters.
2. Select [Edit] ⇒ [Parameter] ⇒ [Detailed Configuration Information Input Window]().
3. Set each item in the "Input the Configuration Detailed Information" window.
4. Select [Edit] ⇒ [Parameter] ⇒ [Fix] (.

To set details of the module, click the [Detailed Setting] button in the "Input the Configuration Detailed Information" window and set details in the parameter editor displayed.

4

Operations that make parameters unfixed

When an object is edited in the "Module Configuration" window, the status of parameters may be unfixed.

The following shows the list of operations that make parameters unfixed.

- Connecting modules
- Setting module status (empty)
- Undoing/redoing
- Entering the start XY in a batch
- Entering the default points in a batch
- Operations in the "Input the Configuration Detailed Information" window
- Adding or deleting a module
- Cutting and pasting modules
- Changing the property of a module
- Removing a module, or placing the same module to the slot of a base unit again
(For FX5CPU, removing a module or connecting the same module to a CPU module)

Data updated after fixing parameters

The following data is updated after fixing parameters.

- Navigation window
(When parameters of a newly placed module are fixed, the parameters of the module are added under "Module Information" in the navigation window.)
- Parameter editor
- "I/O Assignment Setting" of "System Parameter"

Application of parameter information

The parameter information of a cut or copied module object can be utilized by pasting the module object onto the "Module Configuration" window and fixing the parameters.

Precautions

Parameter information cannot be utilized by the following operations. The parameter information of the pasted module object is returned to the default.

- Paste a cut or copied module object onto the "Module Configuration" window in another project.
- Before fixing parameters, change the station type of the module object in the "Input the Configuration Detailed Information" window.

List of the changed location of start XY number

When the start XY number of a module is changed on the module configuration diagram, the list of data which will be affected by the change is displayed in the "Module Start I/O No. Related Area" window. Check the details and correct the data.

- Affected data: Program, FB program, system parameter, CPU parameter, module parameter, global label (including a structure), and module label
- Affected device: Start XY devices specified for the arguments of FROM(P), DFROM(P), TO(P), DTO(P), TYPED, or TYPEDP instructions

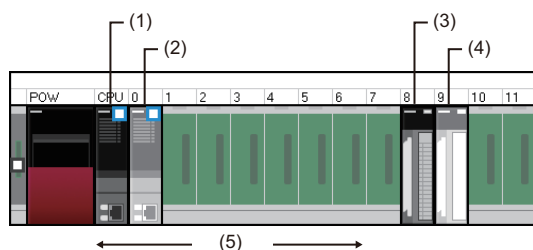
FX5CPUs do not support this function.

Multiple CPU configurations

RnPCPUs (redundant mode), RnPSFCPUs, FX5CPUs, and remote head modules cannot be used for configuring a multiple CPU system.

Display for a multiple CPU configuration

The multiple CPU configuration can be set on the module configuration diagram.



| Item | Description |
|---|--|
| (1) Host CPU module | For a multiple CPU configuration, only one project which is set as a host CPU can be set. |
| (2) Another CPU module | Set a CPU module which is not set as a host CPU to another station. The module is highlighted in a pale color, same as when the module status setting (empty) is set. |
| (3) Module controlled by the host CPU module | A module that is controlled by the CPU module set as a host CPU |
| (4) A module controlled by another CPU module | A module that is controlled by the CPU module set as another CPU. The module is highlighted in a pale color, same as when the module status setting (empty) is set. |
| (5) Available slots for CPU modules | Up to four CPU modules can be placed on the CPU slot and slot 0 to 6. The placed CPU modules are assigned a number, CPU No.1 to CPU No.4 starting from the left. |

Settings of the multiple CPU configurations

In a multiple CPU configuration, place two or more CPU modules on the base unit.

The control CPU module of a module can be changed in the "Input the Configuration Detailed Information" window.

The following explains the method for changing a single CPU configuration to/from a multiple CPU configuration.

■Changing a single CPU configuration to a multiple CPU configuration

Drag and drop a CPU module from the element selection window in a single CPU configuration (a state where one CPU is placed on the base unit), and place the second CPU module on the base unit.

■Changing a multiple CPU configuration to a single CPU configuration

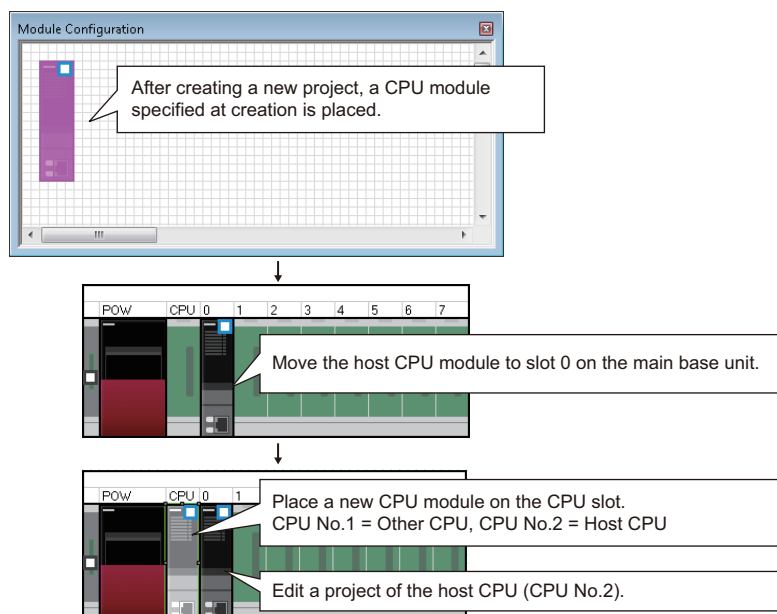
Delete one CPU module (or remove it from the slot) in a multiple CPU configuration (a state where two or more CPU modules are placed on the base unit), and keep only one CPU module on the base unit.

Changing CPU number of the CPU module set as a host CPU

For a multiple CPU configuration, the CPU number of a CPU module placed on the base unit is set in order from the left. To change the CPU number, change the position of the CPU module.

■Operation for single CPU configuration

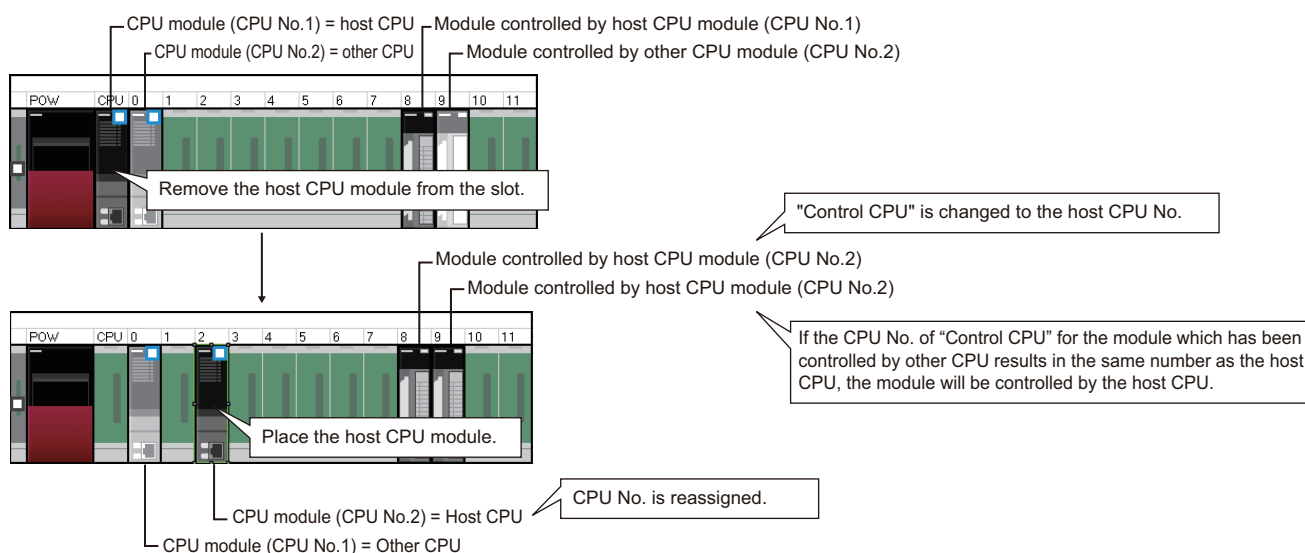
Move the CPU module placed on the CPU slot to an empty slot, and place a new CPU module on the empty slot.



■Operation for multiple CPU configurations

Exchange the CPU module on the CPU slot and the CPU module on other slot.

Since the parameter information of the modules removed from the base unit is retained, the retained information is succeeded when the removed modules are placed again.



Display for a multiple CPU configuration using an RnENCPU

When constructing a multiple CPU system where an RnENCPU is set as CPU No.1, the display of the configuration on the module configuration diagram in GX Works3 differs from the actual module configuration.

For details on the multiple CPU configuration using an RnENCPU, refer to the following:

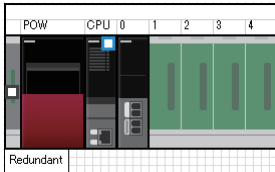
📖 MELSEC iQ-R Module Configuration Manual

Redundant system configurations

Display for an RnPCPU (redundant mode) configuration

For an RnPCPU (redundant mode) configuration, the configuration of either the control system or standby system can be created on the module configuration diagram.

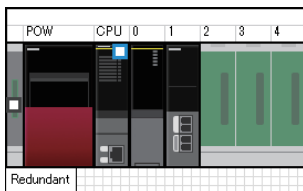
When an RnPCPU (redundant mode) and a redundant function module (R6RFM) are placed on the module configuration diagram, "Redundant" is displayed at the bottom left of the base unit to indicate that it is a redundant system.



Display for an RnPSFCPU configuration

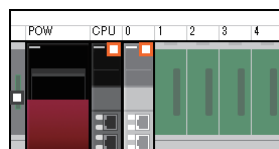
For an RnPSFCPU configuration, the configuration of either the control system or standby system can be created on the module configuration diagram.

When an RnPSFCPU, a SIL2 function module (R6PSFM), and a redundant function module (R6RFM) are placed in this order, "Redundant" is displayed at the bottom left of the base unit to indicate that it is a redundant system.



Display for a remote head module configuration

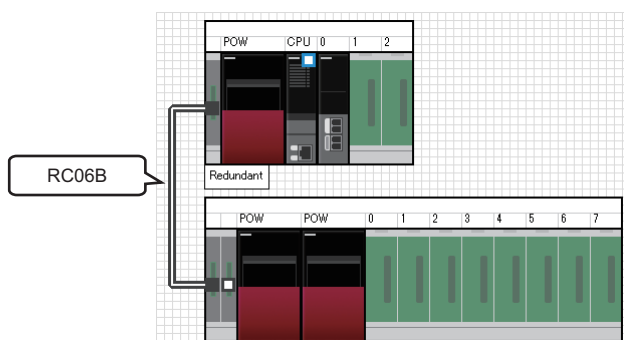
For a redundant system configuration of remote head modules, two remote head modules need to be placed onto the CPU slot and slot 0 of a main base unit on the module configuration diagram.



Display for a redundant extension base unit configuration

In the following cases, two extension cables are regarded as the same model and displayed with a double line on the module configuration:

- A redundant extension base unit is connected to a main base unit on which a redundant function module (R6RFM) is placed.
- Redundant extension base units are connected to each other.



Inputting the start XY in a batch

The start XY of each module can be set in order of the slot number in a batch.
FX5CPUs do not support this.

Operating procedure

Select [Edit] ⇒ [Start XY Batch Input] ()

Inputting default points in a batch

For all modules and empty slots on the module configuration diagram, points including empty slots and on the empty slot side (for a module which occupies two or more slots) can be changed to the default in a batch.
FX5CPUs do not support this.

Operating procedure

Select [Edit] ⇒ [Default Points Batch Input].

XY assignment display

Input and output number assignment for each module can be displayed.
RCPU's do not support this.


Operating procedure

Select [Edit] ⇒ [XY Assignment Display].

Checking the power supply capacity and I/O points

Whether the power supply capacity and I/O points in the configuration on the module configuration diagram exceed the upper limit can be checked.


Operating procedure

1. Select [Edit] ⇒ [Check] ⇒ [Power Supply Capacity and I/O Points] ()
2. Check the result displayed on the "Result of Power Supply Capacity and I/O Points Check" window.

Checking a system configuration

Whether the place of each module on the module configuration diagram is correct can be checked. The result is displayed on the "Output" window.

Operating procedure

1. Select [Edit] ⇒ [Check] ⇒ [System Configuration] ()
2. Check the result displayed on the "Output" window.

Operations for Write to PLC/Read from PLC

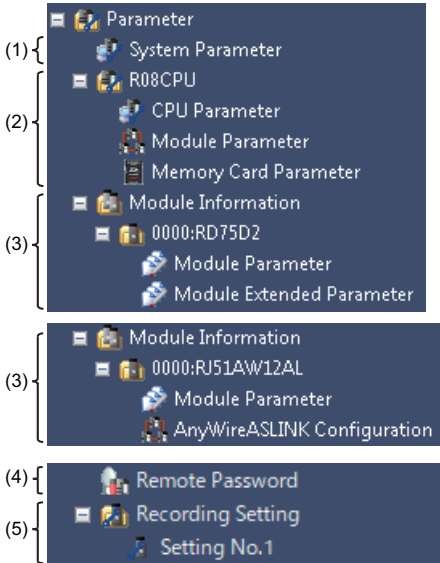
Only parameters of the modules in the information of the module configuration diagram can be read/written.
After reading data from a programmable controller, the coordinate position of the modules on the module configuration diagram is displayed by default status.
The figure information is deleted.

4.2 Setting Parameters

The following shows the parameter settings displayed in the navigation window.

To operate a programmable controller, setting parameters for the modules is required.

Project for an RCPU/LHCPU/FX5CPU

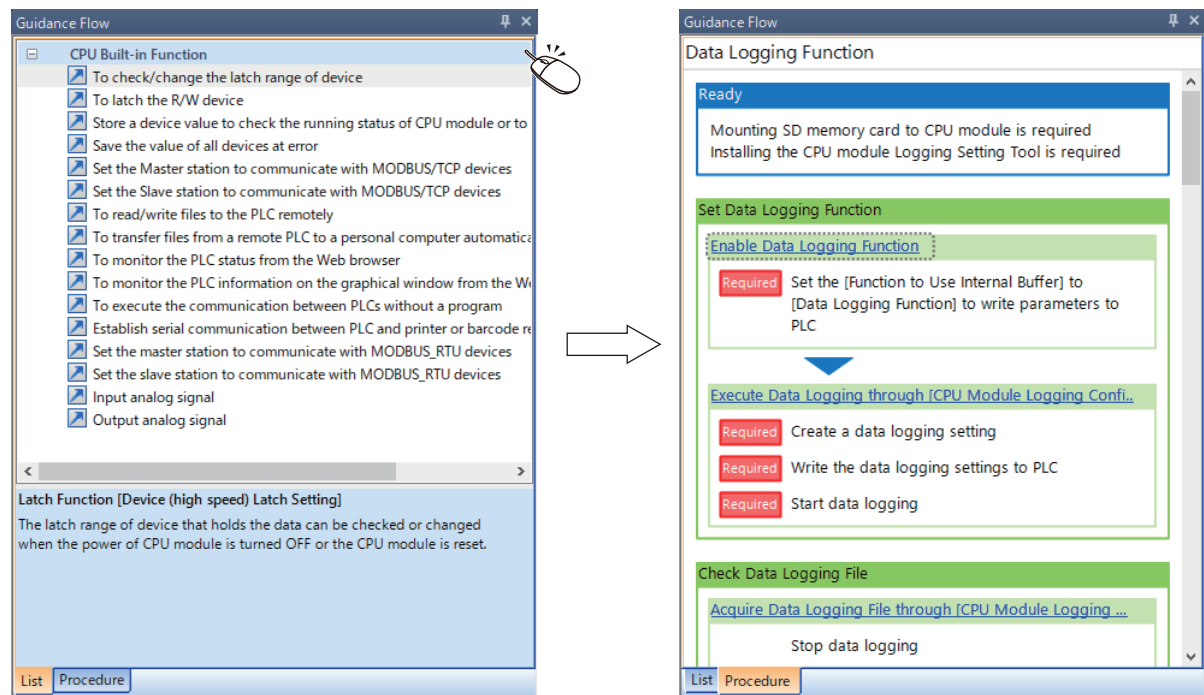
| Image | Item | Description | Reference |
|---|----------------------------------|---|---|
| <p>(Example) Project for an R08CPU</p>  | (1) System parameters | Parameters to set the items required to configure a system such as a module configuration. The term 'System' here indicates the following contents. <ul style="list-style-type: none"> RCPU: A series of system which consists of a main base unit, an extension base unit, and an RQ extension base unit which are connected with extension cables FX5CPU: A system which consists of modules and adapters which are attached to a CPU module | Page 211 Setting system parameters |
| | (2) Parameters for a control CPU | Parameters to set the self operation function of a CPU module. This includes the file setting, memory/device setting, and program setting. | Page 213 Setting parameters of control CPU |
| | (3) Module information | Parameters for modules. There are two types, module parameters and module extended parameters. <ul style="list-style-type: none"> Module parameters: Parameters for each module. The initial setting values and refresh settings of each module are included. Module extended parameters: Parameters for specific intelligent function modules and network modules. These are read and written separately with module parameters. For AnyWireASLINK master modules, "AnyWireASLINK Configuration" to configure a network and connection for target devices is displayed. | Page 214 Setting parameters of modules Page 217 Setting network configuration and target devices |
| | (4) Remote password | By setting a password for each communication route to a CPU module, the communication route is protected; thus, access to the CPU module from an external device without password authentication is prohibited. | Page 724 Restricting Access from Other Than Specific Communication Route (Remote Password) |
| | (5) Recording setting | Setting data for the recording function | Page 759 Settings of the recording function |
| | | | |

Guidance flow function

The setting procedure of parameters can be checked in a flow.
In addition, the cursor can jump to a setting item from each item on the flow.
Only FX5CPUs support this function.

Window

Select [View] ⇒ [Docking Window] ⇒ [Guidance Flow].



The following table shows the icons displayed in the [List] tab.

| Icon | Description |
|------|---|
| | Indicates that a flow of the guidance can be displayed. |
| | Indicates that a flow of the guidance is being displayed. |

Operating procedure

1. Double-click the guidance according to the purpose in the [List] tab.
2. Set parameters by following a flow displayed on the [Procedure] tab.

By clicking a link on the flow, the cursor can jump to a parameter item, setting screen, or setting tool that required to be set.

Point

In the "Ready" column of the flow, an operation that needs to be performed in other than GX Works3 is displayed.

Common operations for parameter settings

Operation for a parameter editor

The items of the system parameter, control CPU parameter, and module information are displayed.

Set each item by referring to the information displayed in "Explanation."

0030:RJ71EN71(CCIEF) Module Parameter

Setting Item List

Input the Setting Item to Search

Setting Item

| Item | Setting |
|--------------------------|------------------|
| Station Type | Local Station |
| Network Number | 1 |
| Station Number Settings | Parameter Editor |
| Station Number | 1 |
| Parameter Setting Method | Parameter Editor |

Explanation

Set station number of CC-Link IE field network module.
[Setting Range]
1 to 120
Master station is not required to set because '0' is fixed.
If 'Sub-Master setting' select the 'work by Host parameter', please configure the 'Station No.' for master station by 'Network Configuration Setting'.

Status color [color/ background color]

- No errors
Default setting: Blue/White
Other than default: Black/White
- With errors: White/Red
- No settings required: Black/Gray

Status icons

- ✓ Changed from default
- ✗ Error

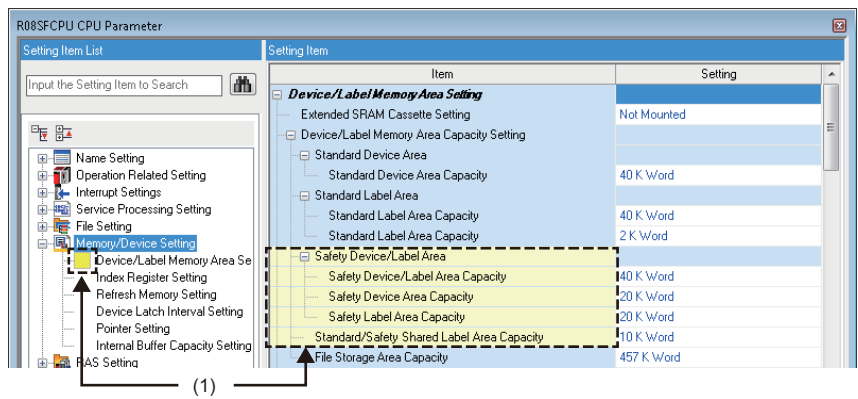
4



By entering a keyword, setting items and explanations can be searched.

Safety data identification display

For safety data, the grid background color is emphasized.



(1): Setting and items for safety

Checking parameters

There are two methods for checking whether there is any error in parameters as follows:

| Purpose | Operating procedure |
|--|---|
| Checking if an input error occurs in a parameter editor | Click the [Check] button in the parameter editor. |
| Checking if an error related to the parameter settings in a project occurs | Select [Tool] ⇒ [Check Parameter]. |

Setting system parameters

Set the parameters relating to whole system such as the I/O assignment setting, the multiple CPU setting, and the inter-module synchronization setting.

For details on the setting items of the parameters, refer to the following:

| Parameter | Reference |
|--|--|
| I/O assignment setting | MELSEC iQ-R Module Configuration Manual MELSEC iQ-F FX5 User's Manual (Application) |
| Multiple CPU setting ^{*1} | MELSEC iQ-R CPU Module User's Manual (Application) |
| Inter-module synchronization setting ^{*2} | MELSEC iQ-R Inter-Module Synchronization Function Reference Manual |

*1 RnPCPUs (redundant mode), RnPSFCPUs, LHCPUs, FX5CPUs, and remote head modules do not support it.

*2 Remote head modules in the redundant system configuration, RnPCPUs (redundant mode), RnPSFCPUs, LHCPUs, and FX5CPUs do not support it.

Setting parameters

Operating procedure

1. Double-click "Parameter" ⇒ "System Parameter" in the navigation window.
2. Select the items to be set in the [I/O Assignment] tab, [Multiple CPU Setting] tab, or [Inter-module Synchronization Setting] tab.
3. Set each item and click the [OK] button.

■When a module is deleted in the I/O assignment setting

"Unset" is displayed for the parameter of the deleted module in the navigation window. To restore the settings (to display them in the I/O assignment setting again), select the mounting position in the "Properties" screen.

■When the I/O assignment setting is read from the read mounting status

For an extension base unit in which the number of extension bases was set incorrectly, the mounting status (number of CPU modules, the I/O assignment setting (module name/point), and the base/power/extension cable setting) cannot be read properly.

Point

The mounting status can be read to the I/O assignment setting by clicking the [Read Mounting Status] button. (RCPUs only)

When I/O assignment has been set, the settings are changed as follows:

- I/O assignment setting: The setting is overwritten with a mounted module. An existing module is deleted.
- Navigation window: A mounted module is newly added. The start I/O number of an existing module is changed to "Unset."

Utilizing system parameters

System parameters of other projects created in GX Works3 and CW Configurator can be utilized.

However, utilizing system parameters of another project is not allowed for a project of an RnPCPU (redundant mode), RnPSFCPU, LHCPU, or FX5CPU.

Operating procedure

1. Double-click "Parameter" ⇒ "System Parameter" in the navigation window.
2. Click the [System Parameter Diversion] button.
3. Read the displayed message, and click the [OK] button.
4. Select a project and click the [Open] button.

■Utilizing system parameters in a project for an R00CPU, an R01CPU, or an R02CPU

To utilize the system parameters of a project for an RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, or R120CPU), change the module type to an R00CPU, R01CPU, or R02CPU and save the project.

By doing so, the system parameters can be utilized from the saved project to a project for an R00CPU, an R01CPU, or an R02CPU.

Setting parameters of control CPU

Set the parameters related to a CPU module (the host CPU for a multiple CPU configuration).

For details on the setting items of the parameters, refer to the following:

| Parameter | Reference |
|-----------------------|--|
| CPU parameter | MELSEC iQ-R CPU Module User's Manual (Application) MELSEC iQ-F FX5 User's Manual (Application) MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application) |
| Memory card parameter | MELSEC iQ-R CPU Module User's Manual (Application) |
| Module parameter | MELSEC iQ-F FX5 User's Manual (Application) |

Setting parameters

Operating procedure

1. Double-click "Parameter" ⇒ "(CPU model name of the project)" ⇒ "CPU Parameter"/"Module Parameter"/"Memory Card Parameter" in the navigation window.
2. Set each item in the parameter editor.
3. Click the [Apply] button or [OK] button.

Point

The setting screen can also be opened by double-clicking the object of a module on the module configuration diagram.

Precautions

For the setting values of the parameters, use characters in the Unicode Basic Multilingual Plane.

If an input language is different from the language set in the regional settings on Windows, some functions may not operate properly. In that case, unify these languages.

If the characters outside the Unicode Basic Multilingual Plane are specified, the program may not operate properly.

- File register setting of the file setting: file name
- Initial value setting of the file setting: name of an initial value file of global labels
- Program setting of the program setting: program name
- FB/FUN file setting of the program setting: FB/FUN file name

Setting parameters of modules

Set parameters of an I/O module, intelligent function module, and network module of the following series supported by GX Works3.

- MELSEC iQ-R
- MELSEC iQ-L
- MELSEC iQ-F
- MELSEC-Q

Adding a module

Add a module in the "Add New Module" screen in advance to set parameters of the module.

Window

1. Select "Parameter" ⇒ "Module Information" in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Add New Module].
Alternatively, right-click it and select [Add New Module] from the shortcut menu.

(1) Text box

Operating procedure

Select each item and click the [OK] button.

Point

By selecting "Yes" for the following option, when adding an intelligent function module to a project, the sample comments for the module are automatically applied to the device comment editor of "Common Device Comment." (Page 420 Reading sample comments)

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Add New Module" ⇒ "Operation Setting" ⇒ "Read Sample Comment"

■ Searching for a module

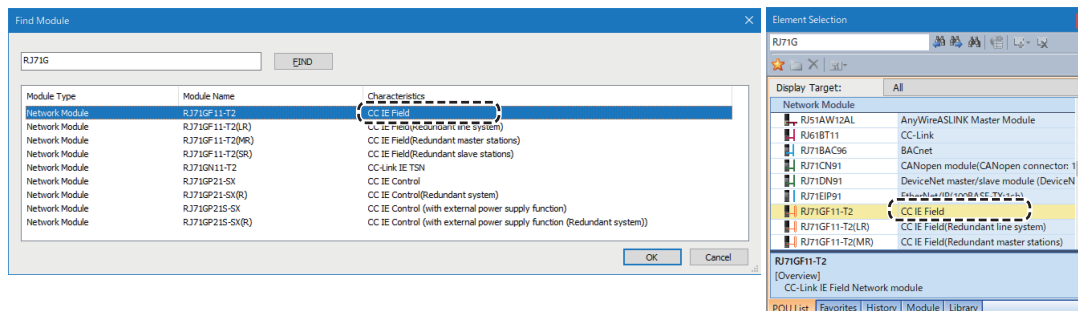
The following shows the procedure to search for a module in the "Add New Module" screen.

Operating procedure

1. Enter any of the following keywords in the text box in the "Add New Module" screen, and click the [FIND] button.
 - Module type
 - Module name
 - Characteristics of a module
2. Select the module in the "Find Module" screen, and click the [OK] button.



In the "Characteristics" column, a character string shown in the [POU List] tab is displayed.




Setting parameters


Set parameters of a module in a parameter editor.

The switch settings and refresh settings of a MELSEC-Q series module can also be set in a parameter editor.

For details on the parameter items, refer to the user's manual of each module.

For details on the MELSEC iQ-F series high speed pulse input/output modules, refer to the following:

 MELSEC iQ-F FX5 User's Manual (Application)

 MELSEC iQ-F FX5 User's Manual (Positioning Control - CPU module built-in, High-speed pulse input/output module)

Operating procedure

1. Double-click "Parameter" ⇒ "Module Information" ⇒ "(module name)" ⇒ "(module parameter)" or "(module extended parameter)" in the navigation window.
2. Set each item in the parameter editor.
3. Click the [Apply] button or [OK] button.

For operations in a parameter editor, refer to the following:

 Page 209 Common operations for parameter settings

Point

For some modules, "(module parameter)" and "(module extended parameter)" may not be displayed in the navigation window.

In that case, double-click "(module name)."

Precautions

The following table shows the modules in which a parameter error occurs by default.

| Series | Module type | Model name |
|----------|---------------------|------------|
| MELSEC-Q | Temperature control | Q64TCRTBWN |
| | | Q64TCRTN |
| | | Q64TCTTBWN |
| | | Q64TCTTN |
| | Interrupt input | QI60 |
| MELSEC-L | Temperature control | L60TCTT4 |
| | | L60TCTT4BW |
| | | L60TCRT4 |
| | | L60TCRT4BW |

Setting network configuration and target devices

Set the network configuration and the connection configuration for a target device in each configuration window.
For details on the settings, refer to each user's manual.

Window

The following shows the operations to display each network configuration window.

| Network type | Operation |
|---|--|
| Ethernet (CPU module) | <ol style="list-style-type: none"> Double-click "Parameter" ⇒ "(CPU model name of the project)" ⇒ "Module Parameter" in the navigation window.*¹ Double-click "Basic Settings" ⇒ "External Device Configuration" ⇒ "<Detailed Setting>" in the parameter editor. |
| Ethernet (Ethernet module) | <ol style="list-style-type: none"> Double-click "Parameter" ⇒ "Module Information" ⇒ "(module name)" ⇒ "(module parameter)" in the navigation window. Double-click "Basic Settings" ⇒ "External Device Configuration" ⇒ "<Detailed Setting>" in the parameter editor. |
| AnyWireASLINK | Double-click "Parameter" ⇒ "Module Information" ⇒ "(module name)" ⇒ "AnyWireASLINK Configuration" in the navigation window. |
| CC-Link IE TSN (master station) ^{*2} | <ol style="list-style-type: none"> Double-click "Parameter" ⇒ "Module Information" ⇒ "(module name)" or "Module Parameter (Network)" in the navigation window. Double-click "Basic Settings" ⇒ "Network Configuration Settings" ⇒ "<Detailed Setting>" in the parameter editor. |
| CC-Link IE Field (master station) ^{*3} | <ol style="list-style-type: none"> Double-click "Parameter" ⇒ "Module Information" ⇒ "(module name)" in the navigation window. Double-click "Basic Settings" ⇒ "Network Configuration Settings" ⇒ "<Detailed Setting>" in the parameter editor. |
| CC-Link IE Field Network Basic ^{*4} | <ol style="list-style-type: none"> Double-click "Parameter" ⇒ "(CPU model name of the project)" ⇒ "Module Parameter" in the navigation window. Double-click "Basic Settings" ⇒ "CC-Link IEF Basic Settings" ⇒ "Network Configuration Settings" ⇒ "<Detailed Setting>" in the parameter editor. |
| CC-Link (master station) | <ol style="list-style-type: none"> Double-click "Parameter" ⇒ "Module Information" ⇒ "(module name)" in the navigation window. Double-click "Basic Settings" ⇒ "Network Configuration Settings" ⇒ "<Detailed Setting>" in the parameter editor. |

*¹ For FX5CPUs, set in the parameter setting ("Module Parameter") for a control CPU.

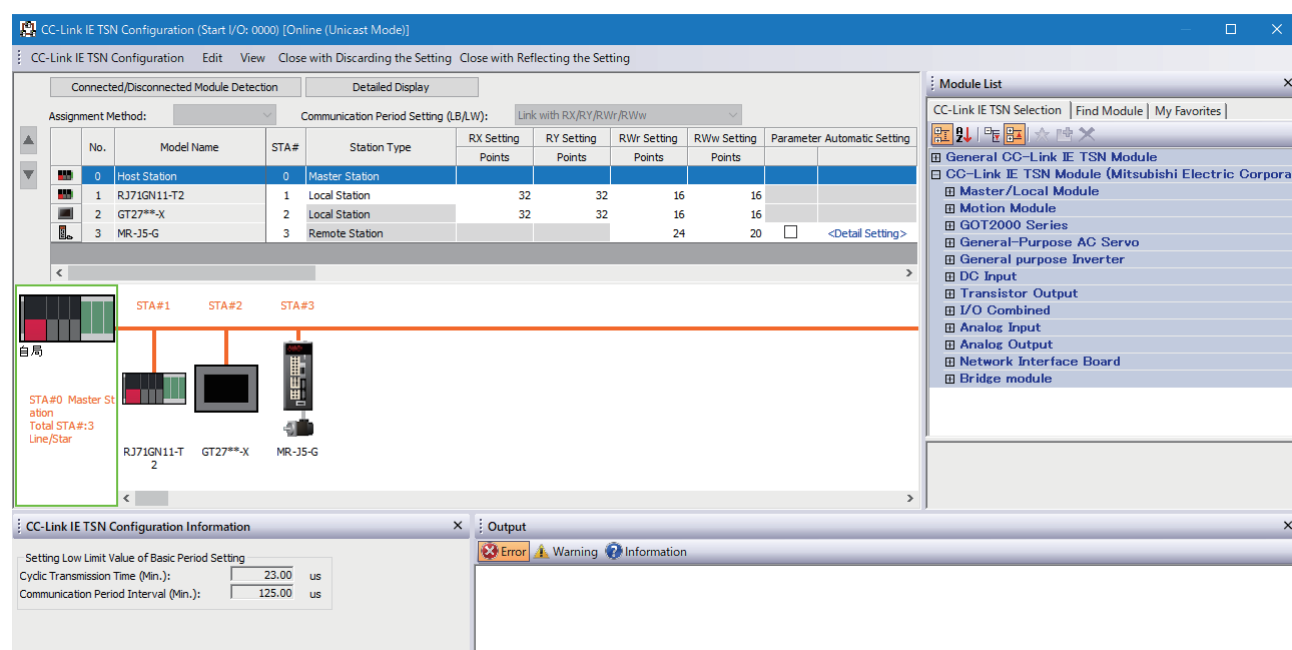
*² RnCPUs, RnENCPUs, RnSFCPU, FX5UCPU, FX5UCCPU, and LHCPU support it.

*³ FX5CPU do not support it.

*⁴ RnCPU, RnENCPU, FX5CPU, LHCPU support it.

Ex.

The following screen is an example for the CC-Link IE TSN configuration setting.



Precautions

■AnyWireASLINK configuration setting

The AnyWireASLINK configuration setting is not written to a programmable controller.




Therefore, the AnyWireASLINK configuration setting returns to the default after reading a module parameter from a programmable controller.

■iQ Sensor Solution functions

The following functions can be used for devices supporting iQSS.

- Automatic detection of connected devices
- Verification of connected devices and configurations
- Reflection of the communication setting
- Sensor parameter read/write
- Sensor/device monitor
- Data backup/restoration
- Useful function: Linkage with dedicated tools (association with properties), command execution to device stations

For details, refer to the following:

| Network | Reference |
|--|---|
| <ul style="list-style-type: none">• AnyWireASLINK (RCPU)• CC-Link• CC-Link-AnyWireASLINK bridge• CC-Link IE Field Network• CC-Link IE Field-AnyWireASLINK bridge• Ethernet (CPU module)• CC-Link IE TSN• CC-Link IE TSN-AnyWireASLINK bridge• CC-Link IE TSN-CC-Link IE Field Network bridge |  iQ Sensor Solution Reference Manual |
| <ul style="list-style-type: none">• AnyWireASLINK (FX5CPU) |  MELSEC iQ-F FX5 User's Manual (AnyWireASLINK) |
| <ul style="list-style-type: none">• CC-Link IE Field Network Basic |  CC-Link IE Field Network Basic Reference Manual |

■Properties

The image diagram can be changed using "Properties" for the particular selected module. Right-click and select [Properties] from the shortcut menu.

Configuration applications, setting files, and manuals can be linked to the modules. Double-click the added module to open the linked application or file.

■Unmatched profile

When displaying a network configuration window, an error message may appear if the following two profiles do not match:


- Profile of a device used in a project
- Profile of a device registered in GX Works3

In this case, contact the manufacturer of the device for the profile that corresponds to "File Version" and "Device Version" displayed in the "Output" window.

An error can be cleared by restarting GX Works3 after registering an obtained profile to GX Works3.

( Page 194 Managing Profiles)

■Module with no profile

For a module with no profile, place a general module instead. Alternatively, register a profile. ( Page 194 Managing Profiles)

Checking refresh devices assigned to a module

Display the refresh devices assigned to a module that uses CC-Link or CC-Link IE TSN in a list.

Set the network configuration for each module in advance. ( Page 217 Setting network configuration and target devices)

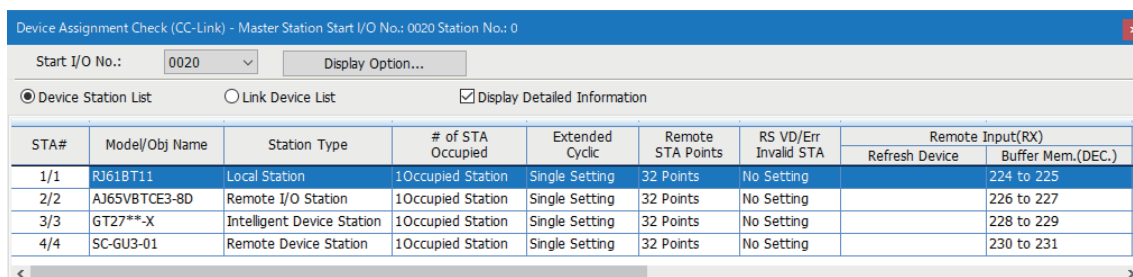
Window

Select [View] ⇒ [Docking Window] ⇒ [Device Assignment Confirmation] ().

Ex.

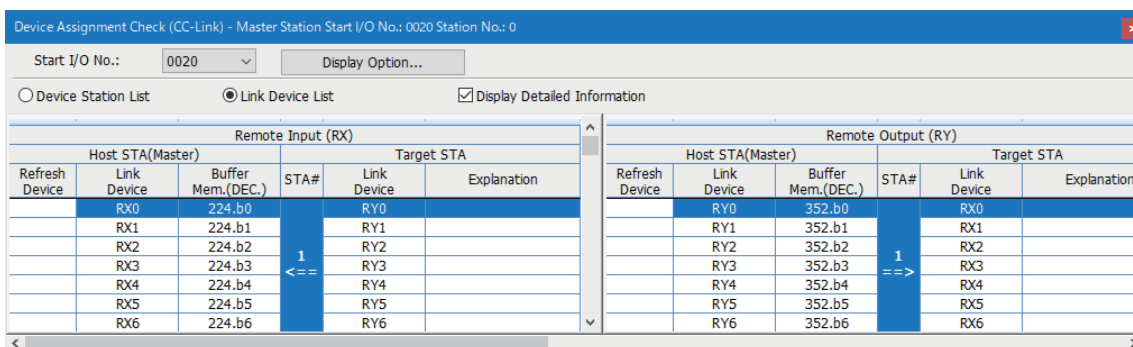
When selecting the start I/O number of the CC-Link system master/local module

■Device station list



| STA# | Model/Obj Name | Station Type | # of STA Occupied | Extended Cyclic | Remote STA Points | RS VD/Err Invalid STA | Remote Input(RX) |
|------|----------------|----------------------------|-------------------|-----------------|-------------------|-----------------------|----------------------------------|
| | | | | | | | Refresh Device Buffer Mem.(DEC.) |
| 1/1 | RJ61BT11 | Local Station | 1Occupied Station | Single Setting | 32 Points | No Setting | 224 to 225 |
| 2/2 | AJ65VBTCE3-8D | Remote I/O Station | 1Occupied Station | Single Setting | 32 Points | No Setting | 226 to 227 |
| 3/3 | GT27*-X | Intelligent Device Station | 1Occupied Station | Single Setting | 32 Points | No Setting | 228 to 229 |
| 4/4 | SC-GU3-01 | Remote Device Station | 1Occupied Station | Single Setting | 32 Points | No Setting | 230 to 231 |

■Link device list



| Remote Input (RX) | | | | | | Remote Output (RY) | | | | | |
|-------------------|-------------|-------------------|------------|-------------|-------------|--------------------|-------------|-------------------|------------|-------------|-------------|
| Host STA(Master) | | | Target STA | | | Host STA(Master) | | | Target STA | | |
| Refresh Device | Link Device | Buffer Mem.(DEC.) | STA# | Link Device | Explanation | Refresh Device | Link Device | Buffer Mem.(DEC.) | STA# | Link Device | Explanation |
| | RX0 | 224.b0 | 1 <== | RY0 | | | RY0 | 352.b0 | 1 ==> | RX0 | |
| | RX1 | 224.b1 | | RY1 | | | RY1 | 352.b1 | | RX1 | |
| | RX2 | 224.b2 | | RY2 | | | RY2 | 352.b2 | | RX2 | |
| | RX3 | 224.b3 | | RY3 | | | RY3 | 352.b3 | | RX3 | |
| | RX4 | 224.b4 | | RY4 | | | RY4 | 352.b4 | | RX4 | |
| | RX5 | 224.b5 | | RY5 | | | RY5 | 352.b5 | | RX5 | |
| | RX6 | 224.b6 | | RY6 | | | RY6 | 352.b6 | | RX6 | |

"Displayed Content for Model Name" and "Buffer Memory Display Format" can be selected by clicking the [Display Option] button.

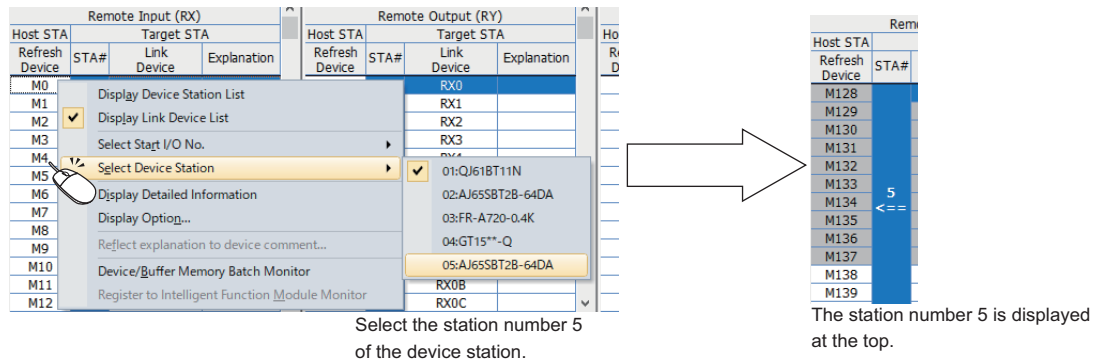
Displayed items

| Item | Description |
|-------------------------------------|--|
| Start I/O No./Mounting Position No. | <ul style="list-style-type: none"> RCPU and LHCPU: "Start I/O No." is shown. Select the start I/O number of the master station or a local station to be displayed on the list. FX5CPU: "Mounting Position No." is shown. Select the mounting position number of the master station or an intelligent device station to be displayed on the list. |
| Device Station List | Displays the information of the device stations and the range of the refresh devices assigned to the own station. Multiple devices are displayed in accordance with the link refresh settings of the Module Parameter. When refresh devices are not assigned, the cells of the refresh device range will be blank. |
| Link Device List | Displays the assignment status of refresh devices on the own station and link devices on the target station. When link devices are not assigned, the cells of the link device range will be blank. The cells of "Explanation" will be blank when profile is not registered. |

Precautions

When selecting the start I/O number of a CC-Link IE TSN Plus master/local module, this function is available only for a device station on the CC-Link IE TSN port.

- Any device station can be displayed on top of the cell by right-clicking on the list of link devices and selecting [Select Device Station] from the shortcut menu.



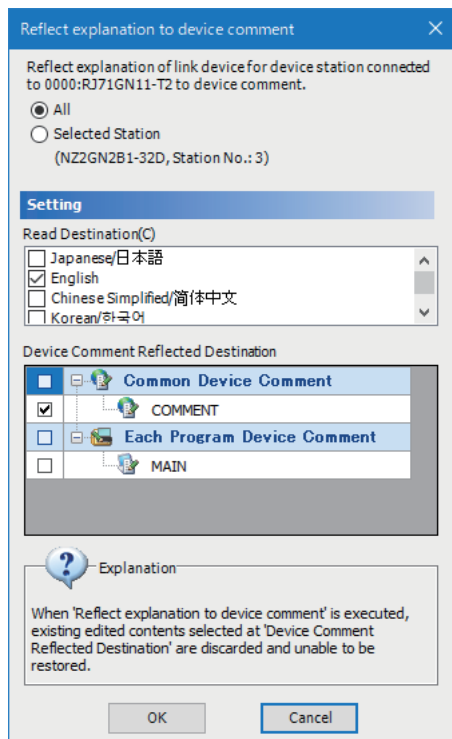
- The "Device/Buffer Memory Batch Monitor" window appears by selecting and right-clicking a refresh device or buffer memory in the link device list, then selecting [Device/Buffer Memory Batch Monitor] from the shortcut menu.

■Applying explanations to device comments

Apply the contents in the "Explanation" column displayed in the link device list of a device station on CC-Link IE TSN to the device comments for each refresh device.

Window

Right-click on the link device list, and select [Reflect explanation to device comment] from the shortcut menu.



Operating procedure

Set each item and click the [OK] button.

Precautions

- The explanation for the first device in the "Link Device" column on the link device list is applied to the device comment for the first device in the "Refresh Device" column.
- If the multiple comment display has been enabled, the contents in the "Explanation" column are applied to device comments in the language selected for "Read Destination" in the "Reflect explanation to device comment" screen.

Checking/changing the number of intelligent function module parameters

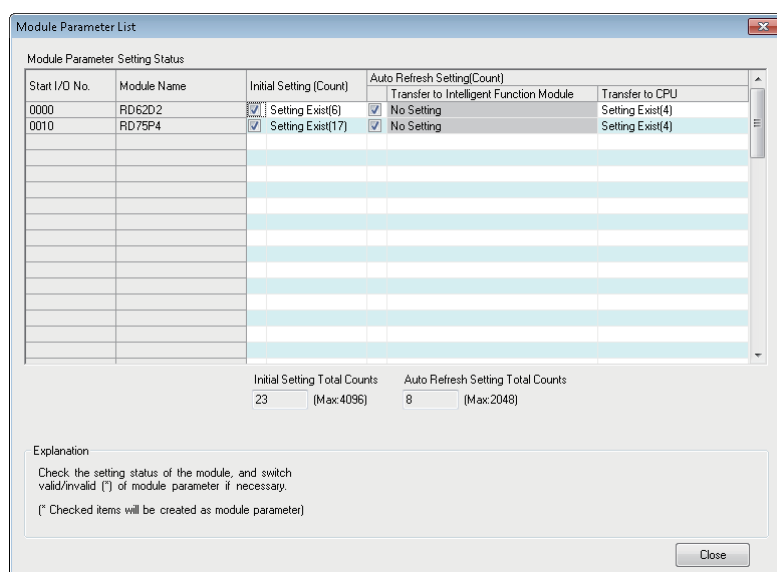
Display the setting information of the start XY addresses, initial settings, and auto refresh settings of intelligent function modules in a list.

After intelligent function module parameters are written to a CPU module, the following operations are performed.

- Initial setting: The parameters of the individual intelligent function module data are set as an initial setting. The data is registered in a CPU module parameters and written to the intelligent function module automatically when the CPU module changed to RUN.
- Auto refresh: For the buffer memory of an intelligent function module set to auto refresh, the data is written to/read from the specified devices automatically when the END instruction is executed on the CPU module.

Window

- Select [Project] ⇒ [Intelligent Function Module] ⇒ [Module Parameter List].
- Select "Parameter" ⇒ "Module Information" in the navigation window, then right-click it and select [Module Parameter List] from the shortcut menu.



■Enabling/disabling parameters

Set whether to enable/disable the initial setting and auto refresh of intelligent function module parameter.

The number of parameters that can be set has limits depending on the intelligent function module to be used. Check the setting information using this function and accordingly enable/disable the parameters so that the number of set parameters is within the allowable range.

For details on the number of the parameter settings, refer to the manuals of relevant intelligent function module.

Operating procedure

Set each item and click the [Close] button.



| Item | | Description |
|-----------------------------------|---|--|
| Initial Setting (Count) | | Unselect the item if it is not set as an intelligent function module parameter. For a module with no initial settings, "-" is displayed. |
| Auto Refresh Setting (Count) | Transfer to Intelligent Function Module | Unselect the item if it is not set as an intelligent function module/CPU module parameter. For a module for which auto refresh is not set, "No Setting" is displayed. |
| | Transfer to CPU | |
| Initial Setting Total Counts | | Displays the number of initial settings set as intelligent function module parameters. |
| Auto Refresh Setting Total Counts | | Displays the number of auto refreshes set as intelligent function module parameters. |

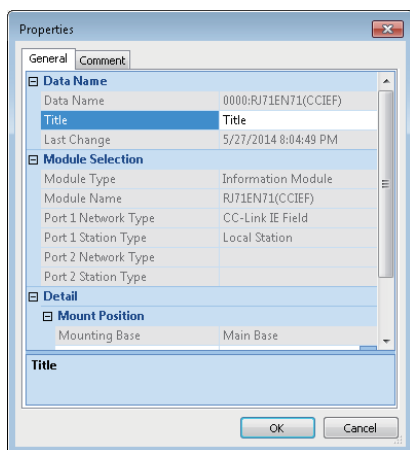
Checking property information

Check the setting information of an intelligent function module.

By this operation, the mounting slot number, start I/O number, and title (up to 32 characters) for RCPU, and the mounting position number and title (up to 32 characters) for FX5CPU can be changed.

Window

1. Select "Parameter" ⇒ "Module Information" ⇒ "(module name)" in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Properties] ().
Alternatively, right-click it and select [Properties] () from the shortcut menu.



Operating procedure

Set each item and click the [OK] button.

Setting link side devices in a batch (CC-Link IE TSN)

Link side devices of either of the following modules can be set in a batch in the "Link Side Device Batch Setting" screen.

- CC-Link IE TSN module
- CC-Link IE TSN Plus master/local module (the CC-Link IE TSN port only)

Window

1. Double-click "Basic Settings" ⇒ "Refresh Setting" ⇒ "<Detailed Setting>" in the parameter editor for either of the following modules:
 - CC-Link IE TSN module
 - CC-Link IE TSN Plus master/local module (the CC-Link IE TSN port only)
2. Right-click on the "Setting Item" column, and select [Link Side Device Batch Setting] from the shortcut menu.

| Register | Device Name | Required Points | Refresh Points | Start | End |
|-------------------------------------|-------------|-----------------|----------------|-------|-------|
| <input checked="" type="checkbox"/> | RX | 64 | 64 | 00000 | 0003F |
| <input checked="" type="checkbox"/> | RY | 64 | 64 | 00000 | 0003F |
| <input checked="" type="checkbox"/> | RWr | 32 | 32 | 00000 | 0001F |
| <input checked="" type="checkbox"/> | RWw | 32 | 32 | 00000 | 0001F |
| <input type="checkbox"/> | LB | | 16 | 00000 | 0000F |
| <input type="checkbox"/> | LW | | 1 | 00000 | 00000 |

Explanation

- Edited refresh setting other than SB/SW is deleted.
- Required points: Minimum number of points to refresh all stations registered in Network Configuration Settings.

OK Cancel

Operating procedure

Set each item and click the [OK] button.

Precautions

Adding another device station after setting refresh points may cause a shortage of the points.

In that case, the refresh points need to be set again; therefore, setting larger numbers in advance is recommended.

Auto-refresh batch setting/points batch setting (EtherNet/IP)

The setting values of module extended parameters of a CC-Link IE TSN Plus master/local module can be applied to the refresh setting.

Operating procedure

1. Double-click "Basic Settings" ⇒ "Refresh Setting" ⇒ "<Detailed Setting>" in the parameter editor for a CC-Link IE TSN Plus master/local module (the EtherNet/IP port):
2. Select "Device" from the pull-down list of "Target."
3. Right-click on the "Setting Item" column, and select [Auto-refresh Batch Setting]/[Points Batch Setting] from the shortcut menu.

Precautions

To use this function, EtherNet/IP Configuration tool Version 1.04E or later is required to be installed.

For details on the EtherNet/IP Configuration tool, refer to the following:

📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual

Module-specific menus for editing parameters

Depending on the setting items of each module, the input format and device assignment method can be selected from one of the following menus.

- [Edit] ⇒ [IP Address Input Format] ⇒ [Decimal]/[Hexadecimal]
- [Edit] ⇒ [Device Assignment Method] ⇒ [Start/End]/[Points/Start]
- [Edit] ⇒ [Word Device Setting Value Input Format] ⇒ [Decimal]/[Hexadecimal]

Registering a simple device communication library

A simple device communication library describes the information on a communication destination and protocol to use the simple device communication function.

By registering a simple device communication library in GX Works3, a device that can communicate with a module can be added without updating the module firmware and GX Works3.

An added communication destination can be set in "Simple Device Communication Setting" of the module parameter for a module that supports the simple device communication function.

For details on the simple device communication function and simple device communication library, refer to the following:

📖 MELSEC iQ-R Ethernet User's Manual (Application)

The following shows the procedure to register a simple device communication library.

Make sure to log on to a personal computer as a user with the administrator authority and close the project in advance.

Operating procedure

1. Select [Tool] ⇒ [Register Simple Device Communication Library].
2. Select a simple device communication library file (*.sdcl) in the displayed screen, and click the [Open] button. (Multiple selections allowed.)

Parameter interaction with MELSOFT Navigator

By using the parameter interaction function of MELSOFT Navigator, the parameter consistency can be ensured between MELSOFT Navigator and GX Works3.

This function is operated in MELSOFT Navigator. For details, refer to MELSOFT Navigator Help.

4.3 Other Settings of Intelligent Function Modules

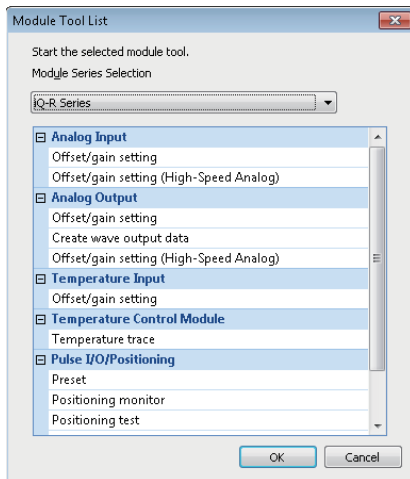
The settings except for the parameter setting of an intelligent function module can be configured with a module tool or dedicated tool.

Setting with a module tool/drive tool

Displaying the module tool list

Window

Select [Tool] ⇒ [Module Tool List].

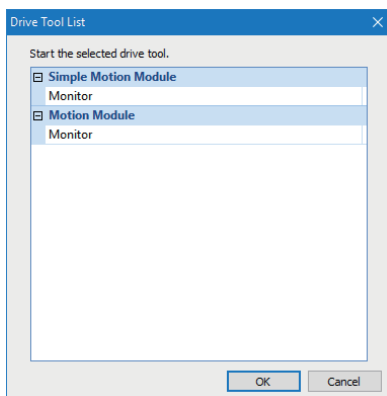


For the functions of each module tool, refer to the user's manual of a target module.

Displaying the drive tool list

Window

Select [Tool] ⇒ [Drive Tool List].



For the functions of the drive tool, refer to the user's manual of a target module.

Simple motion module setting function

This function is used to set parameters and positioning data of the following modules:

- Simple motion module
- CC-Link IE TSN compatible motion module (simple motion mode)

For details on the operation methods and setting items, refer to Help for the simple motion module setting function.

The following shows the operating procedure to start this function.

Operating procedure

1. Select "Parameter" ⇒ "Module Information" in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Add New Module].
3. Select "Simple Motion" or "Motion Module" from the pull-down list of "Module Type" in the "Add New Module" screen.
4. Set each item and click the [OK] button.

If selecting "Motion Module" in step 3, set the module name to which '(S)' is added for "Module Name." (Example: FX5-40SSC-G(S))

5. Double-click the created "Simple Motion Module Setting (Module Extended Parameter)" or "Module Extended Parameter."

Point

By saving a GX Works3 project, contents set with this function are saved.

Motion control setting function

This function is used to set parameters of a motion module.

To set parameters of a CC-Link IE TSN compatible motion module (simple motion mode), use the simple motion module setting function. (☞ Page 227 Simple motion module setting function)

FX5CPUs do not support it.

For details on the operation methods and setting items, refer to Help for the function.

The following shows the operating procedure to start this function.

Operating procedure


1. Select "Parameter" ⇒ "Module Information" in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Add New Module].
3. Select "Motion Module" from the pull-down list of "Module Type" in the "Add New Module" screen.
4. Set each item and click the [OK] button.
5. Double-click the created "Module Extended Parameter."


Point

By saving a GX Works3 project, contents set with this function are saved.

4.4 Predefined Protocol Support Function

Start the Predefined Protocol Support Function from GX Works3, and set the protocol and read/write data from/to a module.
For details, refer to the following:

 MELSEC iQ-R Serial Communication Module User's Manual(Application)

 MELSEC iQ-R Ethernet User's Manual (Application)

 MELSEC iQ-F FX5 User's Manual (Serial Communication)

 MELSEC iQ-F FX5 User's Manual (Ethernet Communication)

For RnPCPUs (redundant mode), this function can be used when the modules are in the separate mode and "Not Specified" is selected for "Specify Redundant CPU."

For RnPSFCPUs, this function can be used only when "Not Specified" is selected for "Specify Redundant CPU."



The files saved in GX Works2 can be read using the Predefined Protocol Support Function of GX Works3.

Start and End

Start and end the predefined protocol support function.

Start

Operating procedure

1. Select GX Works3 menu [Tool] ⇒ [Predefined Protocol Support Function].
2. Set each item in the "Predefined Protocol Support Function" screen and click the [OK] button.

End

Operating procedure

Select [File] ⇒ [Exit] in the protocol setting screen.

4.5 Circuit Trace Function

Trace the send/receive data and communication control signal between C24 and a target device.

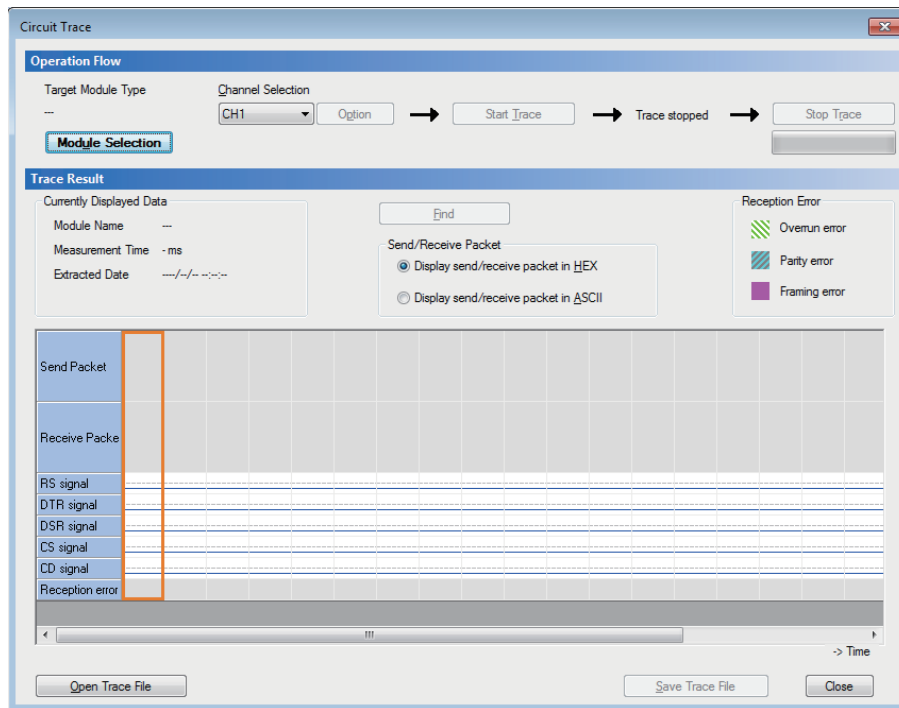
For details, refer to the following:

📖 MELSEC iQ-R Serial Communication Module User's Manual(Application)

FX5CPUs do not support this function.

Window

Select [Tool] ⇒ [Circuit Trace].



4.6 Change Module

This function changes the module type set in a GX Works3 project.

The module type, module name, and station type of a module set in a project can be changed to data for another module.

Module

The module types, module names, and station types that can be changed for each of the following modules are as follows:

■Another CPU module

| Module type | Module name |
|-------------|---|
| PLC CPU | R00CPU, R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU |
| Process CPU | R08PCPU, R16PCPU, R32PCPU, R120PCPU |
| Safety CPU | R08SFCPU, R16SFCPU, R32SFCPU, R120SFCPU |
| Motion CPU | R16MTCPU, R32MTCPU, R64MTCPU |
| NCCPU | R16NCCPU |
| Robot CPU | R16RTCPU |

■CC-Link IE built-in Ethernet module

| Module type | Module name | Station type |
|--------------------|--------------------|--|
| Information module | RJ71EN71 (E+CCIEC) | Control station, normal station, extended mode (control station), extended mode (normal station) |
| | RJ71EN71 (E+CCIEF) | Master station, local station, sub-master station |
| | RJ71EN71 (E+E) | — |

■CPU extension module

| Module type | Module name | Station type |
|---------------|-------------------|--|
| CPU extension | _RJ71EN71 (E+IEC) | Control station, normal station, extended mode (control station), extended mode (normal station) |
| | _RJ71EN71 (E+IEF) | Master station, local station, sub-master station |

■Simple motion module/motion module (simple motion mode)

| Module type | Series | Module name |
|--|----------------------|---|
| Simple motion | iQ-R ^{*1,2} | RD77MS2, RD77MS4, RD77MS8, RD77MS16, RD77GF4, RD77GF8, RD77GF16, RD77GF32 |
| | iQ-F ^{*1} | FX5-40SSC-S, FX5-80SSC-S |
| Motion module (simple motion mode) ^{*3} | iQ-R ^{*1} | RD78G4(S), RD78G8(S), RD78G16(S) |
| | iQ-F ^{*1} | FX5-40SSC-G(S), FX5-80SSC-G(S) |
| | iQ-L ^{*1} | LD78G4(S), LD78G16(S) |
| | L ^{*4} | LD77MS2, LD77MS4, LD77MS16 |

*1 Cannot be changed to a module of a different series.

*2 Cannot be changed from an RD77GF4, RD77GF8, RD77GF16, and RD77GF32 to an RD77MS2, RD77MS4, RD77MS8, and RD77MS16.

*3 Cannot be changed to a simple motion module.

*4 Can be changed to LD77MS2, LD77MS4, LD77MS16, LD78G4(S), or LD78G16(S) only.

■CC-Link IE TSN compatible motion module

| Module type | Module name |
|---------------|---|
| Motion Module | RD78G4 ^{*1} , RD78G8 ^{*1} , RD78G16 ^{*1} , RD78G32 ^{*1} , RD78G64 ^{*1} , RD78GHV ^{*2} , RD78GHW ^{*2} |

*1 Cannot be changed to an RD78GHV and RD78GHW.



*2 Cannot be changed to an RD78G4, RD78G8, RD78G16, RD78G32, and RD78G64.

Operating procedure

1. Select "Parameter" ⇒ "Module Information" ⇒ "(module name)" in the navigation window.
2. Right-click the selected module, and select [Change Module] from the shortcut menu.
A change module screen appears.
3. Set each item in the change module screen, and click the [OK] button.

Precautions

■When changing a CC-Link IE built-in Ethernet module or CPU extension module

- A module controlled by another CPU module cannot be changed.
- After changing a module,  (required settings unchecked) appears in the navigation window.
Select [Tool] ⇒ [Check Parameter] to check parameters. ( Page 210 Checking parameters)

Data to be changed

The following tables show the data that is changed by changing a module.

For the changes on simple motion modules and motion modules, refer to Help for the simple motion module setting function and for the motion control setting function respectively.

■Another CPU module

| Item | | Description |
|---|------------------------|---|
| "Parameter" ⇔ "Module Information" in the navigation window | | The settings are updated according to the changed module. |
| Module configuration diagram | | |
| System parameter | I/O assignment setting | |
| | Multiple CPU setting | The settings are applied. |
| Properties | Title | |
| | Comment | |
| | Others | The settings are updated according to the changed module. |

■CC-Link IE built-in Ethernet module

| Item | | Description |
|---|---------------------------------|---|
| "Parameter" ⇒ "Module Information" in the navigation window | | The settings are updated according to the changed module. • Module parameter (port 1): Applied. • Module parameter (port 2): Returned to the default. |
| Module configuration diagram | | The settings are updated according to the changed module. |
| Module label | | Deleted. Besides, the data types and classes of global labels assigned to module labels are also deleted. Registered as a global label depending on the contents of the following settings. • [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Module Label" ⇒ "Operational Setting" ⇒ "Use Module Label" • [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Module Label" ⇒ "Message" ⇒ "Show the confirmation message in adding module" |
| Module FB | | The module FB definition used before the module type change is deleted from the navigation window. Added to the element selection window according to the changed module. |
| System parameter | I/O assignment setting | The settings are updated according to the changed module. |
| | Multiple CPU setting | The settings are applied. |
| | Redundant module group setting | Deleted. |
| Module Parameter | Interlink transmission settings | Returned to the default. |
| Properties | Title | The settings are applied. |
| | Comment | |
| | Others | The settings are updated according to the changed module. |

■CPU extension module

| Item | | Description |
|---|---------------------------------|---|
| "Parameter" ⇒ "Module Information" in the navigation window | | The settings are updated according to the changed module. <ul style="list-style-type: none"> Module parameter (port 1): Applied. Module parameter (port 2): Returned to the default. |
| Module configuration diagram | | The settings are updated according to the changed module. |
| Module label | | Deleted. Besides, the data types and classes of global labels assigned to module labels are also deleted. Registered as a global label depending on the contents of the following settings. <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Module Label" ⇒ "Operational Setting" ⇒ "Use Module Label" [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Module Label" ⇒ "Message" ⇒ "Show the confirmation message in adding module" |
| Module FB | | The module FB definition used before the module type change is deleted from the navigation window. Added to the element selection window according to the changed module. |
| System parameter | I/O assignment setting | The settings are updated according to the changed module. |
| | Multiple CPU setting | The settings are applied. |
| Module parameter | Interlink transmission settings | Returned to the default. |
| Properties | Title | The settings are applied. |
| | Comment | |
| | Others | The settings are updated according to the changed module. |

5 REGISTERING LABELS

This chapter explains the overviews and registration methods of labels.

5.1 Labels

There are four types of label; labels registered on label editors (global label and local label), a module label which is prepared as the dedicated label for each module (global label), and a system label which is interacted with MELSOFT Navigator. Global labels can be registered as system labels.

| Type | Description | Creation method | Number of creatable labels | Reference |
|--------------|---|--|--|------------------------------------|
| Local label | Labels that can be used in each program | Create them on a local label editor. | • 5120 in a program file (maximum) | Page 235 Registering Labels |
| Global label | Labels that can be used in all programs in a project. There are two types of global label; global labels that can be used either in standard programs or in safety programs, and standard/safety shared labels that can be used in both programs. | Create them on a global label editor. | • 20480 in a file (maximum) • 16384000 in a project (maximum) | |
| System label | Labels that can be shared among iQ Works supported products. These labels are controlled by MELSOFT Navigator. | Register standard global labels as system labels on a global label editor. | | Page 265 Registering System Labels |
| Module label | Labels in which the I/O signals and buffer memory of a module to be used are already defined. By using module labels, an easy-to-reuse program can be created without considering the internal address of the module. These labels can be used in standard programs only. | Add module labels when adding the module information. These labels are created as standard global labels. | | Page 258 Registering Module Labels |

- Numbers of characters of labels and label comments

| Type | Number of characters of a label | Number of characters of a label comment |
|--------------|---------------------------------|---|
| Local label | 256 (maximum) | 1024 (maximum) |
| Global label | | |
| System label | | |
| Module label | Not changeable | Not available |

For details on the label types, classes, and data types, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Auto refresh and direct access for module labels

There are two types of module labels for each purpose: auto refresh and direct access. For direct access, '_D' is added to a label name.

The difference between auto refresh and direct access is as follows.

| Type | Description | Access timing |
|---------------|---|---|
| Auto refresh | The value written to/read from a module label is applied to a module in a batch when auto refresh is performed. By using the auto refresh, the execution time of a program can be shortened. To use the auto refresh, select "Module Label" in "Target" under the refresh setting of the module parameter. | When auto refresh is performed |
| Direct access | The value written to/read from a module label is immediately applied to a module. Compared with the auto refresh, the execution time of a program will be extended; however, responsiveness will be increased. To use the direct access, select the item other than "Module Label" in "Target" under the refresh setting of the module parameter. When "Module Label" is selected in "Refresh," values of module labels are overwritten by a refresh when an END processing is executed or a program in which a refresh timing is specified is executed. | When reading from/writing to a module label |

5.2 Registering Labels

This section explains the registration methods of global labels and local labels.
A global label can be created maximum 20480 in a file and maximum 16384000 in a project. A local label can be registered maximum 5120 in a program file.

Configuration of a label editor

This section explains the configuration of a label editor.
The editor to be displayed will differ depending on the label types.

Point

The display format and details of operation settings for each function can be set by setting the following option.
[Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common"

Window

Global label

Select "Label" ⇒ "Global Label" ⇒ "(global label)" in the navigation window.

Local label

Select "Program" ⇒ "(execution type)" ⇒ "(program file)" ⇒ "(program block)" ⇒ "Local Label" in the navigation window.

Toolbar



Label editor (global label editor)

Global [Global Label Setting]

<Filter>

Easy Display

Display Setting

Check

| | Label Name | Data Type | Class | Assign (Device/Label) | Initial Value | Constant | English(Display Target) |
|---|------------|--|------------|-----------------------|---------------|----------|-------------------------|
| 1 | bLabel1 | Bit | VAR_GLOBAL | | | | |
| 2 | udLabel2 | Double Word [Unsigned]/Bit String [32-bit] | VAR_GLOBAL | | | | |
| 3 | wLabel3 | Word [Signed] | VAR_GLOBAL | | | | |
| 4 | CTD_1 | CTD | VAR_GLOBAL | | | | |
| 5 | stLabel5 | STRUCT1(0..1) | VAR_GLOBAL | Detailed Setting | | | |
| 6 | uLabel6 | Word [Unsigned]/Bit String [16-bit](0..2) | VAR_GLOBAL | | | | Comment_1 |

Extended Display: Show Always

stLabel5

[0]

[1]

stLabel5(STRUCT1(0..1))

| Label Name | Data Type | Device |
|------------|---------------|--------|
| Element1 | Bit | M0 |
| Element2 | Word [Signed] | D0 |

Word/bit device can be set at the start of structure array.

Word Device Setting

Start Word DeviceD0Word Device Offset(N)Word Device Use Amount of Structured Data Type *11*1: Offset Value which Makes No Repetition of Device to Assign

Bit Device Setting

Use word device in bit type label of structure by iStart Bit DeviceM0Bit Device Offset(M)Bit Device Use Amount of Structured Data Type *21*2: Offset Value which Makes No Repetition of Device

System label is reserved to be registered.

System label is reserved to be released.

The system label is already registered to the system label database.

Reservation to Register System Label

Reservation to Release System Label

Import System Label

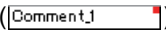



Reflect to System Label Database


Not Reflected: 0
Total: 0

5 REGISTERING LABELS
5.2 Registering Labels


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- The items in the label list (1), extension display area (2), and system label area (3) can be displayed or hidden in the "Display Setting" screen that appears by clicking the [Display Setting] button or in the following options:
 - [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Detailed Display Setting"
 - [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Extended Display Setting" ⇒ "Extended Display Area"
 - [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Extended Display Setting" ⇒ "System Label Setting Display Area"

The settings changed in the "Options" screen are applied to all label editors.
- Click the [Check] button to check errors before converting programs.
- When the data type is structure or function block, the hierarchy of labels is displayed in the extension display area.
- If a label comment is set for an array element or bit-specified label, a red square is displayed at the upper right of the cell () in the comment column.
The label comment for the array element or bit-specified label can be checked in the "Label Comment" window. ( Page 253 Setting a label comment)
- The "Label Comment" window appears by selecting a cell then performing either of the following operations:
 - Right-click it and select [Open Label Comment Setting] from the shortcut menu.
 - Press the  +  keys.

However, these operations are not available when selecting a blank row or a cell in the extension display area.
- Font color, background color, and font can be changed.
 Page 82 Checking and Changing Colors and Fonts

Precautions

In a label editor, perform any other operations after fixing current changes by pressing the  key.

Editing a row

■Adding a row

When selecting [New Declaration (After)], a row is inserted right under the selected row. In the new row, the label in the selected row is copied with a value appended at the end of the label name.

If a value is already appended after the label name, the data is copied with an incremented value.

When devices are set for global labels, the data is copied with an incremented device number.

For adding blank rows or setting increment regulation (decimal/hexadecimal), set the following option.

- [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Editor Setting"

Operating procedure

Select [Edit] ⇒ [New Declaration (Before)]()/[New Declaration (After)]().

If a label comment is set for an array element or bit-specified label of the label in a selected row, the label comment is also copied.

■Deleting rows (deleting labels)

Operating procedure

Select [Edit] ⇒ [Delete Row]().

■Deleting a blank row



A blank row automatically is deleted and the following row moves upward on a label editor.

Operating procedure

Select [Edit] ⇒ [Delete Blank Rows]. ()

■Sorting labels

Labels can be sorted by clicking a title name of label editor.

For ascending order,  is displayed, and as for descending order,  is displayed in the title name.

■Filtering display

- A wild card (such as '*' and '?') is not applied as a filtering condition. A character string including the wild card is displayed.
- When filtering columns by selecting "Access from External Device," specify '1' after selecting "Access from External Device." As for it is not selected, specify '0.'

Entering information

Label name

Set a name with avoiding the following conditions:

- Label name including a space
- Label name starting with a number
- Same label name as one for a device

For the characters that cannot be used for a label name, refer to the following:

 Page 927 Unusable character strings for a label name

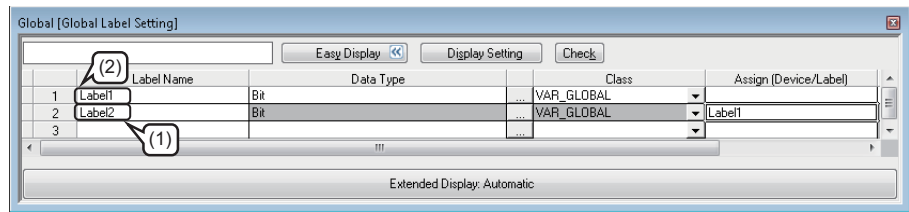
Precautions

For label names, constants, and initial device values, use characters in the Unicode Basic Multilingual Plane.
If an input language is different from the language set in the regional settings on Windows, some functions may not operate properly. In that case, unify these languages.
The label names and constants that specifies the characters other than the Unicode Basic Multilingual Plane cannot be used in programs.
A program including an initial value using the characters outside the Unicode Basic Multilingual Plane may not operate properly.

Alias

By entering an existing label name in the "Assign (Device/Label)" column of a label editor, it can be set as an alternative label name of the existing label.
A label to which an existing label is assigned is referred to as 'alias.'
An existing label that is assigned to an alias is referred to as 'alias source.'
The following information of an alias source will be succeeded: data types, classes, initial values, and constants.
For an alias, a label in the same category (standard, safety, and standard/safety shared) as an alias source can only be set.

Ex.



- (1): Alias
(2): Alias source

Precautions

- For an alias, do not assign an instance of a function block or module FB.
- Enter the same character in the "Assign (Device/Label)" column of an alias as the one which was entered in the "Label Name" column of the alias source.
- For an alias, a structure member and a label in a function block can not be assigned.
- The following error occurs at conversion when a structure member or a label used in a function block is entered in the "Assign (Device/Label)" column of an alias and the alias is used in a program editor.
Content: An invalid device or an invalid constant is being used.
Error code: 0x12011067
- When using an alias in a project in which 20000 or more labels are included, the operability of a label editor may be deteriorated.
In that case, assign the same device to two labels instead of alias, or set another name of a label as a label comment.

Ex.

When using 'Label2' as another name of 'Label1':

- (1) Assign 'M120' to 'Label1' and 'Label2.'
- (2) Set the comment of 'Label1' to 'Label2,' and display the comment in a program editor.

| Label Name | Data Type | Class | Assign (Device/Label) |
|------------|-----------|------------|-----------------------|
| Label1 | Bit | VAR_GLOBAL | |
| Label2 | Bit | VAR_GLOBAL | Label1 |

| Label Name | Data Type | Class | Assign (Device/Label) | Comment |
|------------|-----------|------------|-----------------------|---------|
| Label1 | Bit | VAR_GLOBAL | M120 | |
| Label2 | Bit | VAR_GLOBAL | M120 | Label2 |

(1)

(2)

- When setting an alias, set it so as not to cause a circular reference.
For example, make sure a circular reference will not occur before copying and pasting a global label in the same project or from another project.
- The following shows an example that a circular reference occurs.

Ex.

If 'Label3' is assigned to 'Label1' while the alias (Label2) of 'Label1' and the one (Label3) of 'Label2' have been set, an error occurs since the assignment causes a circular reference.

| Label Name | Data Type | Class | Assign (Device/Label) |
|------------|-----------|------------|-----------------------|
| Label1 | Bit | VAR_GLOBAL | |
| Label2 | Bit | VAR_GLOBAL | Label1 |
| Label3 | Bit | VAR_GLOBAL | Label2 |

| Label Name | Data Type | Class | Assign (Device/Label) |
|------------|-----------|------------|-----------------------|
| Label1 | Bit | VAR_GLOBAL | Label3 |
| Label2 | Bit | VAR_GLOBAL | Label1 |
| Label3 | Bit | VAR_GLOBAL | Label2 |

■ Automatic naming rule

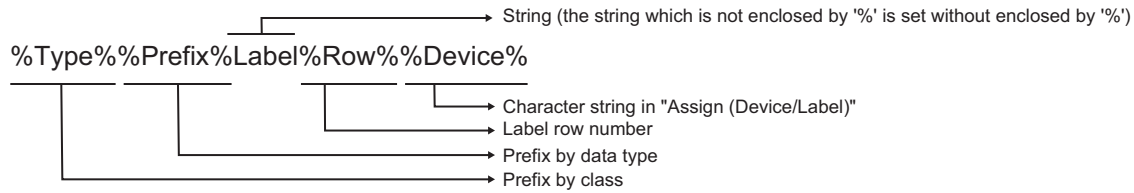
By setting the data type and the class when the label name is blank, a label name will be set automatically.

Set the automatic naming rules in the following option setting.

- [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Editor Setting"

The automatic naming rules are as follows.

- Defined characters



*The character other than the defined one enclosed by '%' will be blank.

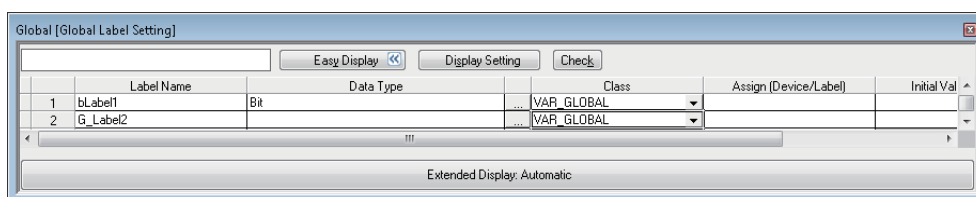
The prefixes for each data type are as follows.

| Data type | Prefix |
|--|--------|
| Bit | b |
| Word [Unsigned]/Bit String [16-bit] | u |
| Double Word [Unsigned]/Bit String [32-bit] | ud |
| Word [Signed] | w |
| Double Word [Signed] | d |
| FLOAT [Single Precision] | e |
| FLOAT [Double Precision] | le |
| Time | tm |
| String | s |
| String [Unicode] | ws |
| Pointer | pd |
| Timer | td |
| Counter | cd |
| Long Counter | lcd |
| Retentive Timer | std |
| Long Retentive Timer | lstd |
| Long Timer | ltd |
| Structure | st |
| FB | fb |

The prefixes that are added depending on the selected class are as follows.

| Class | Prefix |
|---------------------|------------|
| VAR_GLOBAL | G_ |
| VAR_GLOBAL_RETAIN | GR_ |
| VAR_GLOBAL_CONSTANT | GC_ |
| VAR | Not added. |
| VAR_RETAIN | r_ |
| VAR_CONSTANT | c_ |
| VAR_INPUT | i_ |
| VAR_OUTPUT | o_ |
| VAR_IN_OUT | io_ |
| VAR_OUTPUT_RETAIN | or_ |
| VAR_PUBLIC | pb_ |
| VAR_PUBLIC_RETAIN | pbr_ |

■Setting example



- When "Bit" is selected in the "Data Type" column: bLabel1
Prefix 'b' that indicates the bit type + character string 'Label' + label row number '1'
- When "VAR_GLOBAL" is selected in the "Class" column: G_Label2
Prefix 'G_' that indicates the class + character string 'Label' + label row number '2'
- When "D0" is specified in the "Assign (Device/Label)" column: Label3
Character string 'Label' + label row number '3'

■Automatic synchronization

When a label name or alias name is changed on a label editor, the label name or alias name used on program editors such as ST editor, FBD/LD editor, and SFC editor will also be replaced automatically.

- Select "Yes" for "Track label name automatically in program editor" from [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Operational Setting"

The labels are distinguished between global labels and local labels in the automatic synchronization. (Page 271 Entering global labels/local labels)

However, in either of the following cases, the label name or alias name is not replaced:

- A character string that cannot be used for a label name is included in the label name or alias name.
- The same label name or alias name exists in a label editor.

(If a global label name is changed, the label is checked if the same label name or alias name exists in any of the global label settings.)

The programs in which the replaced label is used will be in the unconverted state.

If labels name or alias name is changed, check if the change affects control programs using the cross reference function.

■Label synchronization

The contents edited on a global label editor are immediately applied on a ladder editor by setting the following option. When labels undefined on the ladder editor are newly added on the label editor, they will be in the defined state.

- Set "Synchronize" for "Operation on Editing Label Editor" in [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Label Synchronization" ⇒ "Operational Setting."


Local labels always synchronize with the data on a label editor regardless of the option setting.

■Duplicating a structure type global label

Structure type global labels can be duplicated including the setting of a device assigned to a global label.

The following shows the procedure to duplicate a structure type global label.

Operating procedure

1. Select a structure type global label on a global label editor.
2. Select [Edit] ⇒ [Duplicate Structured Data Type Label] ()
3. Select a global label and line number of the duplication destination in the "Duplicate Structured Data Type Label" screen, and click the [OK] button.

Precautions

Only standard global labels and safety global labels can be duplicated.

The following labels cannot be duplicated:

- Global labels to which a device is not assigned
- Global labels whose data type is other than structure
- Standard/safety shared labels
- Module labels
- Tag FB instances
- Read-only labels
- Global labels to which a structure type global label is assigned (alias)

Data type

A data type can be selected in the "Data Type Selection" screen displayed by clicking [...] in the "Data Type" column on each label editor as well as the direct input.

There are three kinds of data types: "Simple Types," "Structured Data Type," and "Function Block." A data type that can be selected for each kind differs.

An array can be set for the selected data type.

For details on the data types, structures, and arrays, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

■ Simple types

Data types that can be set for each label are as follows.

○: Available, ×: Not available

| Data type | Standard label | Safety label | Standard/safety shared label |
|--|----------------|--------------|------------------------------|
| Bit | ○ | ○ | ○ |
| Word [Unsigned]/Bit String [16-bit] | ○ | ○ | ○ |
| Double Word [Unsigned]/Bit String [32-bit] | ○ | ○ | ○ |
| Word [Signed] | ○ | ○ | ○ |
| Double Word [Signed] | ○ | ○ | ○ |
| FLOAT [Single Precision] | ○ | × | × |
| FLOAT [Double Precision] | ○ | × | × |
| Time | ○ | ○ | ○ |
| String | ○ | × | × |
| String [Unicode] | ○ | × | × |
| Pointer | ○ | × | × |
| Timer | ○ | ○ | ○ |
| Counter | ○ | ○ | ○ |
| Long Counter | ○ | × | × |
| Retentive Timer | ○ | ○ | ○ |
| Long Retentive Timer | ○ | × | × |
| Long Timer | ○ | × | × |



The data length for the String or String [Unicode] type can be changed by editing the value in "()" directly.

| | Label Name | Data Type | Class |
|---|------------|------------|-------|
| 1 | L_string1 | String(32) | VAR |
| 2 | L_string2 | String(16) | VAR |
| 3 | | | |

↑
Change these values directly.

The initial value of the data length for the String or String [Unicode] type can be set in the option setting.

- [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Data Type Setting"

When "()" is deleted from the name for the String or String [Unicode] type, the data length in the option described above is regarded as being set.

■ Structure

When specifying a structure data as a data type, creating a definition of the structure is required in advance. (Page 252 Creating a defined structure)

After creating a defined structure, specify the structure name in "Data Type."

■Function block

When specifying a function block data as a data type, creating a function block is required in advance.

For details, refer to the following:

👉 Page 505 Creating a Function Block

After creating a function block, specify the function block name in "Data Type."

■Setting arrays for data type

An array can be set for the data type by selecting the checkbox of "ARRAY."

The following shows setting examples of an array.

Ex.

One-dimensional array with eight elements

Enter '8' in "Element (1 dimension)."

| | | | | | | | | |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| bLabel1 | [0] | [1] | [2] | [3] | [4] | [5] | [6] | [7] |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|

Array Element

☒ ARRAY

| | |
|------------------------|---|
| Element (1 dimension) | 8 |
| Element (2 dimensions) | 0 |
| Element (3 dimensions) | 0 |

Ex.

Two-dimensional array with 4×8 elements

Enter values as shown below:

- Element (1 dimension): 4
- Element (2 dimensions): 8

| | | | | | | | | |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| bLabel1 | [0,0] | [0,1] | [0,2] | [0,3] | [0,4] | [0,5] | [0,6] | [0,7] |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | [3,0] | [3,1] | [3,2] | [3,3] | [3,4] | [3,5] | [3,6] | [3,7] |

Array Element

☒ ARRAY

| | |
|------------------------|---|
| Element (1 dimension) | 4 |
| Element (2 dimensions) | 8 |
| Element (3 dimensions) | 0 |

Ex.

Three-dimensional array with $3 \times 4 \times 8$ elements

Enter values as shown below:

- Element (1 dimension): 3
- Element (2 dimensions): 4
- Element (3 dimensions): 8

A 3D diagram of a tensor with dimensions 3x8x2. The top face is labeled "bLabel1" and contains elements [2,0,0] to [2,0,7]. The front face contains elements [0,0,0] to [0,0,7]. The bottom face contains elements [0,3,0] to [0,3,7]. The right face contains the element [2,3,7].

Array Element

☒ ARRAY

| | |
|------------------------|---|
| Element (1 dimension) | 3 |
| Element (2 dimensions) | 4 |
| Element (3 dimensions) | 8 |

A value other than '0' (minus value, for example) can be specified as an offset ([array start value]...[array end value]).

| | Label Name | Data Type | Class |
|---|-------------------|------------|------------|
| 1 | Initial Setting_A | Bit(-5..2) | VAR_GLOBAL |
| 2 | Initial Setting_B | Bit(2..6) | VAR_GLOBAL |
| 3 | Initial Setting_C | String(32) | VAR_GLOBAL |

■ Entering array element values directly

When entering array element values directly as an offset ([array start value]...[array end value]), the values are automatically corrected if any of the following conditions is satisfied:

| Condition | Correction | Example |
|--|--|---|
| An entered value exceeds the maximum value. | The value is changed to the maximum value. | Bit(0..2147483648) → Bit(0..2147483647) |
| Values are entered as an offset of the data type for which an array cannot be set. | The values are deleted. | Pointer(0..10) → Pointer |
| The array start value exceeds the array end value. | The values are deleted. | Bit(10..0) → Bit |

Class

Select a class from the pull-down list of "Class."

Safety global labels, standard/safety shared labels, local labels of a safety program, and local labels of a safety FB do not support latch type classes ('RETAIN' is included in a name).

For details on the classes, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Assignment (devices/labels)

Set this item when assigning an arbitrary device or label to a global label.

Devices and labels that can be assigned vary depending on the assignment target label.

The following devices and labels can be assigned to a global label.

- Digit-specified bit devices (example: K4M0)
- Bit-specified word devices (example: D0.1)
- Module labels

However, a device name with a device type specifier suffixed (D0: U, for example) cannot be assigned.

If not assigning a device/label to a label, the label memory is assigned instead. For details on the label memory, refer to the following:

📖 Page 938 Label Memory Types

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

By using the assigned device check function, assigned devices can be checked if they are assigned to other labels.

📖 Page 251 Duplication check

When a device assigned to a global label is deleted automatically due to specific operations (such as changing the data type of the label or adding/deleting/editing a structure member), that can be reported in the "Output" window by selecting "Yes" for the following option:


- [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Operational Setting" ⇒ "Notify when assigned device is deleted"

Precautions

- When specifying a timer or counter device to "Assign (Device/Label)," the assigned device is regarded as a contact (TS, STS, CS) if a bit type device is specified to "Data Type."
When the data type is a word type, the specified device is regarded as a current value (TN, STN, CN).
- An assigned device may not be displayed automatically on a program editor when it is changed to another device. The change is applied to a program editor by converting any or all programs.
- In projects for an RCPUCPU and LHCPUCPU, if a step relay (S) which does not specify a block number (BL□) is specified in "Assign (Device/Label)," the assigned label operates in the same manner as a step relay (S) which does not specify a block number (BL□).

Therefore, the same label operates differently depending on the location of use.


For details on a step relay (S), refer to the following:

 MELSEC iQ-R Programming Manual (Program Design)

- In projects for an FX5CPU where "Use" is set in "To Use or Not to Use SFC" of the CPU parameter, if a step relay (S) which does not specify a block number (BL□) is specified in "Assign (Device/Label)," the assigned label operates in the same manner as a step relay (S) which does not specify a block number (BL□).

Therefore, the same label operates differently depending on the location of use.

For details on a step relay (S), refer to the following:

 MELSEC iQ-F FX5 Programming Manual (Program Design)

■Safety project

Devices and labels that can be assigned vary depending on the assignment target label.

○: Can be assigned, ×: Cannot be assigned

| Global label to be assigned | Assignment target | | | | |
|------------------------------|-------------------|-----------------------|---------------|---------------------|------------------------------|
| | Standard device | Standard global label | Safety device | Safety global label | Standard/safety shared label |
| Standard global label | ○ | ○ | × | × | × |
| Safety global label | × | × | ○ | ○ | × |
| Standard/safety shared label | × | × | × | × | ○ |


■When data type is structure


A device can be assigned for each structure member in the "Structure Device Setting" screen displayed by clicking the "Detailed Setting" button.

(The color of "Detailed Setting" is displayed in pink when no setting exists, and is displayed in blue when the settings have been done.)

When structure array is set for the data type of a label, a device can be assigned to the member of every elements in the structure array with a specific interval by specifying "Structure Array Offset Value" in the "Structure Device Setting" screen. When '0' is entered for "Structure Array Offset Value," a device assigned to the head of the member of the element is assigned to all the members of the element.

Point

Devices assigned to structure members can be deleted in a batch by selecting  ⇒ [Batch Delete of Assigned Device] in the extension display area.

Moreover, the cursor jumps to the following option by selecting  ⇒ [Change Item Name in Hierarchy Display Area].

- "Other Editor" ⇒ "Label Editor Common" ⇒ "Extended Display Setting" ⇒ "Item Name to Show in Hierarchy Display Area"

Precautions

If a structure member is changed after assigning devices to the structure member, the assignment status of devices may be changed.


In that case, assign devices to the structure member in the "Structure Device Setting" screen or in the extension display area of a label editor.

Initial value

Set the initial value of a label.

The availability of initial values differs depending on the data types and classes.

The entry method of an initial values is the same as that of the constants of labels. For details, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

FX5CPUs do not support this setting.


■Applicable range

Initial values of labels will be set when the CPU module is at STOP to RUN. If the values of labels are changed by program, the program operates with the changed initial values.

■Initial values of label of which data type is array

Different initial values for the respective array elements cannot be set. When setting the different values for each array, set the initial value by program.

Precautions

- An initial value cannot be set for a safety global label, local label in a safety program, and standard/safety shared label.
- A global label to which a device is assigned does not operate with the initial label value.
Use the assigned device check function to check if an initial value is set for any global label to which a device is assigned.
( Page 251 Initial value check)

Constant

Constant can be set when "VAR_GLOBAL_CONSTANT" or "VAR_CONSTANT" is specified to the class.

The availability of the constants differs depending on the data type and class.

For details on how to enter the constants, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Comment

Set a label comment for a defined label.

When entering a label comment, a line feed can be inserted in a cell by pressing the **Ctrl** + **Enter** keys. (A line feed is counted as two characters.)

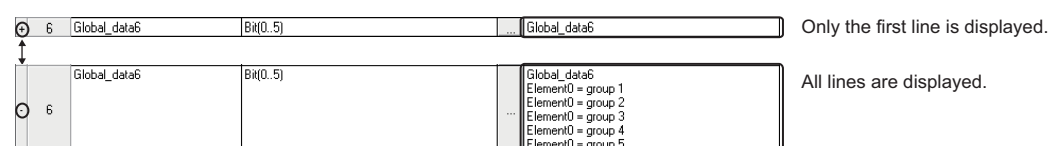
Multiple label comments can be set for one label. (👉 Page 83 Display setting for multiple comments)

To set a label comment for an array element or bit-specified label, use the "Label Comment" window. (👉 Page 253 Setting a label comment)

■Displaying all lines or first line of comments

For the "Comment" columns, data can be entered in multiple lines.

Double-click "+" or "-" to switch the display between all lines or only the first line.



■Copying a device comment

The device comment of a device assigned to a selected label can be copied as the label comment.

When a device is assigned to an array element or bit-specified label, the device comment can be copied as the label comment for the array element or bit-specified label.

However, the device comment of a device assigned to an alias source cannot be copied.

Operating procedure

Select [Edit] ⇨ [Copy Device Comment] (📋).

■Deleting a label comment

A label comment can be deleted by selecting a cell in the comment column in a label editor and pressing the **Delete** key.

However, the label comment for an array element or bit-specified label remains.

To delete the label comment for an array element or bit-specified label, perform any of the following operations:

- Delete the row.
- Change the number of dimensions of the array type label.
- Change the data type of the bit-specified label to other than the word type.

Accessing from external devices

Select this to monitor devices/labels from external devices connected to a CPU module.

If the selection status of "Access from External Device" is changed, the change will not be reflected to the assigned devices/labels.

An error occurs when accessing from an external device to the CPU module in any of the following condition.

- Data type is pointer type/FB
- Class is "VAR_GLOBAL_CONSTANT"
- Index-modified devices

This setting is not available for safety global labels nor standard/safety shared labels.

FX5CPUs do not support this setting.

Checking assigned devices

Duplication check

Devices assigned to global labels are checked if they are assigned to other labels.

Devices duplicated by the array or data type can also be detected.

Moreover, devices satisfied the following conditions can be checked.

| Condition | Duplication example | |
|---|---------------------|----------------------|
| | Device | Data type |
| The digit specification or bit specification is used. | K4X0 | Word type |
| | X2 | Bit type |
| Multiple points are assigned. | D0 | Double-word type |
| | D1 | Word type |
| Other than the start of the array is assigned. | D20 | Word (0..2) type |
| | D21 | Word type |
| A structure member is assigned. | M1 | Structured data type |
| | M1 | Bit type |

Operating procedure

1. Select [Tool] ⇒ [Check the Assigned Device of Global Label].
2. Select the checkbox of "Duplication Check" in the "Check the Assigned Device of Global Label" screen.
3. Click the [Execute] button.

When devices are duplicated, an error message appears in the "Output" window.

Point

Select the checkbox of "Include Bit Specification" to check bit-specified devices as well.
(Example: 'D0' and 'D0.0')

Initial value check

Global labels to which devices are assigned are checked if initial values are set for the labels.

Operating procedure


1. Select [Tool] ⇒ [Check the Assigned Device of Global Label].
2. Select the checkbox of "Initial Value Check" in the "Check the Assigned Device of Global Label" screen.
3. Click the [Execute] button.

When an initial value is set for any of the global labels, an error message appears in the "Output" window.

Creating a defined structure

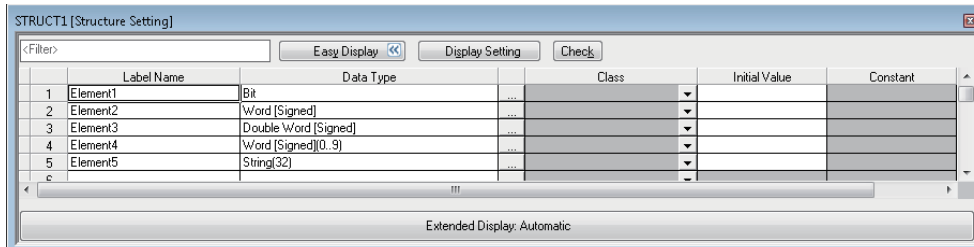
A structure member (local label) can be added to a structure definition.

Up to 5120 structure members can be added.

Be sure to create data of a defined structure in advance. ( Page 132 Creating data)

Window

Select "Label" ⇒ "Structured Data Types" ⇒ "(structure)" in the navigation window.




- Click the [Display Setting] button to select the items to be displayed.
- Click the [Check] button to check errors before converting programs.


Setting reserved area capacities

Reserve area capacities for structure members can be set for each structure definition.

To apply the set reserved area capacities for programs, all the programs are required to be converted (reassigned).

For details on reserved area capacities, refer to the following:

 MELSEC iQ-R Programming Manual (Program Design)

 MELSEC iQ-F FX5 Programming Manual (Program Design)

Operating procedure

1. Select "Yes" for the following option.
[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Structured Data Type" ⇒ "Enable to Set Reserved Area"
2. Select a structure definition in the navigation window.
3. Select [Project] ⇒ [Data Operation] ⇒ [Properties].
4. Set a reserved area capacity in "Reserved Area" of the "Properties" screen, and click the [OK] button.
5. Convert (reassign) all the programs.

Precautions

The reserved area capacities of the following structure definitions cannot be changed.

- System structure definition
- Structure definition necessary for module labels

Exporting/importing structure definitions to/from a file

Structure definitions can be exported to a CSV file or an XML file. Moreover, data in a CSV file can be imported as structure definitions.

The operating procedures and file format are the same as that for a label editor.

For details, refer to the following:


 Page 255 Exporting/importing a label

Setting a label comment

A label comment can be set in a label editor or the "Label Comment" window.

This section explains the method for setting a label comment in the "Label Comment" window.

To set a label comment in a label editor, refer to the following:

 Page 249 Comment

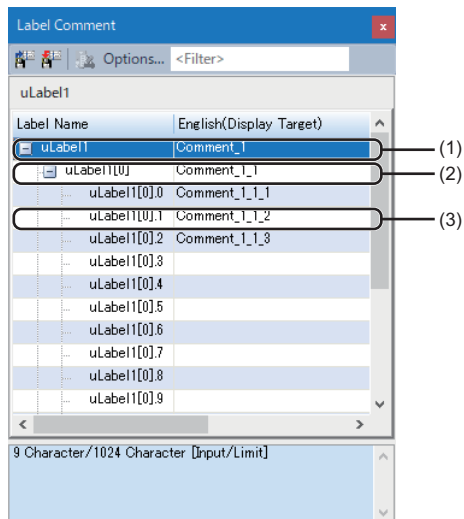
In the "Label Comment" window, a label comment can be set for the following data:

- Label
- Array type label
- Array element
- Bit-specified label
- Structure type label
- Structure member

However, an undefined label is not displayed in the "Label Comment" window.

Window

Select [View] ⇒ [Docking Window] ⇒ [Label Comment] ().



- (1): Label comment
 (2): Label comment for an array element
 (3): Label comment for a bit-specified label

Operating procedure






1. Open a label editor or program editor, and select a label.

The label comment of the selected label is displayed in the "Label Comment" window.

When selecting an array type label or bit-specified label, array elements and labels with bit numbers are displayed in a tree format.

2. Enter a label comment in the comment column.

Point




- When entering a label comment, a line feed can be inserted in a cell by pressing the  +  keys. (A line feed is counted as two characters.)
- Multiple label comments can be set for one label. ( Page 83 Display setting for multiple comments)
- A label editor appears by selecting a cell then performing either of the following operations:
 - Right-click it and select [Open Label Setting] from the shortcut menu.
 - Press the  +  keys.

Precautions

A label comment can be set for up to 1024 array elements in the "Label Comment" window.

To set a label comment for 1025 or more array elements, use one array type label for every 1024 array elements, or enter comments in a ladder editor.

The following table shows the methods for entering a comment for 1025 or more array elements in a ladder editor.

| Method | Operating procedure |
|---|---|
| Entering a comment after entering a label | <ol style="list-style-type: none">1 Select "Yes" for the following option:<ul style="list-style-type: none">• [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter ladder" ⇒ "Operational Setting" ⇒ "Enter label comment and device comment"2 Select a cell to enter a comment for, then double-click it or press the  key.3 Click the [OK] button in the element entry dialog, or press the  key.4 Enter a comment in the "Input Comment" screen. |
| Entering a comment directly | <ol style="list-style-type: none">1 Select the following menu to display comments in a ladder editor:<ul style="list-style-type: none">• [View] ⇒ [Comment Display]2 Select a cell and press the  key twice.3 Enter a comment directly. |

Copying a device comment

The device comment of a device assigned to a selected label can be copied as the label comment.

The device comment of a device assigned to an alias source can also be copied.



Operating procedure

Right-click a label and select [Copy Device Comment] () from the shortcut menu.

Exporting/importing label comments to/from a file

Label comments can be exported to a CSV file. In addition, label comments in a CSV file can be imported into the "Label Comment" window.

Operating procedure

1. Open the "Label Comment" window.
2. Right-click on the window and select [Export to File] () / [Import File] () from the shortcut menu.

■CSV file format

The column titles (Label Name and comment) in the "Label Comment" window and header names in a CSV file are linked. Contents in the "Label Name," "Data Type," and "Assignment (device)" columns in a CSV file are not exported.


Data can be imported even when the column order in a CSV file does not match with that in the "Label Comment" window.

Exporting/importing a label


Data in a label editor can be exported to a CSV file or an XML file. Moreover, data in a CSV file can be imported into a label editor.

Operating procedure

■Exporting data

1. Open a label editor.
2. Select [Edit] ⇒ [Export to File] (.
3. Select the checkbox of either of the following items in the "Export to File" screen, and click the [Execute] button.
 - Export to CSV File. (Exclude comment for array element/bit specification and assignment device of structures.)
 - Export to XML File. (Include comment for array element/bit specification and assignment device of structures and structure arrays.)

■Importing data

1. Open a label editor.
2. Select [Edit] ⇒ [Import File] (.

CSV file

■Format

The column titles (Class, Label Name, Data Type, etc.) in a label editor and header names in a CSV file are linked.

- In a label editor, only the data of which column titles match with header names in a CSV file is imported. To exclude the specific data, delete the column from the CSV file.
- To import data from a CSV file exported in GX Works3 with a different language, edit the header names in the CSV file to match with the column titles displayed in the label editor of the import target GX Works3.
- Data can be imported even when the column order in a CSV file does not match with that in a label editor.
- When "Access from External Device" is selected, '1' is output. As for it is not selected, '0' is output. When editing a CSV file, set '1' or '0.'

Point

The files exported from GX Works2 can be imported to GX Works3.

Before importing a CSV file exported from GX Works2, edit the header names in the CSV file to match the column titles in a label editor of GX Works3.

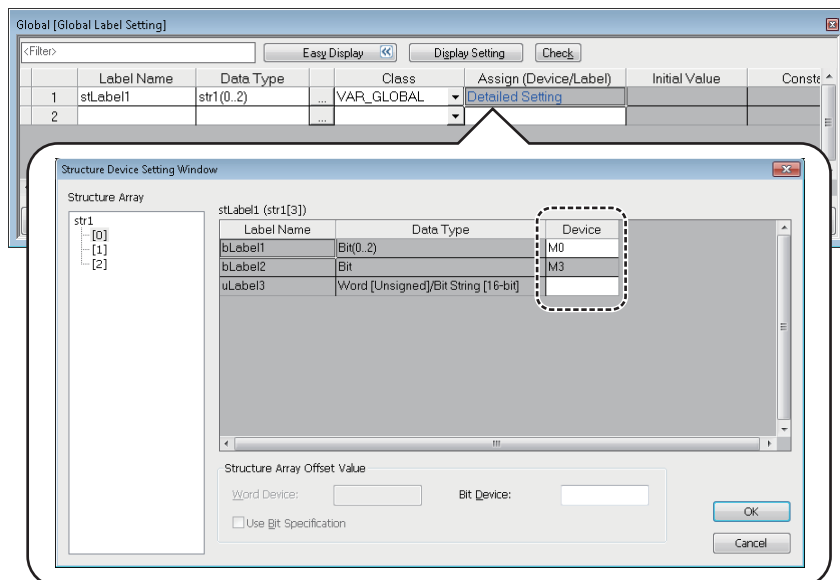
XML file

Devices assigned to structure members can also be exported to an XML file.

The assigned devices can be checked in a list by opening this file in another application such as Excel.

Ex.

The following shows the method to export data in a label editor to an XML file and check the devices assigned to structure members in Excel.



Operating procedure

1. Export data of a label editor. (Page 255 Exporting data)
2. Start Excel.
3. Drag and drop the XML file onto Excel.
4. Select the checkbox of "As an XML table" in the "Open XML" screen, and click the [OK] button.

The opened file is displayed as follows:

| | (1) Data names of the global labels | (2) Label names | (3) Data type (structured data type) | (4) Structure member names | (5) Assigned devices |
|----|-------------------------------------|-----------------|--------------------------------------|----------------------------|----------------------|
| 1 | Global | stLabel1 | str1 | | |
| 2 | Global | stLabel1 | str1 | bLabel1 | M0 |
| 3 | Global | stLabel1 | str1 | bLabel2 | M3 |
| 4 | Global | stLabel1 | str1 | uLabel3 | GV:0A000 |
| 5 | Global | stLabel1 | str1 | bLabel1 | M4 |
| 6 | Global | stLabel1 | str1 | bLabel2 | M7 |
| 7 | Global | stLabel1 | str1 | uLabel3 | GV:0A004 |
| 8 | Global | stLabel1 | str1 | bLabel1 | M8 |
| 9 | Global | stLabel1 | str1 | bLabel2 | M11 |
| 10 | Global | stLabel1 | str1 | uLabel3 | GV:0A008 |

- (1): Data names of the global labels
- (2): Label names
- (3): Data type (structured data type)
- (4): Structure member names
- (5): Assigned devices

Registering an undefined label


An undefined label can be registered on a label editor.

Operating procedure

■Ladder editor, FBD/LD editor

1. Enter the name of a label to be registered on an editor.
2. Set each item in the "Undefined Label Registration" screen and click the [OK] button.

■ST editor

1. Enter the name of a label to be registered on an editor.
2. Select the token of a label name, and select [Edit] ⇒ [Register Label] ()
3. Set each item in the "Undefined Label Registration" screen and click the [OK] button.

5.3 Registering Module Labels

This section explains the registration methods of module labels.

Registering as global labels

Module labels are registered when the module setting has been set as "Module Label: Use" in the confirmation screen displayed after performing either of the following operations.

- Place a module on the module configuration diagram and fix parameters.
- Add a new module in the navigation window.

The registered module labels are displayed in "Global Label" in the navigation window and in the [Module] tab in the element selection window.

To use a module label in a program, enter a module label name directly or drag and drop it from the element selection window.



To use a module label under arbitrary name, set alias to the module label.

Precautions

■ Considerations when registering module labels

Since all the registered module labels are written to a CPU module, the memory capacity of the CPU module may be exceeded. In this case, perform any of the following operations.

- Change the write target of the global labels to SD memory card.
- For FX5CPU, the writable capacity is the same as that of the CPU module even when data is written to an SD memory card.

■ Module label with the name that starts with 'zReserve'

Do not write data to the module label with the label name that starts with 'zReserve' among the module labels. Doing so may cause malfunction of the programmable controller systems.

Ex.

'Instance name'_'Module number'.'Label name' GF11_1.zReserveAreaSB00007

■ Registering public labels set with the motion control setting function

Public labels can be registered in global labels of GX Works3 as module labels by selecting the following menu using the motion control setting function.

- [Convert] ⇒ [Reflect Public Labels]

After registering the labels, the global labels of GX Works3 and the program in which the global labels are used will be in the unconverted state. For details on public labels, refer to Help for the motion control setting function.

Editing module labels

When editing a module label (M+Global) which is registered as a global label on a label editor, only the following operations can be performed:

- Selecting and deleting a row
- Editing a comment

Do not edit and add a label on the label editor.

Re-registering deleted module labels

To register the module labels which got deleted from a global label editor again, select and right-click a module name displayed in the [Module] tab in the element selection window, then select [Add Module Label] from the shortcut menu.

Editing structures

Once module labels are registered, the definitions of the structures in the module labels are registered into "Structured Data Types" in the navigation window.

A defined structure can be copied in the navigation window. The copied defined structure of the module label is changed from "+" to "_".

Consideration

When changing the start I/O number of a module whose module label is used, programs will be in the unconverted state, and all the programs are required to be converted (reassigned).

5.4 Registering Tag FBs

In projects for an RnPCPU and an RnPSFCPU, tag FBs can be used in an FBD/LD program with the process control extension enabled.

To use tag FBs, they are required to be registered on the tag FB setting editor in advance.

Enter a tag name, tag FB type, and comment, then click the [Apply] button.

Up to 1000 tag FBs can be registered into a project.

For details on tag FBs, refer to the following:

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

Precautions


To use tag FBs, it is recommended to register and apply them on the tag FB setting editor before adding data of a program block, function block, function, global label, and structure definition.

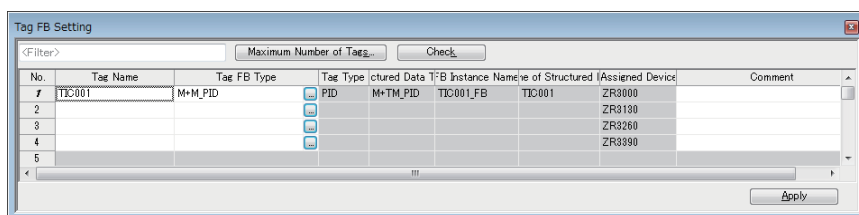
When a lot of data mentioned above is registered in a project, it may take time to apply the tag FB setting.

Configuration of the tag FB setting editor

The following shows the screen configuration of the tag FB setting editor.

Window

- Select [Tool] ⇒ [Process Control Extension] ⇒ [Tag FB Setting].
- Click  (Tag FB Setting) on the toolbar.





Displayed items

| Item | Description |
|---------------------------------|---|
| Filter | Data can be filtered. A wild card (such as '*' and '?') is not applied as a filtering condition. A character string including the wild card is displayed. |
| [Maximum Number of Tags] button | Click this to check and set the following option: • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "Maximum Number of Tags" |
| [Check] button | Click this to check if there are any errors. |

■ Setting items

○: Editable, ×: Not editable

| Item | Editability | Description |
|------------------------------------|-------------|--|
| Tag Name | ○ | Enter a tag FB name. |
| Tag FB Type | ○ | Select the tag FB type of a tag FB instance. |
| Tag Type | × | The tag type of a tag FB instance is displayed. |
| Structured Data Type | × | A structure definition name of tag data is displayed. |
| FB Instance Name | × | A tag FB instance name is displayed. |
| Label Name of Structured Data Type | × | A tag data name is displayed. |
| Assigned Device | × | The following device is assigned. • The start device of a system resource + 3000 + ((row number - 1)*130) Set the system resource in [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource" ⇒ "File Register: ZR." |
| Comment | ○ | Enter a comment that is applied to a comment of a tag FB instance and tag data. |

- By clicking the [Check] or [Apply] button, the versions of tag data and a process control function block in a project can be checked whether they are supported in GX Works3 where the project is open. To update the versions, click the [Yes] button in the confirmation message appeared.
For additions and changes in a process control function block with a version upgrade, refer to 'Version Upgrade' in the following manual:
 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)
- Converting (reassigning) all programs may be required after updating the version of tag data or a process control function block.
- The initial values of FB properties return to the default after updating the version of tag data or a process control function block. However, the initial values can easily be set again by exporting the values in the "FB Property Management (Offline)" screen before updating the version, then importing them after the update.
( Page 408 FB property management (offline))

Editing a row

■ Adding a row

A row can be added above a selected row. (Multiple selections allowed.)

Assigned devices in each tag FB setting is changed after the addition.

Operating procedure


Select [Edit] ⇒ [New Declaration (Before)]()

■ Deleting a row

A selected row can be deleted. (Multiple selections allowed.)

Assigned devices in each tag FB setting is changed after the deletion.

Operating procedure

Select [Edit] ⇒ [Delete Row]()

■ Copying a row

By clicking the [Apply] button after copying or cutting a row and pasting, the initial value of the FB property in the copy source is retained. However, it will not be retained if the tag FB type is changed after pasting.

■ Setting an applicable/inapplicable row

The number of rows set in [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "Maximum Number of Tags" will be applicable and other rows will be inapplicable as follows:


- Applicable row: Included in checking and applying the tag FB setting
- Inapplicable row: Excluded from checking and applying the tag FB setting. In addition, the information cannot be edited.

The option can be checked and set by clicking the [Maximum Number of Tags] button on the tag FB setting editor.

Entering information

Tag name

Set a name with avoiding the following conditions:


- Label name starting with a number
- Same label name as one for a device
- Label name including an unusable character (reserved word) ( Page 927 Unusable character strings for a label name)

Use only alphanumeric characters when monitoring data on a faceplate or exporting an assignment information database file.


Tag FB type

Select a tag FB in the "Select Tag FB Type" screen displayed by clicking the [...] button in the "Tag FB Type" column.

For details on manufacturer-defined tag FB types, refer to the following:

 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

For details on user-defined tag FBs, refer to the following:

 Page 518 Creating a user-defined tag FB

Comment

Use only alphanumeric characters when monitoring data on a faceplate or exporting an assignment information database file.

Online program change

The following table shows whether to perform the online program change and initialize data with change for tag FBs.

○: Can be performed, ×: Cannot be performed

| Change for tag FBs | | Online program change | Initialization |
|--------------------|---|-----------------------|-----------------|
| FB property | Changing an initial value | ○ | Not initialized |
| Tag FB setting | adding a tag FB | ○ | Initialized |
| | Changing a tag name ^{*1} | ○ | Not initialized |
| | Changing the tag FB type ^{*1} | × ^{*2} | — |
| | Changing a tag type ^{*1} | × ^{*2} | — |
| | Changing a declaration position ^{*1} | × ^{*2} | — |
| | Changing a comment ^{*1} | ○ | Not initialized |
| | Deleting the tag FB setting ^{*1} | ○ | Not initialized |

^{*1} For change for an applied tag FB

^{*2} When changing data, all programs are required to be converted (reassigned).

Data to be added with tag FB registration

By applying the data after entering a tag name and selecting the tag FB type on the tag FB setting editor, the tag FB instance and tag data are created in "M+PTAG" under "Global Label."

The definition of a tag FB and the structure definition of tag data are added in the navigation window as a read-only definition.

Ex.

When the tag name is 'TIC001' and the tag FB type is 'M+M_PID'

| Data/definition to be added | Name | Location |
|---|---|--|
| Tag FB instance | TIC001_FB | "Label" ⇒ "Global Label" ⇒ "M+PTAG" in the navigation window |
| Definition of a tag FB | M+M_PID | FB/FUN ⇒ (FB file name) in the navigation window |
| Tag data | TIC001 | "Label" ⇒ "Global Label" ⇒ "M+PTAG" in the navigation window |
| Structure definition of tag data | M+TM_PID | "Label" ⇒ "Structured Data Types" in the navigation window |
| Definition of a function block referred from tag FB | M+P_MCHG M+P_IN M+P_PHPL M+P_PID M+P_OUT1 | FB/FUN ⇒ (FB file name) in the navigation window |

Precautions

If the definition of a tag FB, the structure definition of tag data, and the definition of a user-defined tag FB are deleted in the navigation window, a project may become incorrect.

Before deleting these definitions, search a project for the FB definition names and structure name by using the character string search function to check that they are not used.

Tag FB instance and tag data registered in "M+PTAG"

Only the initial value can be set for a tag FB instance registered in the global label setting "M+PTAG."

Window

Select "Label" ⇒ "Global Label" ⇒ "M+PTAG" in the navigation window.

Precautions


Do not delete "M+PTAG" from a project.

Display/setting an FB property

The initial value of a tag FB instance can also be set in the "FB Property" window.

The display contents in the "FB Property" window is linked with the contents in the selected row on the FB setting editor.

For details on the "FB Property" window, refer to the following:

 Page 387 Display/setting an FB property

In the "FB Property" window, the initial value of a tag FB instance which has already been applied on the tag FB editor is displayed. A tag FB which is not applied, excluded from applying, or for which setting contents are changed after application is not displayed.

5.5 Registering System Labels

This section explains the method to register global labels as system labels.
Only standard global labels support system labels.

About system labels

Using the system labels controlled by MELSOFT Navigator enables programming with the same label names among the iQ Works supported products (GX Works3, MT Developer2, GT Designer3).
Once a workspace is saved with MELSOFT Navigator, a database to manage system labels is created in the workspace.
System labels cannot be used in a workspace without the system label database.
For details on MELSOFT Navigator, refer to MELSOFT Navigator Help.

Precautions

Since module labels are read only, they cannot be registered as system label.

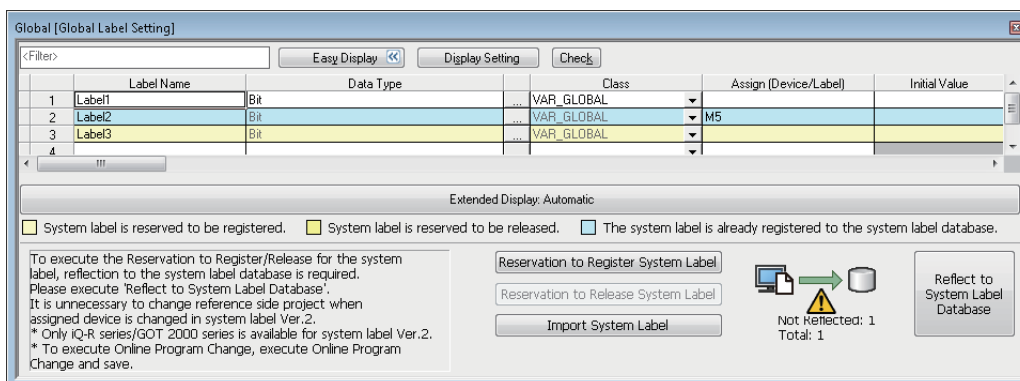
System label version

There are two types of system labels for MELSOFT Navigator: system label ver.1 and system label ver.2.
FX5CPUs only support system label ver.1.
LHCPUs do not support either of the system labels.
For more details on the differences between system label ver.1 and system label ver.2, and creation methods of each system label database, refer to MELSOFT Navigator Help.

Configuration of a label editor

Window

Select "Label" ⇒ "Global Label" ⇒ "(global label)" in the navigation window.



Displayed items

| Item | Description |
|-----------------------|---|
| System Label Relation | Displays the relation between the global label and the system label. <ul style="list-style-type: none"> • Disclose: The status in which the global labels are open as the system labels • Reference: The status in which the system labels opened by other projects are imported in the global labels • Blank: The status in which the global labels is not related to the system labels |
| System Label Name | Displays the system label name related to the global labels. |
| Attribute | Displays the attribute of the system label which is related to the global labels. |

Registering labels in system label database

Disclose standard global labels created with GX Works3 as system labels.

When registering in a system label database for the first time, create a workspace with MELSOFT Navigator and save a GX Works3 project in the workspace in advance.

Operating procedure

1. Display a global label editor.
2. Select labels to be registered as system labels, and click the [Reservation to Register System Label] button.
3. Click the [Reflect to System Label Database] button.
The "Check before registering in system label database" screen appears.
4. Check the list of labels to be registered, and click the [Register] button.

Precautions

- The structure array type global labels for which "Structure Array Offset Value" has been set cannot be registered in the system label database.
- Label comments for array elements and bit-specified labels cannot be registered in the system label database.

Importing system labels in system label database to GX Works3

Import the system labels registered with MELSOFT Navigator or other projects to a project.

Operating procedure

1. Display a global label editor.
2. Click the [Import System Label] button.
The "Import System Labels to Project" screen appears.
3. Select system labels to be imported, and click the [Import] button.

Releasing system labels

Release the relation with the system label database, and restore system labels to normal global labels.

Operating procedure

1. Display a global label editor.
2. Select the labels of which relation is to be released from the labels registered as system labels.
3. Click the [Reservation to Release System Label] button.
4. Click the [Reflect to System Label Database] button.
The "Check before registering in system label database" screen appears.
5. Check the list of labels to be released, and click the [Register] button.

Verifying system label information

Compare the system label information of GX Works3 projects to the system label database, and check if there is any difference.

If differences exist, correct the system label information of the GX Works3 projects, and synchronize the information with the system label database.

Operating procedure

1. Select [Edit] ⇒ [System Label] ⇒ [Execute Verification Synchronous with System Label].
2. Check and correct information in the "Execute Verify and Synchronize with system label" screen.
3. Click the [Reflection] button.

Importing the changes of system label database

Import the changed contents to the GX Works3 projects when the system labels used in a project have been changed in other projects.

Importing the changes automatically

Operating procedure

Click the [Yes] button on the message to confirm whether or not import the changed contents, which appears when any of the following operations is performed in a state where a system label change notification has been received.

- Opening a project
- Saving a project
- Applying labels to system label database
- Displaying the "Online Data Operation" screen
- Starting a simulation


Click the [No] button to import them after checking the changed contents. (☞ Page 267 Importing after checking the changes)

Importing after checking the changes

When the system label information in the GX Works3 projects is different from the system label database, the icon to notify the changes is displayed at the lower-left corner of the GX Works3 screen.

Check the contents that have been changed when the icon is displayed. In addition, import the changed contents to the GX Works3 projects.

Operating procedure

1. Select [Edit] ⇒ [System Label] ⇒ [Check the changes of the System Label Database]().
2. Check the information in the "Import Change Contents of System Label Database" screen.
3. Click the [Import] button.

PART 3 PROGRAMMING

This part explains the functions in editors for editing sequence programs and setting of the device memory and initial values.

6 CREATING PROGRAMS

7 SETTING DEVICE MEMORY

8 INITIAL DEVICE VALUE SETTING

9 SEARCHING FOR DATA

10 SEGMENTING PROGRAMS

6 CREATING PROGRAMS

This chapter explains the creation method of a program.
Remote head modules do not support creating a program.

6.1 Programming Function

Features and types of programming language

The following table shows the programming languages supported by GX Works3.

| Programming language | Name | Description | Creation method of a program | Language specification |
|----------------------|---------------------------------------|---|-------------------------------------|--|
| Ladder ^{*1} | Ladder Diagram | A graphic language using ladder programs composed of contacts and coils. The inline structured text functions to edit ST programs on a ladder editor can be used. | Page 276 Creating a Ladder Program | IMELSEC iQ-R Programming Manual (Program Design) IMELSEC iQ-F FX5 Programming Manual (Program Design) |
| ST | Structured Text | Control syntax such as selection branch by conditional syntax or repetitions by iterative syntax can be controlled, as in the high-level language such as C language. By using these syntax, concise programs can be written. | Page 320 Creating an ST Program | |
| FBD/LD | Function Block Diagram/Ladder Diagram | A graphic language for creating a control program only by placing and connecting an element. The inline structured text functions to edit ST programs on an FBD/LD editor can be used. | Page 330 Creating an FBD/LD Program | |
| SFC | Sequential Function Chart | A graphic language for clarifying the execution order and the execution condition of a program | Page 353 Creating an SFC Program | |

*1 Safety programs are supported.

Features and the type of POUs

The following table shows the usable POUs in a program.

| POU | Description | Reference |
|----------------|--|------------------------------------|
| Function block | An element that has the internal memory and output an operation result according to values in the memory and the input value | Page 505 Creating a Function Block |
| Function | An element that has no internal memory and output always the same operation result for an same input value | Page 525 Creating a Function |

Entering global devices/local devices

To use global devices and local devices individually, enter the devices as follows:

- Standard global device: Enter a device name (Example: D10)
Safety global device: Prefix 'SA\' to the device name (Example: SA\D10)
- Standard local device: Prefix '#' to the device name (Example: #D10)
Safety local device: Prefix 'SA\#' to the device name (Example: SA\#D10)

For details of the global device/local device, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

Note that FX5CPUs do not support local devices.

Entering global labels/local labels

When a label with the same name exists in both global labels and local labels, the label in a program is handled as follows:

- After a global label and a local label are registered, the label names are entered in the program: Treated as a local label.
- After a global label is registered, the label name is entered in the program, and then a local label with the same name is registered: Treated as a local label.
- After a local label is registered, the label name is entered in the program, and then a global label with the same name is registered: Treated as a local label.

The global labels and local labels can be distinguished by setting the different color in the "Color and Font" screen.

Creation procedure

1. Create data of a program block. (📖 Page 132 Creating data)
2. Set the execution order and the execution type. (📖 Page 272 Program Execution Order and Execution Type Settings)
3. Create a program. (📖 Page 276 Creating a Ladder Program, Page 320 Creating an ST Program, Page 330 Creating an FBD/LD Program, Page 353 Creating an SFC Program)
4. Check the created program. (📖 Page 428 Checking a Program)
5. Convert the program. (📖 Page 432 Converting Programs)

6.2 Program Execution Order and Execution Type Settings


This section explains the setting method of the execution order and the execution type of a program.

Program execution order setting

Set the execution order for program blocks in a program file.

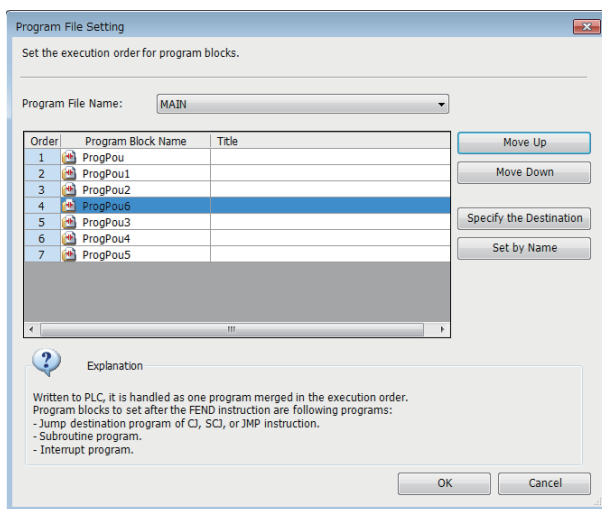
An SFC program is executed according to the block numbers. Check the block numbers in an SFC block list.

To change the execution order for the SFC program, change the block numbers in the "Properties" screen of each SFC block. Refer to the following to set the execution order of a program file of the scan execution type with the process control extension enabled.

 Page 274 Execution order

Window

- Select [Convert] ⇒ [Program File Setting].
- Select a program file in the navigation window, then right-click it and select [Program File Setting] from the shortcut menu.



Operating procedure

1. Select a program file name.
2. Set an execution order for program blocks, then click the [OK] button.

Point

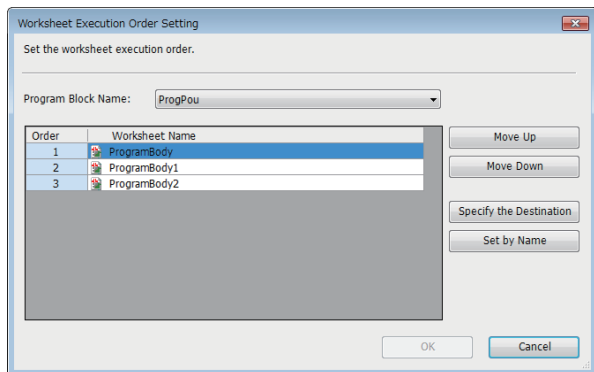
Program files can be sorted in the execution order specified in the program file setting. Select and right-click a file in the navigation window, then select [Sort] ⇒ [Execution Order] from the shortcut menu.

Worksheet execution order setting

When multiple program bodies are included in a POU, the execution order for the program bodies can be set. This setting is allowed to POU's used in an ST program and FBD/LD program.

Window

- Select [Convert] ⇒ [Worksheet Execution Order Setting].
- Select a POU in the navigation window, then right-click it and select [Worksheet Execution Order Setting] from the shortcut menu.



Operating procedure

1. Select a program body.
2. Set the execution order for programs, then click the [OK] button.

Point

Program bodies can be sorted in the execution order specified in the worksheet execution order setting. Select and right-click a POU in the navigation window, then select [Sort] ⇒ [Execution Order] from the shortcut menu.

Program execution type change

One of the following execution types can be specified to a program: Initial, Scan, Fixed Scan, Event, Standby, or No Execution Type.

For details, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

Only 'Fixed Scan' can be specified in safety programs.

Setting method

To set the execution type, right-click on a target program in the navigation window and select [Register Program] from the shortcut menu, or drag the program and drop it onto the target execution type.

The set execution type will be applied to "Program Setting" of "CPU Parameter."

Execution control of an FBD/LD program for process control

The following explains the setting methods for the execution control of an FBD/LD program for process control.

Executing method

There are two methods to execute an FBD/LD program for process control: timer execution and interrupt execution (fixed scan). Select either of the execution methods in accordance with the intended use of the program.


For details, refer to the following:

 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)


Execution order

Set execution order for a program file of the scan execution type with the process control extension enabled in the "Program File Setting" screen.

Operating procedure


- 1.** Display the "Program File Setting" screen by any of the following operations:
 - Select [Tool] ⇒ [Process Control Extension] ⇒ [Program File Setting]
 - Click  (Program File Setting) on the process control extension toolbar.
 - Select and right-click a program file in the navigation window, then select [Program File Setting] from the shortcut menu.
- 2.** Set an execution order for program blocks, then click the [OK] button.

Point

- For details on the "Program File Setting" screen, refer to the following:
 -  Page 275 Program File Setting screen
- Program files can be sorted in the execution order specified in the program file setting. Select and right-click a file in the navigation window, then select [Sort] ⇒ [Execution Order] from the shortcut menu.

Execution interval and phase

Execution interval and phase of an FBD/LD program for process control can be set in either of the following screens.

- "Properties" screen of an FBD/LD program for process control ( Page 143 Properties)
- "Program File Setting" screen

For details on the execution interval and phase, refer to the following:


 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

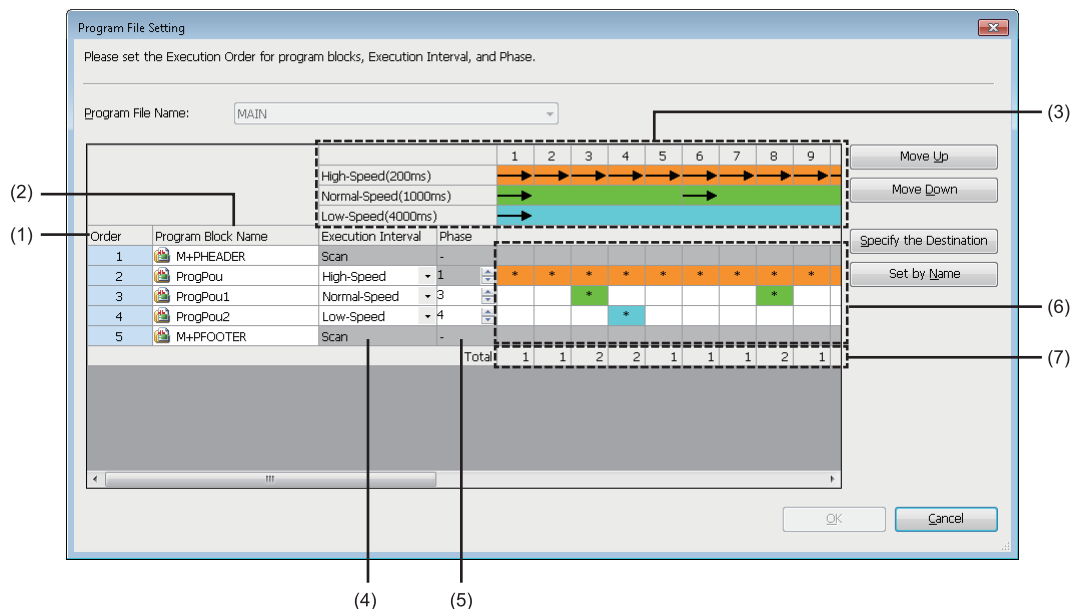
The following explains the "Program File Setting" screen.

■Program File Setting screen

In the "Program File Setting" screen, the execution intervals and phases of program blocks in a program file with the process control extension enabled can be set in a batch.

Window

- Select [Tool] ⇒ [Process Control Extension] ⇒ [Program File Setting]
- Click  (Program File Setting) on the toolbar.
- Select a program file in the navigation window, then right-click it and select [Program File Setting] from the shortcut menu.



Displayed items

| Item | Description |
|---------------------------------|--|
| (1) Order | Displays the execution order for program blocks. |
| (2) Program Block Name | Displays program block names. |
| (3) Execution interval (header) | Display contents are changed according to the value set for the following option. • [Tool] ⇒ [Options] ⇒ "Process Control Extension Setting" ⇒ "Program Execution" ⇒ "Execution Interval" |
| (4) Execution Interval | Displays the execution interval of each program. Execution intervals can be changed from the pull-down list. |
| (5) Phase | Displays the phase of each program. Phases can be changed by entering a value. |
| (6) Execution timing | Displays the timing to execute each program. ("*" indicates the program execution.) "*" is displayed only for the program blocks created in Function Block Diagram/Ladder Diagram language. |
| (7) Total | Displays the total numbers of programs executed at each execution timing (total number of "*" displayed in each column of 'Execution timing'). If no program block is executed, '0' is displayed. |

6.3 Creating a Ladder Program

This section explains the creation method of a ladder program.

Detailed specifications of a ladder program are described in the following manuals. Please read them in advance.

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Point

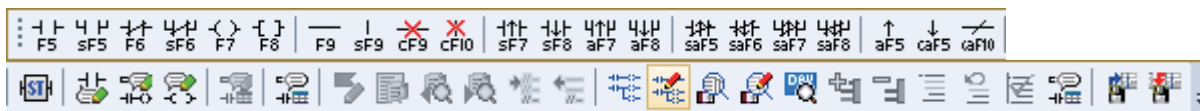
The display format and detailed operation settings for each function can be set by setting the following option.
[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor"

Configuration of a ladder editor

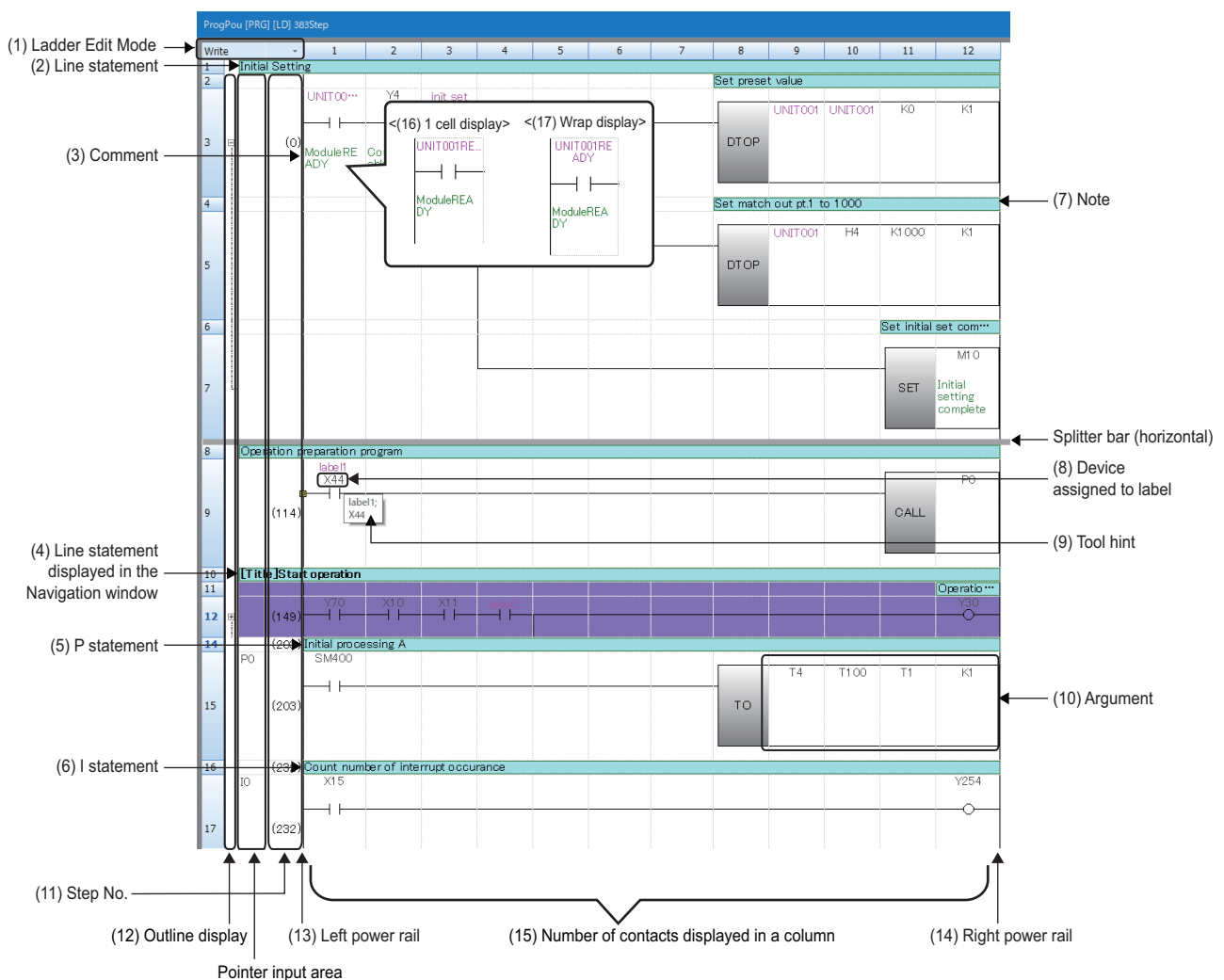
Window

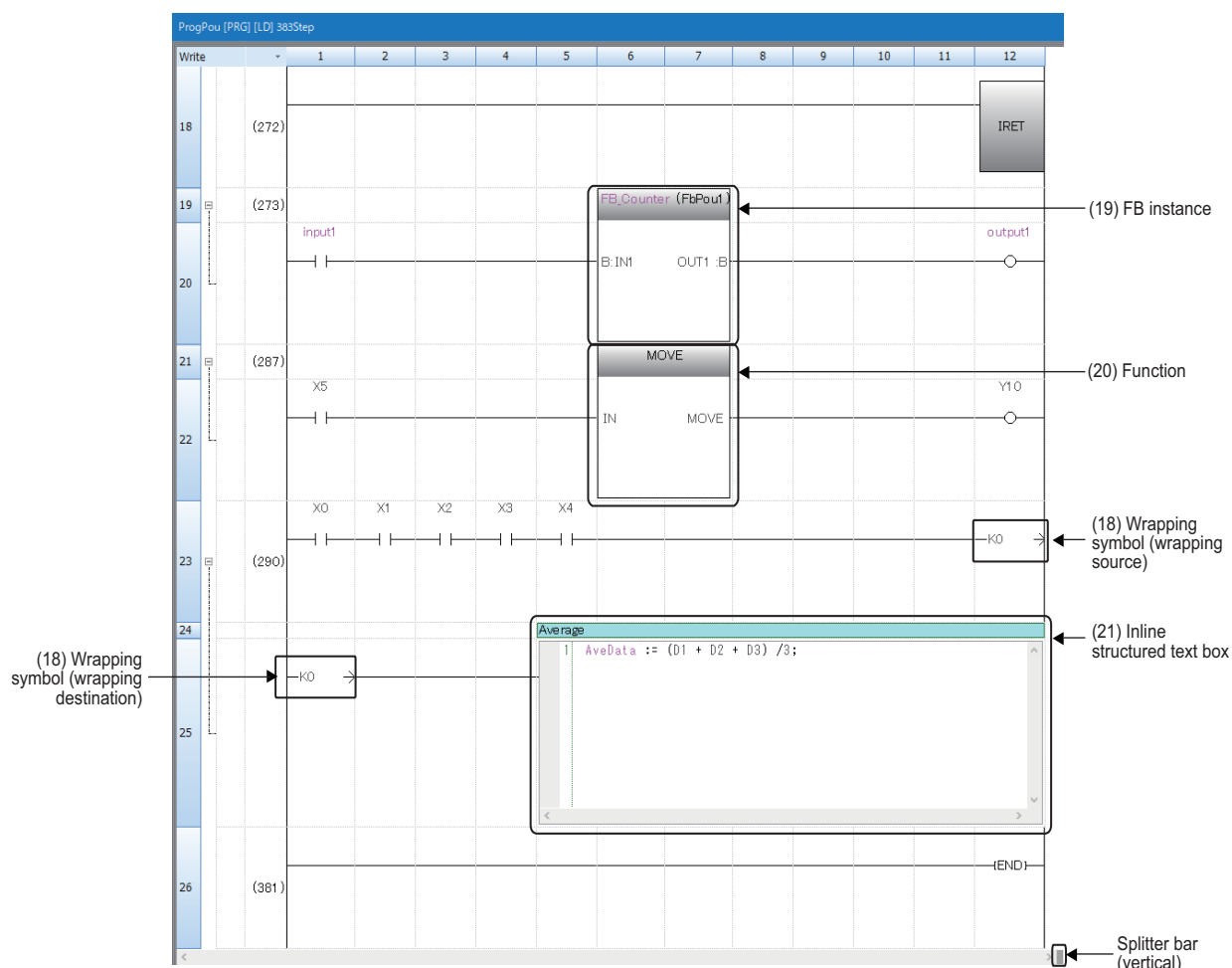
Select "Program" ⇒ "(execution type)" ⇒ "(program file)" ⇒ "(program block)" ⇒ "ProgramBody" in the navigation window.

■ Toolbar










■ Ladder editor






Displayed items

| Item | Description | Related operation |
|---|---|--|
| (1) Ladder edit mode | An area that displays the ladder edit mode: Write, Read, Write Mntr (monitor write), or Read Mntr (monitor read) | Switching mode  Page 280 Switching the ladder edit mode (read/write/monitor read/monitor write) |
| (2) Line statement | A comment that is appended to a ladder block | Entering elements  Page 295 Entering comments/statements/notes |
| (3) Comment | A comment set to a device/label | Show/Hide [View] ⇨ [Comment Display]/[Statement Display]/[Note Display] |
| (4) Line statement displayed in the navigation window | A line statement that is displayed in the tree in the navigation window | Hierarchy display setting for structure comments [Tool] ⇨ [Options] ⇨ "Other Editor" ⇨ "Label Editor Common" ⇨ "Display Setting" ⇨ "Hierarchy Display Setting for Structures Comment" |
| (5) P statement | A comment that is appended to a pointer number | Label comments for a structure and its member can be displayed together by setting this option to "In Order of Instance -> Member" or "In Order of Member -> Instance." |
| (6) I statement | A comment that is appended to an interrupt pointer number | |
| (7) Note | A comment that is appended to a coil/application instruction in the program | Settings  Page 235 Registering Labels Show/Hide [View] ⇨ [Display Device] () |
| (8) Device assigned to label | A device assigned to a label. Only labels displayed on a ladder editor can be edited, searched for and replaced. A device with any of the following conditions is not displayed. <ul style="list-style-type: none"> A device that is assigned by converting the program A device that is assigned to a label used for an array index A device that is assigned to a structure type label | |
| (9) Tool hint | The information on device/label where the mouse cursor is placed over is displayed | Changing display contents [Tool] ⇨ [Options] ⇨ "Program Editor" ⇨ "Ladder Editor" ⇨ "Tool Hint" |
| (10) Argument | A value or label name/device name to be operated | — |

| Item | Description | Related operation |
|---|--|--|
| (11) Step No. | The start Step No. of a ladder block | — |
| (12) Outline display | A symbol that indicates the status (collapse/expand) of a ladder block | ■Show/Hide • [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" • [View] ⇒ [Outline] ⇒ [Show/Hide of Outlines] |
| (13) Left power rail | The power rails of a ladder program | — |
| (14) Right power rail | | |
| (15) Number of contacts displayed in a column | The maximum number of cells which are occupied with contacts, coils, and instructions. When the maximum number of contacts is exceeded, the line will be wrapped automatically. | ■Changing number of contacts [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" |
| (16) 1 cell display | The rest of a device/label name is omitted by ellipses "..." in order for the name to be fit in one cell. | ■Switching display [View] ⇒ [Change Display Format of Device/Label Name] ⇒ [1 Cell Display]/[Wrapping Ladder Display] |
| (17) Wrap display | A long device/label name is wrapped to be fit in one cell. If the label name still cannot be displayed in one cell, the rest of the name is omitted by ellipsis "...". | |
| (18) Wrapping symbols | The wrapping symbols are displayed at wrapping source and wrapping destination. The same numbers (serial numbers) are assigned to the wrapping source symbol and the wrapping destination symbol that are created in pairs. Wrapping symbols cannot be connected to the output circuits of an FB instance or a function. | — |
| (19) FB instance | An entity of a function block used in a ladder program | ■Insertion  Page 284 Inserting a function block |
| (20) Function | An entity of a function used in a ladder program | ■Insertion  Page 290 Inserting a function |
| (21) Inline structured text box | An area where an ST program can be edited on a ladder editor | ■Insertion  Page 292 Inserting an inline structured text box |

Point

Font color, background color, and font can be changed.

 Page 82 Checking and Changing Colors and Fonts

By using the following menu, the display magnification of a ladder editor is automatically adjusted according to the window width.

- [View] ⇒ [Zoom] ⇒ [Fit the editor width to the window width] 

By using the following menu or option, the character size is automatically adjusted according to the display magnification of a ladder editor.

- [View] ⇒ [Text Size] ⇒ [Autofit]
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Autofit Text Size"

By performing the following operation, the "Column Width" screen appears and a column width can be changed:

- Select and right-click a column, then select [Column Width] from the shortcut menu.

In addition, by setting the following option to "Set to Optimized Width," a column width can be adjusted to the optimal width according to the elements within the range displayed in an editor when double-clicking the column header border:

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Operation in adjusting column width by mouse"

Splitting a ladder editor

The following show the procedures for splitting a ladder editor.

■Horizontal split

Operating procedure

Drag the splitter bar (horizontal) downward or double-click it.

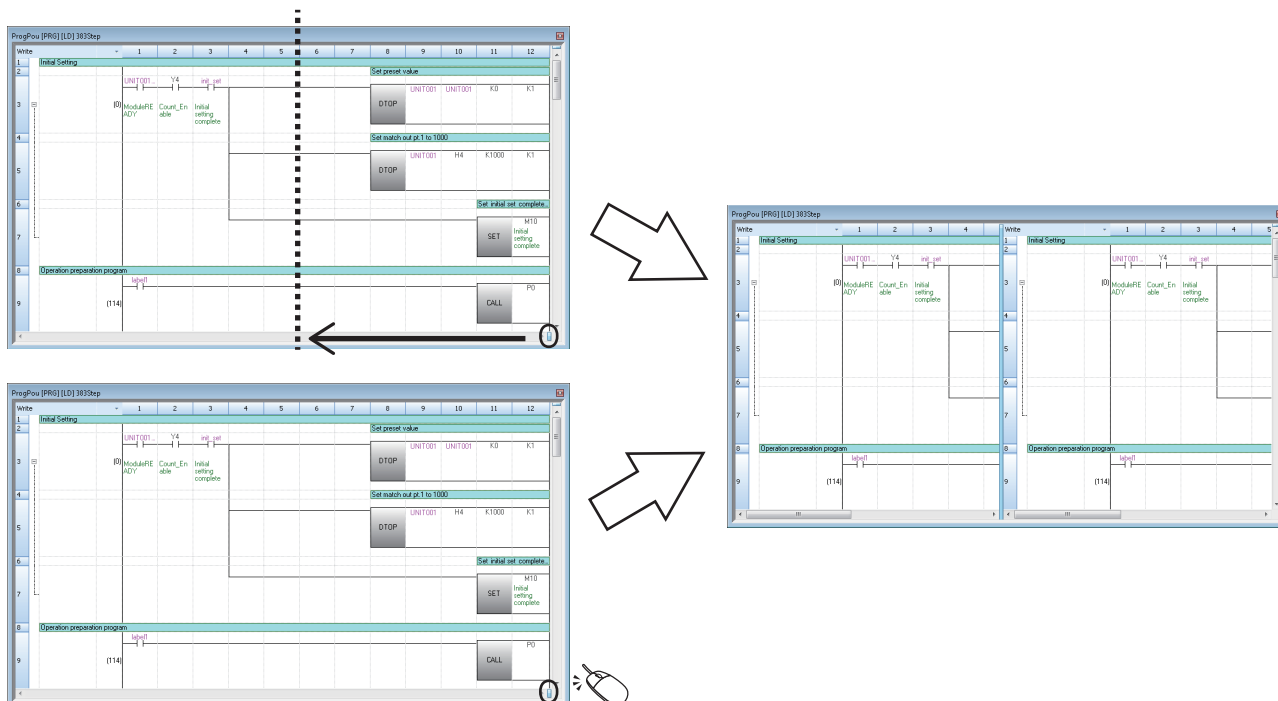
In another way, use the following menu.

- Select [Window] ⇒ [Split].

■Vertical split

Operating procedure

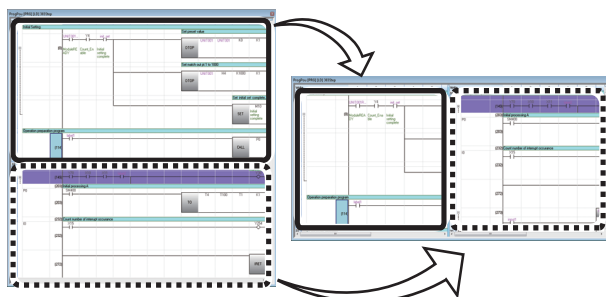
Drag the splitter bar (vertical) to the left or double-click it.



6

Point

Since split ladder editors can be scrolled separately, programs which are described in different parts can be displayed at once.



In addition, editors displayed vertically can synchronously be scrolled by using the following menu.

- [Window] ⇒ [Split Window Operation] ⇒ [Synchronous Scrolling in Side by Side]

Switching the ladder edit mode (read/write/monitor read/monitor write)

The ladder edit mode of a ladder editor (including a Zoom) can be switched by selecting any of the following menus:

| Menu | | Editor where the mode switches |
|-----------------------------|--|--|
| [Edit] ⇒ [Ladder Edit Mode] | ⇒ [Read Mode] | Active ladder editor |
| | ⇒ [Write Mode] | |
| | ⇒ [Read Mode (All Windows)] ^{*1,*2} | All open ladder editors |
| | ⇒ [Write Mode (All Windows)] ^{*2} | |
| | ⇒ [Read Mode (All Ladder Programs Elements)] ^{*1} | All ladder editors that exist in a project |
| | ⇒ [Write Mode (All Ladder Programs Elements)] | |

*1 If there is an unconverted program, the mode will be switched to the read mode while the program remains unconverted.

*2 When the following option is set to "Open Single in Project" or "Open Single in Project," the mode of a Zoom which has been opened even once also switches.

"Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Display Format" ⇒ "Window Display Method"

Point

- The mode can also be changed from the pull-down list for the ladder edit mode, which is in the upper left of a ladder editor.
- When "No" is selected in the following option, a ladder editor can be edited directly same as the write mode in the read mode.

[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Use the Switching Ladder Edit Mode (Read, Write, Monitor, Monitor (Write))"

Precautions

■Read mode/monitor read mode

The program cannot be edited directly when the mode is switched to the read mode or monitor read mode.

However, performing any of the following operations changes the programs.

- The name of source function block is changed or the function block is deleted.
- Input/output labels of source function block are changed and converted.
- Devices/labels are replaced in a batch by specifying the whole project with the replacement function.

To prohibit editing the program, use the security function.

■Monitor write mode

By selecting the checkbox of the following item in the screen which appears when switching to the monitor write mode, whether a program between in GX Works3 and in a programmable controller match can be checked before actually switching the mode.

- Check the consistency between the editing target program file in GX Works3 and the one in PLC.

However, it cannot be checked during a simulation or when a project is logged on as a user whose access level is 'Users.'

(The checkbox of the above item cannot be selected.)

Entering ladders

This section explains the entering method of a ladder.

For details of ladder symbols, refer to the following:


📖 MELSEC iQ-R Programming Manual (Program Design)


📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Inserting contacts, coils, instructions, arguments

Operating procedure

■ Inserting from the element entry dialog











1. Select a cell to add or edit an element, then double-click it or press the  key.

For the insert mode (press the  key to switch to the overwrite mode), instructions are inserted on the cursor position. Therefore, if an instruction is already inserted in the selected cell, the existing instruction will be moved back.

2. Enter an instruction and argument in the element entry dialog.

Point

The following operations are possible in the element entry dialog.

- Moving the cursor on a ladder editor by pressing the  +  /  /  /  keys
- Selecting an instruction/argument in the dialog by pressing the  +  /  keys.
- Displaying options of instructions/labels by pressing the  +  keys.

In addition, by selecting "Yes" for the following option, when entering the description of a device comment, label comment, or instruction, ones for which the data has been set can be displayed as options.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

■ Inserting from the "Enter Ladder" screen with description

1. Click the [Extd Dspl] button in the element entry dialog.
2. Select an instruction and enter an argument in the "Enter Ladder" screen.

Point

A frequently used instruction can be added as a favorite in the "Enter Ladder" screen.

To add an instruction as a favorite, select and right-click the instruction, then select [Add to Favorites] from the shortcut menu.

Instructions added as favorites can be checked by selecting "Favorites" that is at the bottom of the pull-down list of "List."


■ Inserting from the menu or on the toolbar

1. Select a cell to add an element in a ladder editor.
2. Select [Edit] ⇒ [Ladder Symbol] ⇒ [(element)]. Alternatively, select the ladder symbol icon on the toolbar.

■ Inserting from the element selection window

1. Drag and drop a contact, coil, or instruction displayed in the element selection window onto a ladder editor.
2. Edit the argument of each element.

■ Editing arguments directly

Select a cell where an argument is entered, and press the  key.

■Displaying a global label entered by using an assigned device

By entering a device which was assigned as a global label to a program, the global label of the device can be displayed in the program.

Note that, only global labels whose data type is the simple type with no array can be displayed.

Enter an assigned device after changing the entering method by one of the following option, then the global label is displayed.

- [Edit] ⇒ [Edit Mode] ⇒ [Use Assigned Device for Label Input] (🔍)
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Common Item" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Use assigned device for label input"

Point

When inserting an instruction without entering an argument, '?' is set automatically. ('?' can be entered as an argument.)

Arguments can also be entered later.

■Increment/decrement of device number and label number

By pressing the [Alt] + [↑]/[↓] keys, a device number or a label number can be incremented (+1) or decremented (-1.)

The target to increment (+1) or decrement (-1) can be changed by setting the following option.

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Target Device No./Label Name to Increment"

By changing the target for increment or decrement, device names and label names are changed as follows.

| Target | Device number (example) | Label name (example) |
|----------------------------------|-------------------------|-----------------------------|
| Device/Array Element | X0Z0→X1Z0 | bLabel_1[0,0]→bLabel_1[0,1] |
| Device/Label Name | X0Z0→X1Z0 | bLabel_1[0,0]→bLabel_2[0,0] |
| Index Modification/Array Element | X0Z0→X0Z1 | bLabel_1[0,0]→bLabel_1[0,1] |
| Index Modification/Label Name | X0Z0→X0Z1 | bLabel_1[0,0]→bLabel_2[0,0] |

■Switching methods for contacts/instructions

Select a contact/instruction to be switched, and select [Edit] ⇒ [Easy Edit] ⇒ [Switch Ladder Symbol Invert]/[Switch Pulse/Switch SET and RST Instruction] or follow the methods shown below.

| Switching contacts and instructions | Shortcut key | Pull-down list |
|---|--------------|--|
| Switching open/close contact, raising/falling pulse | | <p>Select a symbol from the pull-down list displayed when clicking the blue triangle at the bottom left in the cell.*1</p> |
| Switching operation result rising/falling pulse | | |
| Switching SET/RST instructions | | — |

*1 Whether to enable or disable the ladder editing by mouse operation can be switched by setting the following option.
[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Enable the ladder editing by mouse operation"

Drawing a line

A line can be drawn in the program by the operations shown in the table below.
If a line has already been drawn, the line will be deleted.

| Operation | Drawing a line |
|-----------------------------|--|
| Drag and drop ^{*1} | <div>The diagram illustrates the drag-and-drop method. It shows a ladder logic segment with contacts X0, X1, and X2. A callout box points to a small icon that appears near an element, with the text "Click the icon displayed when the mouse is close to the element." Below this, another callout box points to a line being drawn between contacts, with the text "Drag it until the line is drawn."</div> |
| Keyboard | <div><p> keys</p><p>Press the keys to enter horizontal lines consecutively from a cursor position to the next contact/coil/line connection point.</p></div> |

^{*1} Whether to enable or disable the ladder editing by mouse operation can be switched by setting the following option.
[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Enable the ladder editing by mouse operation"

Inserting a function block

The following shows the procedure for pasting a function block as an element, naming its FB instance name, and inserting it into a sequence program.

For the creation method of a program in a function block, refer to the following:

📖 Page 505 Creating a Function Block

Operating procedure

1. Drag a function block element in the navigation window or element selection window and drop it onto any cell in the sequence program.
2. Select the local label or global label from the pull-down list in the "FB Instance Name" screen, and enter an FB instance name*1.

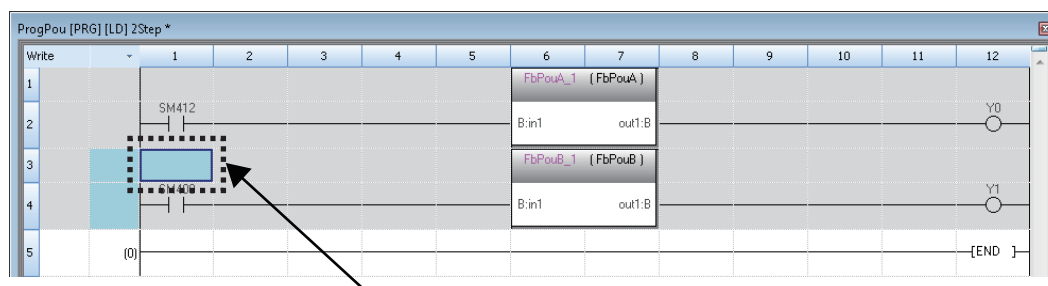
When the function block is pasted, the FB instance name is automatically registered as a label in the selected label setting screen.

3. Connect the input and output to the FB instance.

*1 If the definition name of the function block includes any of the following symbols, the symbol is replaced with an underscore (_): plus sign (+), minus sign (-), exclamation mark (!), left round bracket ((), right round bracket()), or backquote (`).

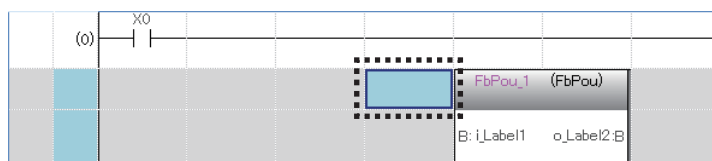
Point

- A function block can also be inserted by entering its FB instance name in the element entry dialog.
- By entering 'fb.' in the element entry dialog, options of function block elements or FB instances are displayed.
- To insert a function block between two consecutive FB instances, select [Edit] ⇒ [Insert Row] above the second FB instance first, and then insert the function block on the inserted row.



Place the cursor in the row on which the second FB instance exists, and insert a row.

- To insert a row above an FB instance, select the cell of a row where the FB instance name is displayed, and select [Edit] ⇒ [Insert Row].



- To insert a row above an FB instance that is connected to an input argument or output argument whose data type is other than BOOL, change the data type of the argument to BOOL and insert a row, then change the data type to the original one.
- By selecting "Yes" for the following option, a column width is automatically adjusted so that the text of an input/output label (argument) does not get cut when inserting a function block:
 - [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Automatically adjust column width in creating"
- By selecting "Yes" for the following option, the "FB Instance Name" screen appears when pasting a function block:
 - [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Show FB Instance Name Window in Pasting Ladder"

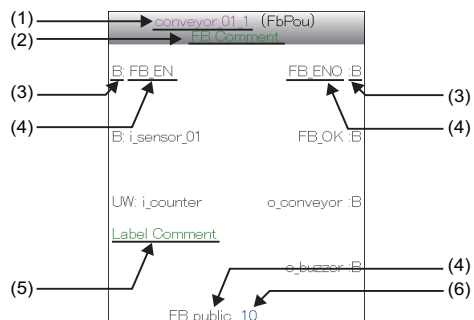
Precautions

Pasting a function block to a sequence program causes the file size to increase.

Pasting the same function blocks to one sequence program repeatedly also causes the size increase of the sequence program in accordance with the number of pasted function blocks.

■Display of an FB instance

The following shows the contents displayed in the pasted FB instance.



- (1): FB instance name
- (2): Label comment of an FB instance or title of a function block
- (3): Data type of an input/output variable
- (4): Label name of an input/output variable
- (5): Label comment of an input/output variable
- (6): Initial value of an input/output variable

Each data type is displayed as follows:

| Data type | |
|-----------|--|
| B | Bit |
| UW | Word [Unsigned]/Bit String [16-bit] |
| UD | Double Word [Unsigned]/Bit String [32-bit] |
| W | Word [Signed] |
| D | Double Word [Signed] |
| E | FLOAT [Single Precision] |
| L | FLOAT [Double Precision] |
| TM | Time |
| S | String |
| US | String [Unicode] |
| DUT | Structure |

Precautions

- The initial values set in a label editor when creating an FB program are displayed. The initial values set to each FB instance are not displayed.
- When both a label comment of an FB instance and a title of a function block are set, the label comment is displayed.

■Changing an FB instance name

Operating procedure

1. Select an FB instance.
2. Select [Edit] ⇒ [Edit FB Instance].
3. Enter a new FB instance name.


Point

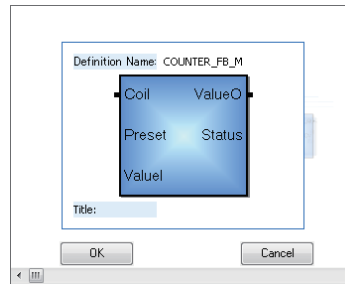
In another way, FB instance names can be changed by any of the following operation.

- Press the **[F2]** key with an FB instance being selected.
- Double-click an FB instance name.

■Replacing an FB instance

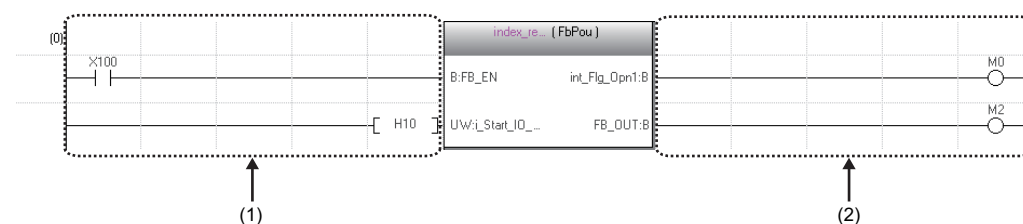
Operating procedure

1. Select an FB instance.
2. Select [Edit] ⇒ [Change FB/FUN Data], or press the  key.
3. Scroll the displayed screen and select the function block to be replaced, and click the [OK] button.



■Creating input and output circuit parts of an FB instance

The following shows the method for creating the input circuits (1) and output circuits (2) of an FB instance pasted to a sequence program.



The number of cells occupied by input circuits or output circuits of an FB instance differs depending on the setting of the following option.

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Display Connection of Ladder Diagram"

| Setting of the number of displayed contacts | Number of cells in input circuit | Number of cells in output circuit |
|---|----------------------------------|-----------------------------------|
| 9 contacts | 4 cells | 4 cells |
| 11 contacts | 5 cells | 5 cells |
| 13 contacts | 6 cells | 6 cells |
| 17 contacts | 8 cells | 8 cells |
| 21 contacts | 10 cells | 10 cells |
| 33 contacts | 16 cells | 16 cells |
| 45 contacts | 22 cells | 22 cells |

Instructions that exceed the number of cells occupied by input circuits or output circuits cannot be entered.

When instructions cannot be placed by changing the number of displayed contacts, the ladder block may not be displayed properly.

Operating procedure

1. Select [Convert] ⇒ [Convert] ().

The ladder block is converted, and lines are connected to the input and output labels of the FB instance.

2. Edit the input circuits.

Enter an element to the input circuit in the same manner as creating normal ladder programs. Create a program in accordance with the data type of input variable.

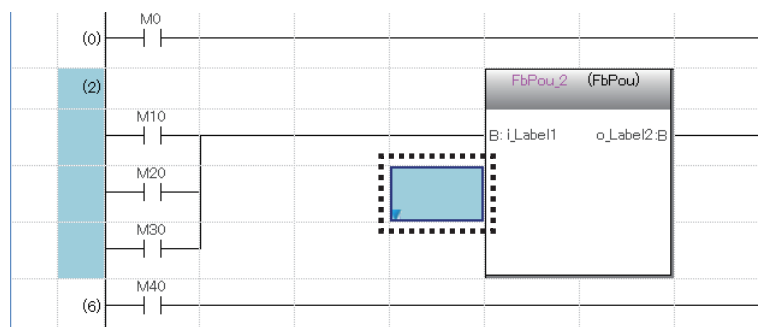
3. Enter elements to the output circuit in the same manner as the input circuit.

Edit the program other than function blocks as well. After complete editing, convert the program.

Point

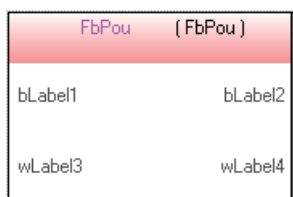
A parallel circuit can be created in an input circuit on an FB instance.

To add an element between a parallel circuits, select a cell under the second row in the input circuit as shown below, and select [Edit] ⇒ [Insert Row] to enter an element in the added row.



■Function block whose definition is unclear

Once the definition of a function block is deleted or changed, the function block is used as one whose definition is unclear and an error occurs when it is converted. The following shows a display example of a function block whose definition is unclear.



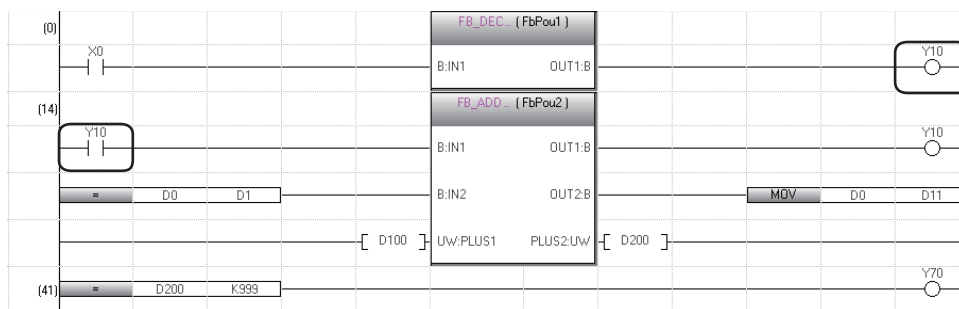
When the definition of a function block is changed, select the function block, then select [Edit] ⇒ [Update FB/FUN] and update the definition information.

When the definition of a function block does not exist, select the function block, then select [Edit] ⇒ [Change FB/FUN Data] and change the data.

■Considerations for using function block

- A single function block can be pasted to a single ladder block.
- The output of an FB instance cannot be directly connected to the input of another FB instance.

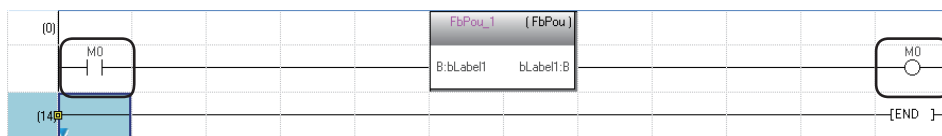
To connect function blocks, use a coil to initially receive the output of a single function block, and then connect the contact of the coil to the input of the other function block.



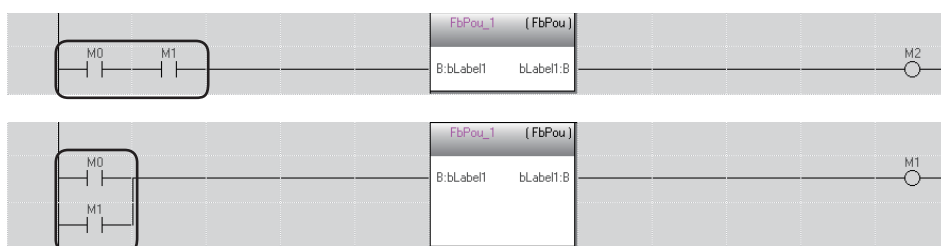
- When the label settings of a function block is changed, convert the program or all programs.

■Considerations for using function block that the class of label is "VAR_IN_OUT"

- If the version of GX Works3 is 1.011M or earlier, use the same device/label for both the input and output which are connected to a "VAR_IN_OUT" class label; otherwise, the program does not operate properly.



- If a project includes a function block that satisfies all the following conditions and if all programs in the project are converted in two different versions of GX Works3 (version 1.011M or earlier and version 1.015R or later), the verification result between the two converted projects will be mismatched. In that case, convert all programs using the same version of GX Works3.
 - The function block is of a subroutine type.
 - Different devices/labels are used for the input and output connected to a "VAR_IN_OUT" label.
- For GX Works3 version 1.015R or later, a conversion error occurs when one or more instructions or coils are set to the left side of "VAR_IN_OUT" of a function block.



■Consideration when an FB instance is connected directly to the left power rail

In the input circuit of an FB instance, if an EN or input variable (bit type) is directly connected to the left power rail, the ON/OFF state will not be changed.

To change the ON/OFF status of an EN and input variable (bit type), use a contact or an instruction equivalent to a contact.

■Displaying/setting FB properties

FB properties can be displayed and set in the "FB Property" window.

For details, refer to the following:

📖 Page 387 Display/setting an FB property

■FB property management (offline)

Initial values of FB properties saved in a project can be exported to a CSV file in the "FB Property Management (Offline)" screen. In addition, the initial values of FB properties can be imported from the CSV file, and the values can be applied to the initial values of FB properties in the project.

For details, refer to the following:

📖 Page 408 FB property management (offline)

Inserting a function

The following shows the procedure for inserting a function in a ladder program.

For the creation method of a function, refer to the following:

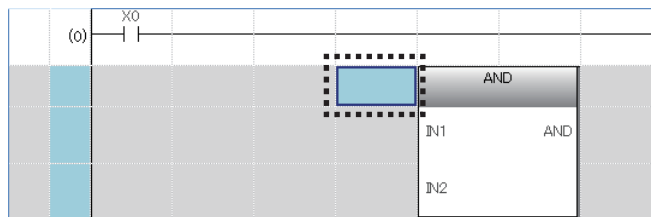
📖 Page 525 Creating a Function

Operating procedure

1. Drag a function element in the navigation window or element selection window and drop it onto any cell in the sequence program.
2. Connect an input and an output to the function.

Point

- By entering 'fun.' in the element entry dialog, the options of function elements are displayed. A function element can be entered by selecting it from the options.
- To insert a row above a function, select the cell of a row where the function name is displayed, and select [Edit] ⇒ [Insert Row].



- To insert a row above a function that is connected to an input argument or output argument whose data type is other than BOOL, change the data type of the argument to BOOL and insert a row, then change the data type to the original one.
- By selecting "Yes" for the following option, a column width is automatically adjusted so that the text of an input/output label (argument) does not get cut when inserting a function:
· [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Automatically adjust column width in creating"

■ Adding/deleting arguments

Only for a function of which the number of arguments can be changed, an argument can be added/deleted.

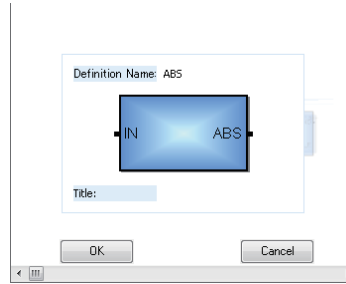
Operating procedure

1. Move the cursor on a function.
2. Select [Edit] ⇒ [I/O Argument] ⇒ [Increment Argument] (🔍)/[Delete Argument] (🗑️).

■Replacing functions

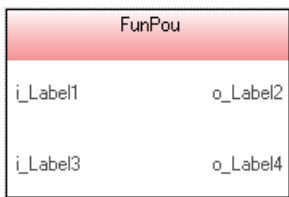
Operating procedure

1. Move the cursor on a function.
2. Select [Edit] ⇒ [Change FB/FUN Data].
3. Scroll the screen and select the function block to be replaced, and click the [OK] button.



■Function whose definition is unclear

Once the definition of a function is deleted or changed, the function is used as one whose definition is unclear and an error occurs when it is converted. The following shows a display example of a function whose definition is unclear.



When the definition of a function is changed, select the function, then select [Edit] ⇒ [Update FB/FUN] and update the definition information.

When the definition of a function does not exist, select the function, then select [Edit] ⇒ [Change FB/FUN Data] and change the data.

Inserting an inline structured text box

Inline structured text is a function to edit or monitor an ST program by creating an inline structured text box, which displays an ST program, at the coil instruction area in a ladder editor.

With this function, a numeric value operation or a character string process can be created easily in the ladder program.


Note that this function cannot be used in a safety program and a safety FB/FUN.

In this manual, the ST program in an inline structured text box is referred to as an 'inline structured text program.'

Up to 20,000 characters can be entered in an inline structured text program. (A line feed is counted as two characters.)

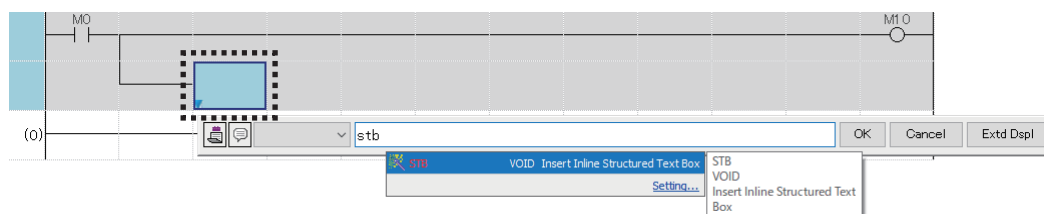
Operating procedure

Select [Edit] ⇒ [Inline Structured Text] ⇒ [Insert Inline Structured Text Box] ().

The editing method of the inline structured text program is the same as that of ST program. ( Page 323 Entering programs)

Point

- Enter 'STB' on the element entry dialog to insert an inline structured text box.
- When inserting an inline structured text box as a parallel circuit, draw lines for the parallel circuit first, and then insert an inline structured text box.



Precautions

- Of the FB instance, function, and inline structured text box, only one can be placed in a single row.
- An inline structured text box cannot be connected to the input and output circuit parts of an FB instance or a function.
- The label of which data type is pointer cannot be used in the inline structured text program.
- When a row including an inline structured text box is deleted, the whole ladder block is deleted.
- When inserting an inline structured text box in a wrapping destination ladder, a jump destination of an error message may be the top of a ladder block if a conversion error occurs in inline structured text.

Instructions which do not run properly in an inline structured text program

The following instructions may not run properly in an inline structured text program.

| Instruction | |
|-------------------------|--|
| Contact instruction | LDP, LDF, ANDP, ANDF, ORP, ORF, LDPI, LDFI, ANDPI, ANDFI, ORPI, ORFI |
| Association instruction | MEP, MEF, EGP, EGF |
| Output instruction | OUT, OUTH, SET F, RST F, PLS, PLF, FF |
| Instruction with 'P' | □P (such as INCP and MOV P), SP.□, ZP.□, GP.□, JP.□, DP.□, MP.□ |
| Other instructions | UDCNT1, UDCNT2, TTMR, STMR, RAMPQ, SPD, PLSY, PWM, MTR, SORTD(_U), DSORTD(_U), LEDR, DUTY, LOGTRG, LOGTRGR, TIMCHK, HOURM, DHOURM, PID, XCALL, SCJ |

■ Changing the number of rows to display

The height of an inline structured text box depends on the number of rows to display.

The following shows the procedure to change the number of rows to display.

Operating procedure

1. Select an inline structured text box or a row including the inline structured text box. (Multiple selections allowed.)
2. Select [View] ⇒ [Height Setting of Inline Structured Text].
The "Height Setting of Inline Structured Text" screen appears.
3. Set each item and click the [OK] button.

Point

- By selecting "Yes" for the following option, the height of an inline structured text box is automatically adjusted for each line feed.
· [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Inline Structured Text" ⇒ "Operational Setting" ⇒ Automatically Adjust Inline Structured Text Height
- The "Height Setting of Inline Structured Text" screen appears also by selecting [Height Setting of Inline Structured Text] from the shortcut menu after right-clicking on an inline structured text box or a ladder editor.

Precautions

- Once the number of rows to display in an inline structured text box is changed, the following menu is not available to turn the number back to the previous setting:
· [Edit] ⇒ [Undo]/[Redo]
Use the "Height Setting of Inline Structured Text" screen to change it.
- The number of rows to display may not be changed if the cell height of the contact of an inline structured text is taller than the one of the inline structured text box.

Ex.

The following lists examples of option settings which affect the cell height of a contact:

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Display Format" ⇒ "Row"
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Number of Wrapping Rows for Device/Label Name"
- [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Ladder Editor" ⇒ "Display Setting" ⇒ "Display Lines for Monitoring Current Value"

Pasting from each screen


A device/label can be pasted by dragging and dropping its name from each screen such as a label editor, "Label Comment" window, and device comment editor.

By dragging and dropping a device/label onto a blank cell, a contact is inserted automatically and its device/label name is displayed.

When dropping onto the right end of the cell, a coil is inserted automatically and its device/label name is displayed.

Additionally, a device/label can be pasted by dragging and dropping onto the argument of an instruction.

Registering an undefined label

When entering an undefined label, the "Undefined Label Registration" screen appears and the label can be registered in a label editor. ( Page 257 Registering an undefined label)


Checking the duplicated coils

When entering a coil in a program, whether coils are duplicated in the same program can be checked.

Whether to check the duplication can be set by setting the following option.

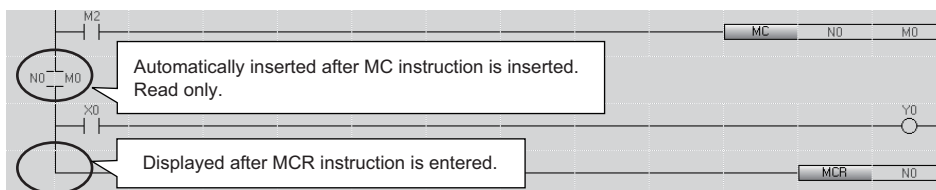
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter Ladder" ⇒ "Operational Setting"

For the check target instructions/devices of duplicated coils, refer to the following:

 Page 430 Target of duplicated coil check

Displaying MC/MCR instructions

When the MC instruction is inserted to a ladder program, the double-line symbol is displayed on the left vertical line. As for MCR instruction, the left vertical line is delimited.



Entering comments/statements/notes

This section explains the basic operations for editing comments, statements, and notes.

Entering/editing comments


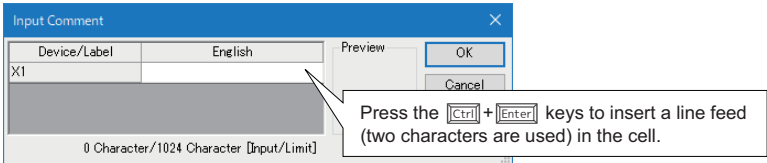


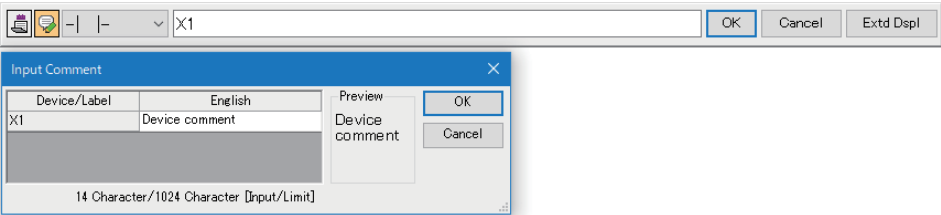



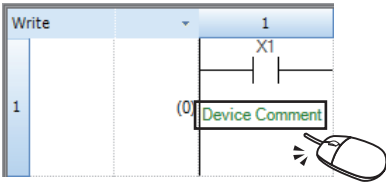
A device/label comment can be entered and edited by the methods shown in the table below.

The display status of the comments can be switched in the following menu:

- [View] ⇒ [Comment Display]/[Comment/Statement/Note Batch Display]

The device comments edited or added on a ladder editor are applied to the device comments set to the following option.

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target"

| Entering/editing method | Operating procedure |
|-------------------------------|--|
| In the "Input Comment" screen | <div>1. Select [Edit] ⇒ [Documentation] ⇒ [Edit Device/Label Comment] ().</div> <div>2. Select the cell and press the [Enter] key or double-click it.</div> <div>3. Enter a comment in the comment column.</div> <div></div> <div>After entering comments is completed, select [Edit] ⇒ [Documentation] ⇒ [Edit Device/Label Comment] () again.</div> |
| On the element entry dialog | <div>1. Select a cell and press the [Enter] key.</div> <div>2. Click  on the element entry dialog and click the [OK] button.</div> <div>3. Enter a comment in the comment column in the "Input Comment" screen.</div> <div></div> |
| With the keyboard | <div>1. Display the comments.</div> <div>2. Select the cell and press the [F2] key twice.</div> <div>3. Enter a comment directly.</div> |
| From each editor | <ul style="list-style-type: none">• Label editor:  Page 235 Configuration of a label editor• "Label Comment" window:  Page 253 Setting a label comment• Device comment editor:  Page 415 Creating device comments |
| With the mouse | <div>1. Double-click a comment.</div> <div>2. Enter the comment directly.</div> <div></div> |

Entering/editing statements

Add a comment to a ladder block using the statement (line statement, P statement, or I statement) in order to make the processing flow easy to understand.



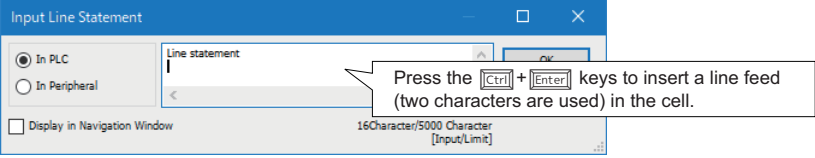




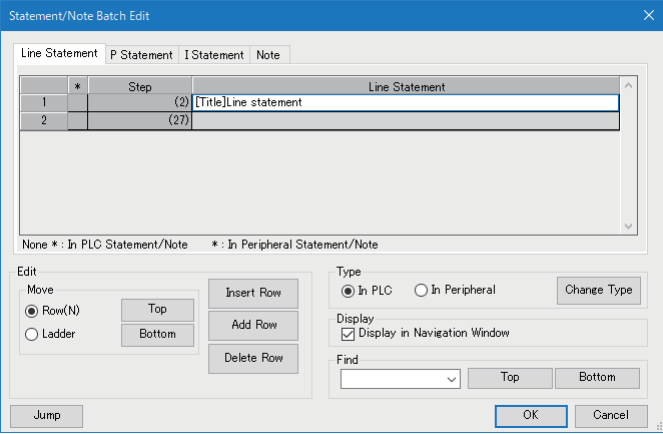

The display status of the statements can be switched in the following menu:

- [View] ⇒ [Statement Display]/[Comment/Statement/Note Batch Display]

For details on the statements, refer to the following:

MELSEC iQ-R Programming Manual (Program Design)

MELSEC iQ-F FX5 Programming Manual (Program Design)

| Entering/editing method | Operating procedure |
|---|---|
| In the Enter Statement screen | <div>1. Select [Edit] ⇒ [Documentation] ⇒ [Edit Statement] ().</div> <div>2. Select the cell and press the  key or double-click it.</div> <div>3. Enter a statement.</div> <div>Before entering P statement/I statement, select the cell of a pointer number or interrupt pointer number.</div> <div></div> <div>When "Display in Navigation Window" is selected, "[Title]" is added in front of the line statement.</div> <div>After entering statements is completed, select [Edit] ⇒ [Documentation] ⇒ [Edit Statement] () again.</div> |
| On the element entry dialog | <div>1. Select a cell and press the  key.</div> <div>2. Enter a statement after entering ';' for 'In PLC' and ';;' for 'In Peripheral.'</div> <div>When displaying a statement in the navigation window, enter [Title] after ';' or ';;'.</div> <div>For P statement/I statement, enter a statement following the entry of the displayed pointer number or interrupt pointer number.</div> <div></div> |
| In the "Statement/Note Batch Edit" screen | <div>1. Select [Edit] ⇒ [Documentation] ⇒ [Statement/Note Batch Edit] ().</div> <div>2. Enter a statement.</div> <div></div> <div>[Insert Row] button: Inserts a row above the cursor position.</div> <div>[Add Row] button: Inserts a row below the cursor position.</div> |
| With the keyboard | <div>1. Select the cell of a statement, and press the  key.</div> <div>2. Enter a statement directly.</div> |

Precautions

';' cannot be prefixed to a line statement.

■Editing statements

After editing a statement, the same as when a ladder program is edited, the program will be in unconverted state.

If any statement is edited in an FB program body or FUN program body, a program part where the edited function block or function is used may also be in unconverted state.

For details on the conversion of a function block or function, refer to the following:

☞ Page 508 Converting function blocks

☞ Page 526 Converting functions

■Displaying a list

Line statements used in a ladder program are displayed in a list format.


The cursor jumps from the list to a location where the selected line statement is used.

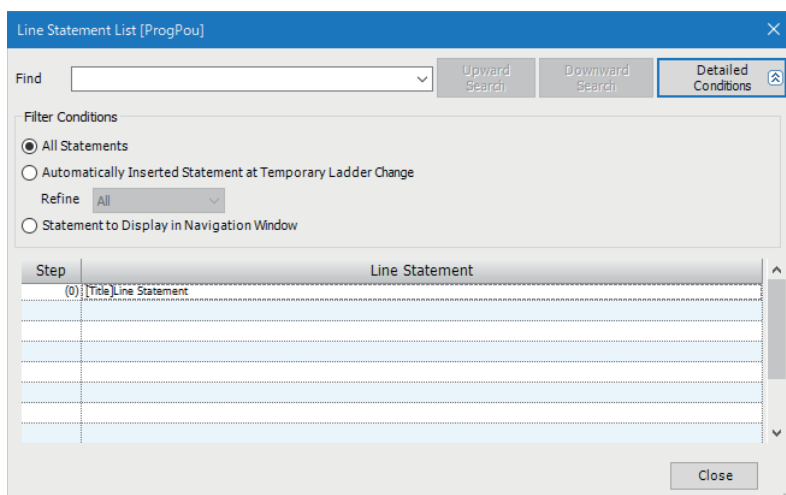
Only line statements inserted automatically with temporary ladder change can be displayed.

For details on temporary ladder change, refer to the following:

☞ Page 304 Changing ladder blocks temporarily

Window

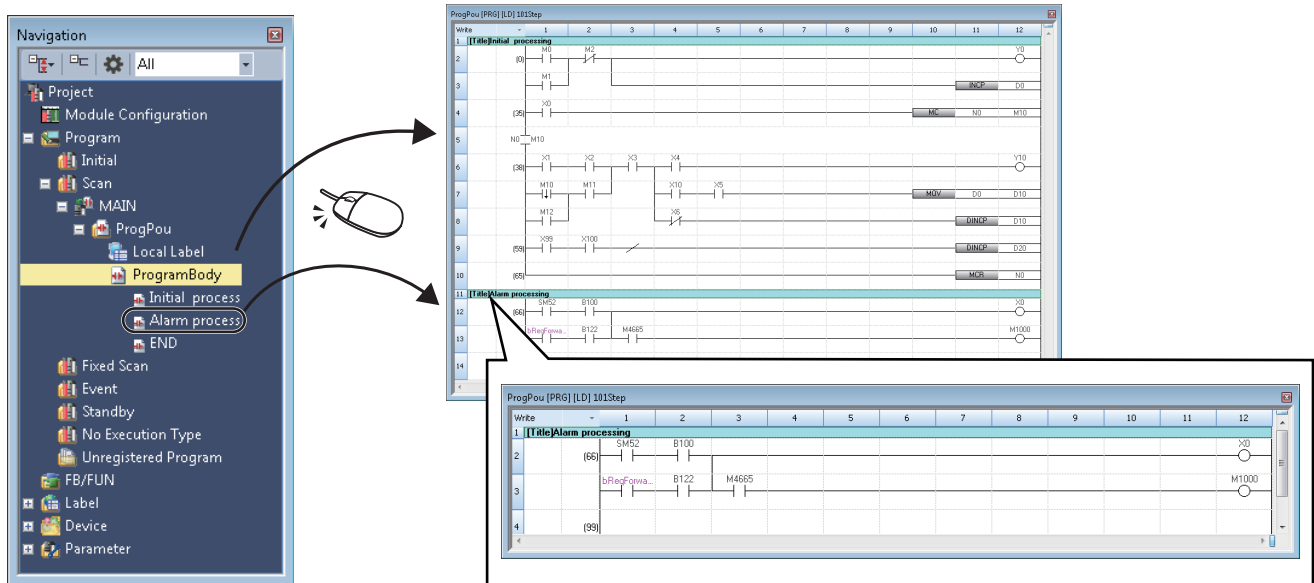
Select [Find/Replace] ⇨ [Line Statement List] ().



■Line statement to be displayed in the navigation window

It can be switched to show or hide a line statement in the navigation window by specifying the line statement and selecting [Edit] ⇒ [Documentation] ⇒ [Hide of Navigation Window].

By double-clicking a line statement in the navigation window, only corresponding ladder blocks can be displayed.



Precautions

By double-clicking a line statement in the navigation window when all of the following conditions are satisfied, the cursor jumps to the head of the corresponding block while displaying the whole program.

(Displaying only corresponding ladder blocks is not applicable.)

- A ladder editor is vertically split into two screens.
- The menu [Window] ⇒ [Split Window Operation] ⇒ [Synchronous Scrolling in Side by Side] is not selected.

When copying or deleting a line statement displayed in the navigation window, the ladder blocks between the selected line statement and the next statement are copied or deleted.

Entering/editing notes

Append a comment to coils/application instructions using Note in the program in order to make it easier to understand the content of program.

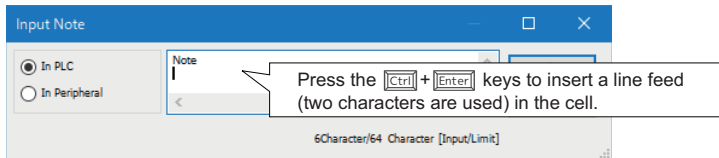
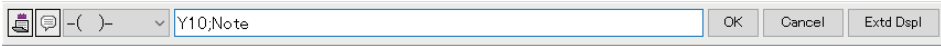
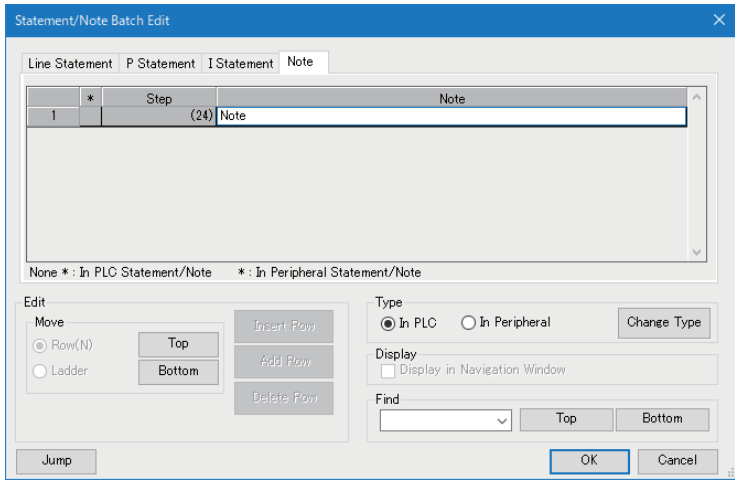
The display status of the notes can be switched in the following menu:

- [View] ⇒ [Note Display]/[Comment/Statement/Note Batch Display]

For details on the notes, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

| Entering/editing method | Operating procedure |
|---|--|
| In the "Enter Note" screen | <ol style="list-style-type: none"> 1. Select [Edit] ⇒ [Documentation] ⇒ [Edit Note] (📝). 2. Select the cell and press the [Enter] key or double-click it. 3. Enter a note.  <p>After entering notes is completed, select [Edit] ⇒ [Documentation] ⇒ [Edit Note] (📝) again.</p> |
| On the element entry dialog | <ol style="list-style-type: none"> 1. Press the [Enter] key. 2. Enter notes following the displayed device/instruction after entering ';' for 'In PLC' and ';' for 'In Peripheral.'  |
| In the "Statement/Note Batch Edit" screen | <ol style="list-style-type: none"> 1. Select [Edit] ⇒ [Documentation] ⇒ [Statement/Note Batch Edit] (📝). 2. Enter a note.  |
| With the keyboard | <ol style="list-style-type: none"> 1. Select the cell of a note, and press the [F2] key. 2. Enter a note directly. |

■Edit

After editing a note, the same as when a ladder program is edited, the program will be in unconverted state.

If any note is edited in an FB program or FUN program, a POU where the edited function block or function is used may also be in unconverted state.

For details on the conversion of a function block or function, refer to the following:

📖 Page 508 Converting function blocks

📖 Page 526 Converting functions

Inserting/deleting NOP instruction

Insert or delete a NOP instruction to adjust Step No. of a program.

The Step No. changed by the NOP instruction is applied to a ladder editor after converting the program.

Operating procedure

■Batch insertion

1. Select a cell to be insert.
2. Select [Edit] ⇒ [NOP Batch Insert].
3. Set the number of NOPs in the "NOP Batch Insert" screen and click the [OK] button.

■Batch deletion

Select [Edit] ⇒ [NOP Batch Delete].

Changing TC setting values

The setting value of a timer and a counter used in a ladder program can be changed in a batch.

When a setting value is changed, the program will be in the unconverted state.

By selecting the checkbox of "Write the Changed Program to PLC," the online program change is performed after changing a setting value.

An inline structured text of a ladder program is not supported.

Window

Select [Edit] ⇒ [Change TC Setting Value].

| Position | Device/Label | Setting Value before Change | Setting Value after Change |
|----------|--------------|-----------------------------|----------------------------|
| (1) T0 | | K200 | |
| (6) T1 | | K100 | |
| (11) T2 | | K100 | |

Operating procedure

1. Set the items in the screen.

When performing the online program change after changing the setting value, select the checkbox of "Write the Changed Program to PLC."

2. Click the [Execute] button.

Precautions

■When an error occurs during the online program change

The TC setting value of a program is changed but it is not written to a programmable controller.

■When specifying "MELSAP-L (Instruction Format)" for the display format of an SFC program

The TC setting value of an SFC (Zoom) cannot be changed in the following settings:

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Display Format" ⇒ "Ladder Display Method"
- [View] ⇒ [Switch Ladder Display]

Targets for changing TC setting values

■Target instruction

The following shows the instructions that can be set in the "Change TC Setting Value" screen.

- OUT: Timer/retentive timer output, long timer/long retentive timer output, counter/long counter output
- OUTH: High-speed timer/high-speed retentive timer
- OUTHS: High-speed timer/high-speed retentive timer^{*1}

^{*1} RCPUs do not support it.

■Target device

The following table shows the devices that can be set in the "Change TC Setting Value" screen.

| Instruction argument | Device | Global device | Local device |
|-------------------------------|---|-----------------------|-----------------------|
| Timer/counter/retentive timer | T, ST, LT, LST, C, LC, SA\T, SA\ST, SA\C | <input type="radio"/> | <input type="radio"/> |
| Setting value | D, SD, W, SW, J□\W, J□\SW, U□\G, U3E□\G, U3E□\HG, RD, R, ZR, K, FD, SA\D, SA\SD, SA\W | <input type="radio"/> | <input type="radio"/> |

Copying and pasting a ladder


Cutting/coping

Select an instruction, range, or ladder block, and cut/copy it.

Select a row when copying a function/function block.

Pasting

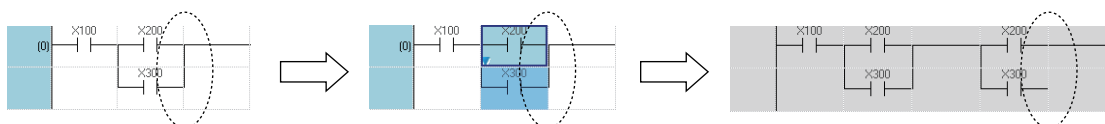
Paste a cut/copied ladder.

For the insert mode (press the  key to switch to the overwrite mode), one row will be inserted above the line where the cursor is placed over and the copied ladder will be pasted.

Even in the overwrite mode, a row/column will be inserted automatically and the copied ladder will be pasted by selecting [Edit] ⇒ [Insert and Paste].

Precautions

If the range to cut/copy is selected on a ladder as shown below, the vertical line on the right side cannot be pasted.



In this case, draw a vertical line after the pasting.

Pasting device numbers or label names consecutively

Paste device numbers or label names that exist in the cut/copied ladder consecutively while incrementing the numbers (+1). The menu [Edit] ⇒ [Continuous Paste] is not available for pasting device names and label names onto the input and output circuit parts of a function/function block.

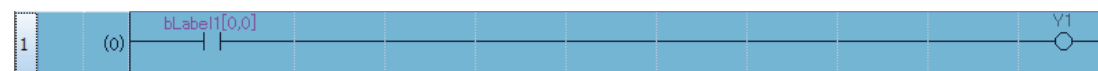
This section shows the operating procedure to paste labels consecutively by using the example of the following program.



- Label name: bLabel1[0,0]
- Data type: Bit (0..3,0..3)

Operating procedure

1. Select an instruction or ladder block to be pasted continuously, and cut or copy it.



2. Move the cursor to the start position of the continuous paste, and select [Edit] ⇒ [Continuous Paste].
3. In the "Continuous Paste" screen, set each item and click the [Execute] button.

The "Continuous Paste" dialog box is shown. It contains the following settings:

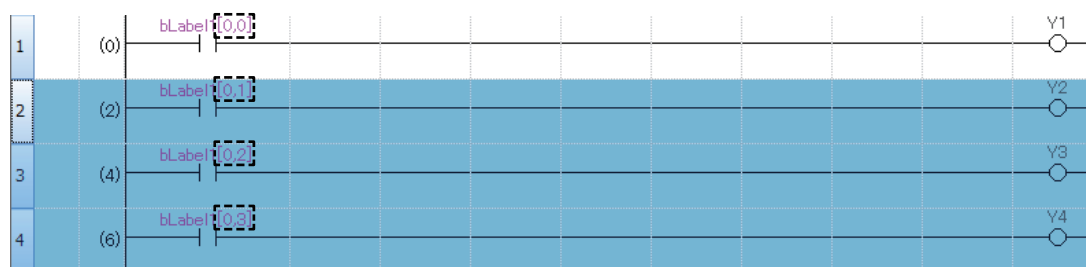
- Number of Continuous Pastings (1 to 99): 3
- Increment Position of Label Name: "value at the end (bLabel1 >> bLabel1_1)"
- ☐ Display Comment
- Increment Value Batch Setting: (button)

| Type | Copy Source | After Increment | Increment Value |
|-------------|--------------|-----------------|-----------------|
| Local Label | bLabel1[0,0] | >> bLabel1[0,1] | |
| Local Label | bLabel1 | >> bLabel1 | 0 |
| | 0 | >> 0 | 0 |
| | 0 | >> 1 | 1 |
| Device | Y1 | >> Y2 | 1 |

Below the table, there are checkboxes for "Edit additional information of the labels registered in label editor after registering label information" and "Register a label at the last row". At the bottom, there is a "Pasting Direction" dropdown set to "Down" and "Execute" and "Cancel" buttons.

- Number of Continuous Pastings: 3
- Increment Value: 1
- Pasting Direction: Down

The instruction or ladder block can be pasted continuously.



Precautions

The following data cannot be incremented.

- The number of digits of digit-specified bit device
- Dummy device
- Local label used in a function block
- Structure member
- Some constant (boolean value, real number, character string, time)
- Wrapping symbol
- EN/ENO of a function block or function
- Return value of a function

Returning ladder diagrams to the condition before editing

A ladder diagram being edited can return to the condition before starting editing.

Among the following operations, it returns to the operation that was performed just before editing the program.

- Opening a project
- Overwriting a project or saving a project with a new name
- Deleting a label
- Closing the ladder editor
- Converting a program
- Copying data

Operating procedure

Select [Edit] ⇨ [Set the Status Back to the One at the Start of Editing].

Changing ladder blocks temporarily

The operation of a specific ladder block can temporarily be changed.

Using the Temporarily Change Ladders function, the program for debugging can be changed without losing the source program, therefore the debug process will be improved efficiently.

This function can be used only for a standard program created in Ladder Diagram language (excluding a Zoom).


FX5CPUs do not support this function.

Precautions

When opening a project, that contains a temporarily changed ladder program, in GX Works3 Version 1.008J or earlier, the background color of disabled ladder block is not changed. Besides, 'Apply the Changes' and 'Restore the Changes' cannot be performed.

Temporary changing

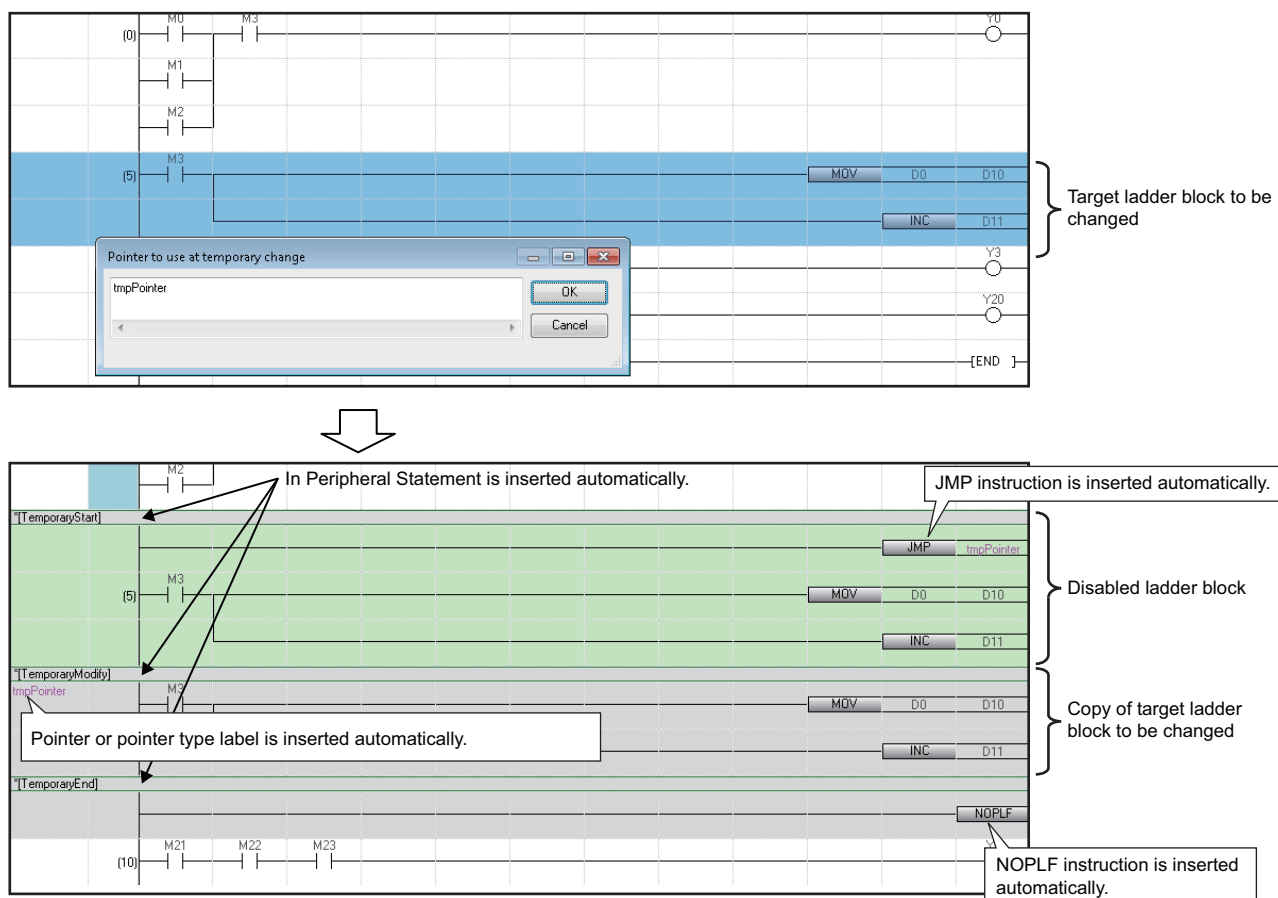
Operating procedure

1. Select the ladder block to change, then select [Edit] ⇒ [Temporarily Change Ladders] ⇒ [Temporarily Change Ladders] ().

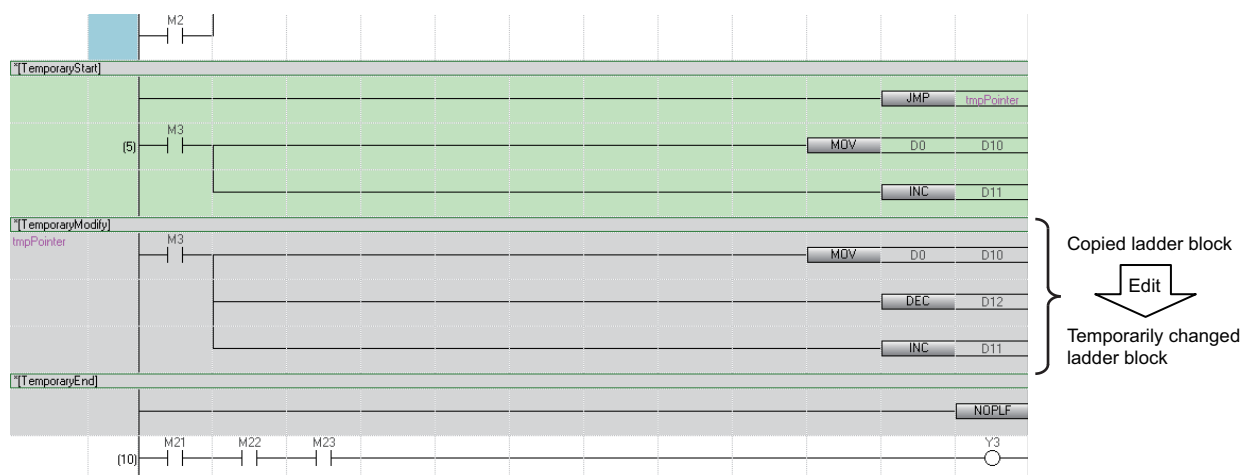
2. Enter a pointer or pointer type label to be used.

A peripheral statement, JMP instruction, NOPLF instruction, or pointer device (or pointer type label) is automatically inserted as shown below.

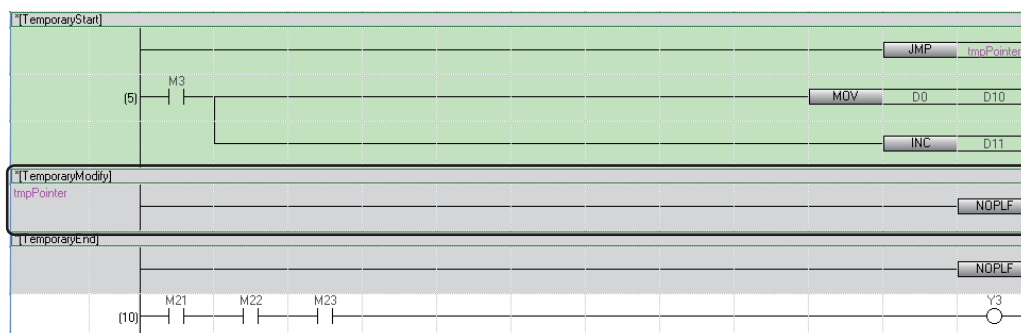
The selected ladder block is disabled and a copy of the selected ladder blocks is inserted immediately below the disabled ladder block.



3. Edit the copied ladder block.



By changing the copied ladder block to the NOPLF instruction, the specified ladder block is disabled temporarily.



6

Precautions

In a program of function/function block, a pointer device cannot be used temporarily. Only pointer type label is applicable.

Applying/restoring the changes

The changed ladder program is applied if no problem is found with the operation. If any problems are found, the change is restored.

Operating procedure

Select the ladder block from [TemporaryStart] statement to [TemporaryEnd] statement, and then select [Edit] ⇒ [Temporarily Change Ladders] ⇒ [Apply the Changes] ()/[Restore the Changes] ().

Displaying ladder blocks changed temporarily in a list

The list of ladders changed temporarily can be displayed on the active ladder editor.

Operating procedure

Select [Edit] ⇒ [Temporarily Change Ladders] ⇒ [Temporarily Changed Ladder List] ().

Only the statements inserted automatically by changing a ladder block temporarily are displayed in the "Line Statement List" screen.

Considerations for editing ladder blocks changed temporarily

When the temporarily changed ladder block was edited with the contents listed in the following table, the program may not be performed normally.

| Description | |
|--------------------------|--|
| Statement | Delete/cut a statement. |
| | Insert a ladder block between the [TemporaryModify] statement row and the ladder block changed temporarily (which is the row setting a pointer). |
| | Delete the [TemporaryEnd] statement row and NOPLF instruction. |
| | Insert a ladder block/a statement/NOPLF instruction between the [TemporaryEnd] statement row and NOPLF instruction. |
| | Insert a statement before and after the [TemporaryStart] statement row. |
| JMP instruction, Pointer | Edit/delete a JMP instruction or a pointer. |
| Ladder block | Edit a disabled ladder block. |
| | Delete a ladder block disabled/changed temporarily. |
| | Copy and paste a ladder block disabled/changed temporarily. |

Searching for/replacing data in a program


The search functions that can be used in a ladder editor are as follows.

| Function name | Description | Reference |
|------------------|---|-----------------------------|
| Simple search | To search for instructions, devices, labels, statements, and notes. | Page 306 Simple search |
| Jump | To move the cursor onto a specified step No. | Page 307 Jump |
| Cross reference | To check a declaration location and a reference location of a device and a label in a list. | Page 460 SEARCHING FOR DATA |
| Device list | To check the usage of devices being used. | |
| Find and replace | <ul style="list-style-type: none">To search for and replace a device name, label name, instruction name, and character string.To change contacts between open contact and close contactTo replace devices in a batch. | |

Simple search

Instructions, devices, labels, statements, and notes can be searched for by entering a text in the "Find" screen.

Operating procedure

1. Press the  key on a ladder editor.
2. Enter a text, and click the [Find] button in the "Find" screen.

Point

By using the following menu, the cursor jumps forward or backward from the current position to the positions where search was applied.

- [Find/Replace] ⇨ [Previous] /[Next] 

Search options

A search option can be set by adding the following commands at the end of a text for search.

| Command | Item name in the find/replace window | Description |
|----------------------------|--------------------------------------|--|
| /K (Example: M0/K) | Digit | The entered device and digit-specified bit devices that include the entered device are searched for. |
| /D (Example: D0/D) | Multiple Word | The entered device and the double-word format word devices that include the entered device are searched for. |
| ; (Example: ;statement) | — | Statements or notes are searched for. |

For the device search examples using a search option, refer to the following:

 Page 464 Examples of device search

Jump

The cursor jumps on a ladder editor by specifying a step number.

Operating procedure

1. Select [Find/Replace] ⇒ [Jump].
2. Specify a Step No. in the "Jump" screen, and click the [OK] button.

Point

On a ladder editor, pressing a numeric key on the keyboard enables to display the "Jump" screen.

By using the following menu, the cursor jumps forward or backward from the current position to the positions where search was applied.

- [Find/Replace] ⇒ [Previous] (🔍) / [Next] (🔍)

Displaying instruction help

The instructions used in a ladder program can be checked in e-Manual Viewer.

To check the instructions, the file of the corresponding manual must be registered in e-Manual Viewer.

Operating procedure

1. Select the cell where the target instruction is entered.
2. Press the **[F1]** key.

Point

If a help file is associated with a function or function block, the help file opens. (📖 Page 141 Associating data with a help file)

Copying an image to the clipboard

The range selected in a ladder editor can be copied to the clipboard as an image by using the image clip function.

The following shows the procedure to copy a ladder program to the clipboard.

Operating procedure

1. Select a range to be copied in a ladder editor.
2. Select [Edit] ⇒ [Image Clip].

When selecting cells, only the selected range is copied.

When selecting rows, the range including the row headers and column headers is copied.

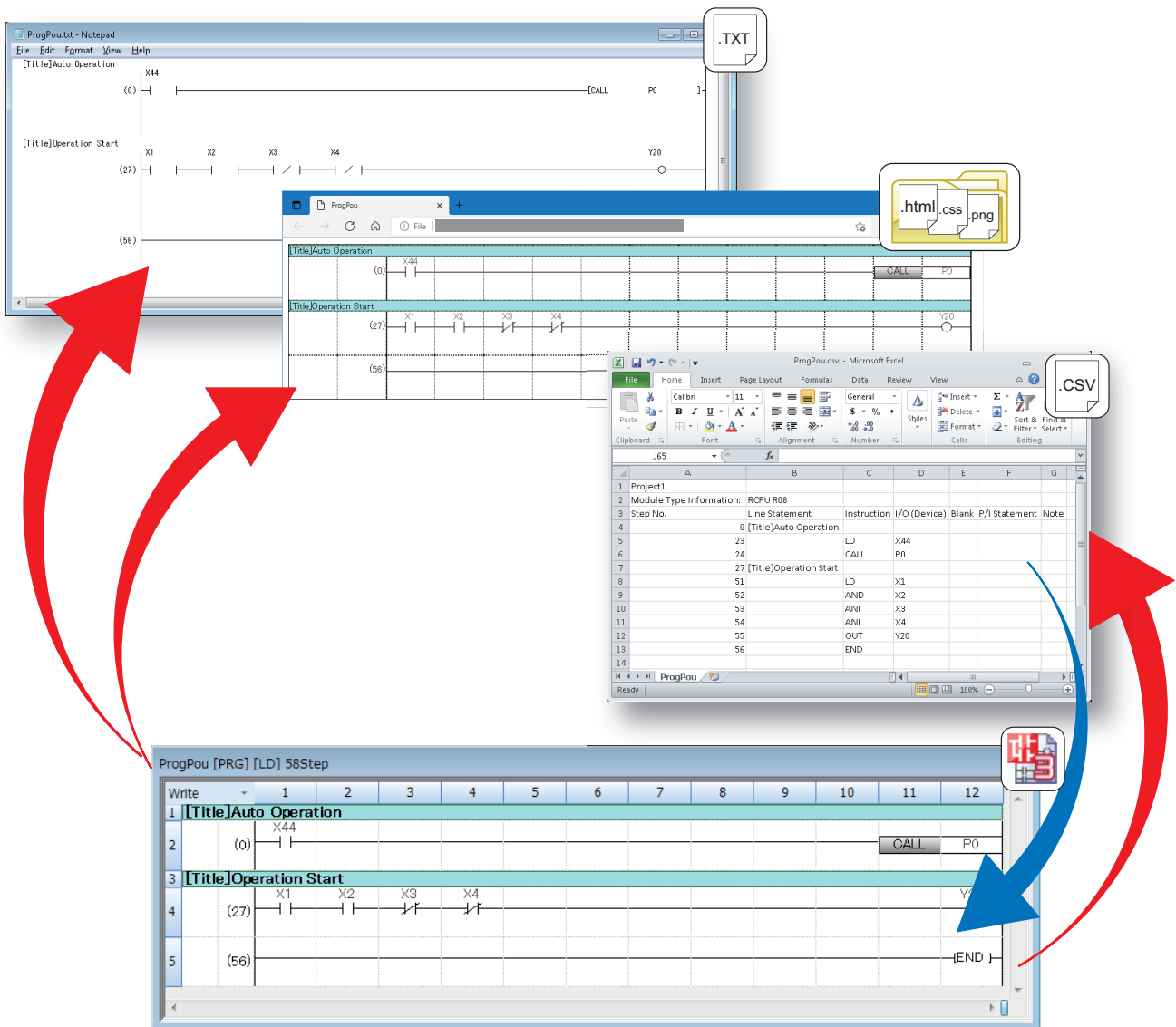
Precautions

Up to 80 rows of ladders can be copied as an image to the clipboard.

However, ladders may not be copied correctly if the image size exceeds 15 MB.

Importing/exporting ladder programs

A ladder program can be imported from a CSV file and exported to a CSV file, HTML file, or text file.




Importing from a CSV file

Listed instructions in a CSV file can be imported into a ladder program.

When importing from the CSV file, the program will be in the unconverted state.

Operating procedure

1. Open a ladder editor, and select [Edit] ⇒ [Import File]().
2. Select a file to import in the "Import File" screen.
3. Specify "CSV (tab delimited)(*.csv)" for the file type, and click the [Open] button.
4. Select "Convert to 'OUT SM4095'" or "Convert to line statement" for "Conversion Method for Incorrect Instruction" in the screen to confirm import, and click the [Yes] button.

Precautions

- When a program is being monitored or simulated, a file cannot be imported.
- When an import destination satisfies any of the following condition, the program needs to be converted (reassigned) after importing a file.
 - There are multiple programs in the program file.
 - The program is the one of function blocks or functions.
- When a label of 'VAR' class of an FB instance is included in a CSV file, a conversion error occurs after import.

■ Restrictions on data to be imported

The following restrictions apply to data to be imported.

- Data in the eighth column or later in a CSV file is not imported.
- When a language of data to be imported is different from that of a project, some characters may be garbled.
- When data is imported, the existing program in the import destination is deleted.

■ Import of a program in which a function block or function is used

When importing a program including a function block or function, the function block, function, and FB instance are imported as undefined elements.

■ Import of a program in version 1.038Q or earlier



In version 1.038Q or earlier, an error occurs when importing a program including the following elements from a CSV file.

Import a program in version 1.040S or later.

- Label
- Inline structured text
- Function block and function

■File format

For the file formats when importing, follow the formats listed below:

| Item | Format | Example | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|-------------|--------------|--------|---------------|------|--|--|--|--------------------------|---|----------|--------|--|---------|------|-----|----------|------|-----------|-------------|--------------|---------|---------------|------|----|--|-------------|-------|--|--|--|-----|----|--|--------|------------|--|--|--|-----|----|----------|--------|--|--|--|--|----|--|-------|--|--|--|--|
| Header | A project name and a module type are displayed. The header of each column is also displayed. | <table><tr><td colspan="2">Project1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td colspan="2">Module Type Information:</td><td colspan="6">RCPU R08</td></tr><tr><td>Step No.</td><td>Line</td><td>Statement</td><td>Instruction</td><td>I/O (Device)</td><td>Blank</td><td>P/I Statement</td><td>Note</td></tr></table> | Project1 | | | | | | | | Module Type Information: | | RCPU R08 | | | | | | Step No. | Line | Statement | Instruction | I/O (Device) | Blank | P/I Statement | Note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Module Type Information: | | RCPU R08 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Step No. | Line | Statement | Instruction | I/O (Device) | Blank | P/I Statement | Note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Instruction and argument (4 formats) | <p>❶ Describe an instruction and an argument in each column, and multiple arguments in the I/O (device) column in a different row.</p> <p>❷ Describe an instruction and an argument in the same instruction column.</p> <p>❸ Describe multiple arguments in the same I/O (device) column.</p> <p>❹ Describe arguments in the instruction column and the I/O (device) column separately.</p> | <table><tr><td rowspan="2">❶ {</td><td>0</td><td></td><td>MOV</td><td>D0</td><td></td><td></td><td></td></tr><tr><td>1</td><td></td><td></td><td>D1</td><td></td><td></td><td></td></tr><tr><td>❷ —</td><td>2</td><td></td><td>MOV D0 D1</td><td></td><td></td><td></td><td></td></tr><tr><td>❸ —</td><td>3</td><td></td><td>MOV</td><td>D0 D1</td><td></td><td></td><td></td></tr><tr><td>❹ —</td><td>4</td><td></td><td>MOV D0</td><td>D1</td><td></td><td></td><td></td></tr></table> | ❶ { | 0 | | MOV | D0 | | | | 1 | | | D1 | | | | ❷ — | 2 | | MOV D0 D1 | | | | | ❸ — | 3 | | MOV | D0 D1 | | | | ❹ — | 4 | | MOV D0 | D1 | | | | | | | | | | | | | | | | | | |
| ❶ { | 0 | | | MOV | D0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | | | D1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❷ — | 2 | | MOV D0 D1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❸ — | 3 | | MOV | D0 D1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❹ — | 4 | | MOV D0 | D1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Statement*1, *2 (2 formats) | <p>❶ Describe a statement in the line statement column.</p> <p>❷ Describe a statement with ";" in the instruction column.</p> | <table><tr><td>❶ —</td><td>5</td><td>*state</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>❷ —</td><td>6</td><td></td><td>;state</td><td></td><td></td><td></td><td></td></tr></table> | ❶ — | 5 | *state | | | | | | ❷ — | 6 | | ;state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❶ — | 5 | *state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❷ — | 6 | | ;state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PI statement*1 (4 formats) | <p>❶ Describe a pointer or interrupt pointer in the instruction column, and a PI statement in the PI statement column in the next row.</p> <p>❷ Describe a PI statement in the PI statement column in the same row as a described pointer or interrupt pointer.</p> <p>❸ Describe a PI statement with ";" following a described pointer or interrupt pointer.</p> <p>❹ Describe a pointer or interrupt pointer in the instruction column, and a PI statement with "[I" in the instruction column in the next row.*3</p> | <table><tr><td rowspan="2">❶ {</td><td>7</td><td></td><td>P0</td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td>P1state</td><td></td></tr><tr><td>❷ —</td><td>9</td><td></td><td>P0</td><td></td><td></td><td>P1state</td><td></td></tr><tr><td>❸ —</td><td>10</td><td></td><td>P0;P1state</td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">❹ {</td><td>11</td><td></td><td>P0</td><td></td><td></td><td></td><td></td></tr><tr><td>12</td><td></td><td>[P1state</td><td></td><td></td><td></td><td></td></tr></table> | ❶ { | 7 | | P0 | | | | | 8 | | | | | P1state | | ❷ — | 9 | | P0 | | | P1state | | ❸ — | 10 | | P0;P1state | | | | | ❹ { | 11 | | P0 | | | | | 12 | | [P1state | | | | | | | | | | | | |
| ❶ { | 7 | | | P0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8 | | | | | P1state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❷ — | 9 | | P0 | | | P1state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❸ — | 10 | | P0;P1state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❹ { | 11 | | P0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | | [P1state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Note*1 (5 formats) | <p>❶ Describe the last argument of an instruction in the I/O (device) column, and a note in the note column in the next row.</p> <p>❷ Describe the last argument of an instruction in the I/O (device) column, and a note in the note column in the same row.</p> <p>❸ Describe a note with ";" following a described instruction and argument in the instruction column.</p> <p>❹ Describe a note with ";" following a described argument in the I/O (device) column.</p> <p>❺ Describe an instruction in the instruction column, and a note with "<" in the instruction column in the next row.*4</p> | <table><tr><td rowspan="2">❶ {</td><td>13</td><td></td><td>OUT</td><td>Y0</td><td></td><td></td><td></td></tr><tr><td>14</td><td></td><td></td><td></td><td></td><td></td><td>note</td></tr><tr><td>❷ —</td><td>15</td><td></td><td>OUT</td><td>Y0</td><td></td><td></td><td>note</td></tr><tr><td>❸ —</td><td>16</td><td></td><td>OUT Y0;note</td><td></td><td></td><td></td><td></td></tr><tr><td>❹ —</td><td>17</td><td></td><td>MOV</td><td>D0 D1;note</td><td></td><td></td><td></td></tr><tr><td rowspan="2">❺ {</td><td>18</td><td></td><td>OUT Y0</td><td></td><td></td><td></td><td></td></tr><tr><td>19</td><td></td><td><note</td><td></td><td></td><td></td><td></td></tr></table> | ❶ { | 13 | | OUT | Y0 | | | | 14 | | | | | | note | ❷ — | 15 | | OUT | Y0 | | | note | ❸ — | 16 | | OUT Y0;note | | | | | ❹ — | 17 | | MOV | D0 D1;note | | | | ❺ { | 18 | | OUT Y0 | | | | | 19 | | <note | | | | |
| ❶ { | 13 | | | OUT | Y0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14 | | | | | | note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❷ — | 15 | | OUT | Y0 | | | note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❸ — | 16 | | OUT Y0;note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❹ — | 17 | | MOV | D0 D1;note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ❺ { | 18 | | OUT Y0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19 | | <note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inline structured text | Refer to the following:  Page 313 Format for inline structured text program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FB/FUN | Refer to the following:  Page 314 Format for function and function block For the format of a listed instruction for input circuits and output circuits, refer to the listed instruction in a CSV file exported from a program in which the same FB/FUN is used. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| END instruction | Make sure to describe the END instruction at the end of listed instructions. | <table><tr><td>20</td><td></td><td>END</td><td></td><td></td><td></td><td></td><td></td></tr></table> | 20 | | END | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | END | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

1 "" representing a peripheral statement or a peripheral note can be used.

*2 "[Title]" displayed in the navigation window can be used.

*3 "]" at the end is not imported.

*4 ">" at the end is not imported.

- '\t' (A tab) or ',' (a comma) can be used for delimiting items.
- Enclose an item including a delimiter or a line feed code with double quotes.
- When importing a program including a ladder block changed temporarily, the temporary change of the ladder block will be canceled.

- The range of a character string in a line statement to be imported differs depending on a line feed format in a CSV file.


| Line feed format | Import in GX Works2 | Import in GX Works3 |
|---|---|---|
| Line feed character "\r\n" is used | A character string in a single row including the line feed character "\r\n" is imported as a statement. | A character string in which a line feed is inserted is imported as a statement. |
| A CSV file is edited directly and a line feed is inserted in a character string | A character string up to the first line feed is imported as a statement. | |

- Constants are imported as they are; however, a single quote in a string constant is replaced with a double quote. (Example: 'ABC' → "ABC")

Exporting to a CSV file

A ladder program can be converted into a listed instruction format and exported to a CSV file.

Operating procedure

1. Open a ladder editor, and select [Edit] ⇒ [Export to File]().
2. Enter a file name to export in the "Export to File" screen.
3. Specify "CSV (tab delimited)(*.csv)" for the file type, and click the [Save] button.

Precautions

Programs including an unconverted ladder cannot be exported.


If more than 5000 inline structured text boxes exist in a program, an error will occur.

■File format

A saved CSV file opened in spreadsheet software is displayed as follows:

| | | | | | | |
|----------------------------------|------------------------|-------------|--------------|-------|---------------|------|
| Project1 | | | | | | |
| Module Type Information: RCPUR08 | | | | | | |
| Step No. | Line Statement | Instruction | I/O (Device) | Blank | P/I Statement | Note |
| 0 | [Title]Auto Operation | | | | | |
| 23 | | LD | X44 | | | |
| 24 | | CALL | P0 | | | |
| 27 | [Title]Operation Start | | | | | |
| 51 | | LD | X1 | | | |
| 52 | | AND | X2 | | | |
| 53 | | ANI | X3 | | | |
| 54 | | ANI | X4 | | | |
| 55 | | OUT | Y20 | | | |
| 56 | | END | | | | |

The following describes the detailed formats of a CSV file.

- The file format is Unicode (UTF-16 Little Endian with BOM).
- Items are delimited by '\t' (a tab).
- Each item is enclosed with '"' (double quotes).
- When '"' (a double quote) is included in an item, '"' (two double quotes) are displayed for each '"' (double quote) in the item.
- A line feed in a line statement is converted into '\r\n' (a line feed character).
- A line feed is inserted at the end of a row. The line feed code is CR+LF.
- The items for the module type information (1) and the header (2) are exported in a language set for the display language of GX Works3. ( Page 49 Display Language Switching)

■Format for inline structured text program

A saved CSV file which includes an inline structured text program is displayed in spreadsheet software as follows:

| | | | | | | |
|---|----------------|-------------|--------------|-------|---------------|------|
| PROJECT1_0901 | | | | | | |
| Module Type Information: | R08 | | | | | |
| Step No. | Line Statement | Instruction | I/O (Device) | Blank | P/I Statement | Note |
| 0 | | LD | X0 | | | |
| 1 | | AND | X1 | | | |
| 2 | | AND | X2 | | | |
| 3 | | AND | X3 | | | |
| 4 | | AND | X4 | | | |
| 5 | | STB1 | | | | |
| | | | | | Average | |
| 91 | | END | | | | |
| <STB1> AveData := (D1 + D2 + D3) / 3; </STB1> | | | | | | |

| No. | Item | Description | Format |
|-----|---|--|---|
| (1) | Instructions for inline structured text | The position of an inline structured text box and the inline structure text number*1 (1 to 5000) in the program are displayed. | STB (inline structured text number) |
| (2) | Title of an inline structured text | The title of an inline structured text box is displayed. | (Text of an inline structured text title) |
| (3) | Texts of an inline structured text | Inline structured text programs are displayed. | <STB (inline structured text number)> (Inline structured text program) </STB (inline structured text number)> |

*1 Indicates the number that is added to each inline structured text in order from the top in a program.

■Format for function and function block

The display example of CSV file in the format of function blocks is as follows.

When opening an exported CSV file that includes a function block in spreadsheet software, the data is displayed as follows:

| PROJECT1_0901 | | | | | | |
|-----------------------------------|------------------|---------------------------|-----------------|-------|---------------|------|
| Module Type Information: RCPU R08 | | | | | | |
| Step No. | Line Statement | Instruction | I/O (Device) | Blank | P/I Statement | Note |
| | 0 *;FB BLK START | | | | | (1) |
| | 1 | LD | input1 | | | (2) |
| | 2 | OUT | FB Counter.IN1 | | | (3) |
| | | FBCALL FbPou (FB Counter) | | | | (4) |
| | | IN1_IN BOOL | | | | (5) |
| | | OUT1_OUT BOOL | | | | (6) |
| | 12 | LD | FB Counter.OUT1 | | | (7) |
| | 13 | OUT | output1 | | | |
| | 14 *;FB BLK END | | | | | |
| | 14 | END | | | | |


| No. | Item | | Description | Format |
|-----|--------------------------|------------------------------|---|---|
| (1) | Starting position | | The starting position of a ladder block in which a function block is used is displayed. | *;FB BLK START |
| | | | The starting position of a ladder block in which a function is used is displayed. | *;FUN BLK START |
| (2) | Input circuit part | | An input circuit of an FB instance or a function is displayed. | Depends on an instruction (listed instruction format) ☞ Page 310 File format |
| (3) | FB instance/ function | Program starting position | The starting position of an FB program is displayed. | FBCALL (FB data name)(FB instance name) |
| | | | The starting position of the program of a function is displayed. | FUNCALL (FUN data name) |
| (4) | | Input label definition | A label name, IN, and data type of an input label is displayed. | (Label name) IN: (data type) |
| (5) | | Output label definition | A label name, OUT, and data type of an output label is displayed. | (Label name) OUT: (data type) |
| (6) | Output circuit part | | The output circuit of an FB instance or a function is displayed. | Depends on an instruction (listed instruction format) ☞ Page 310 File format |
| (7) | End position | | The end position of a ladder block in which a function block is used is displayed. | *;FB BLK END |
| | | | The end position of a ladder block in which a function is used is displayed. | *;FUN BLK END |

Exporting to an HTML file

A ladder diagram of a ladder program can be exported to an HTML file.

Data in an HTML file cannot be imported in a ladder program.

Operating procedure

1. Open a ladder editor, and select [Edit] ⇒ [Export to File] ().
2. Enter a file name to export in the "Export to File" screen.
3. Specify "HTML(*.html)" for the file type, and click the [Save] button.

Precautions

Programs including an unconverted ladder cannot be exported.

The number of displayed rows (height) of an inline structured text box is not applied in an HTML file.

The following items are not exported:

- Line number of an inline structured text program
- "*" added when entering a peripheral statement
- Data type of an argument of a function/function block

■Operating environment

The following table shows the operating environment.

| Item | Description | |
|------------------|--------------------|--|
| Operating system | Tablet, smartphone | Android® 4.0 or later iOS® 8 or later |
| | Personal computer | Microsoft® Windows 11 Microsoft Windows 10 |
| Browser | Tablet, smartphone | A browser supporting HTML5 and CSS3 The following browsers are recommended. • Google Chrome® (for Android) (version 4.3 or later) • Safari 8.0 or later |
| | Personal computer | A browser supporting HTML5 and CSS3 The following browsers are recommended. Microsoft Edge® Internet Explorer® 11 or later Safari 8.0 or later Google Chrome 4.3 or later |

An HTML file to which a ladder diagram is exported may not open properly in a web browser not supporting HTML5.

■File configuration

A ladder diagram is exported to an HTML file in the following file configuration.

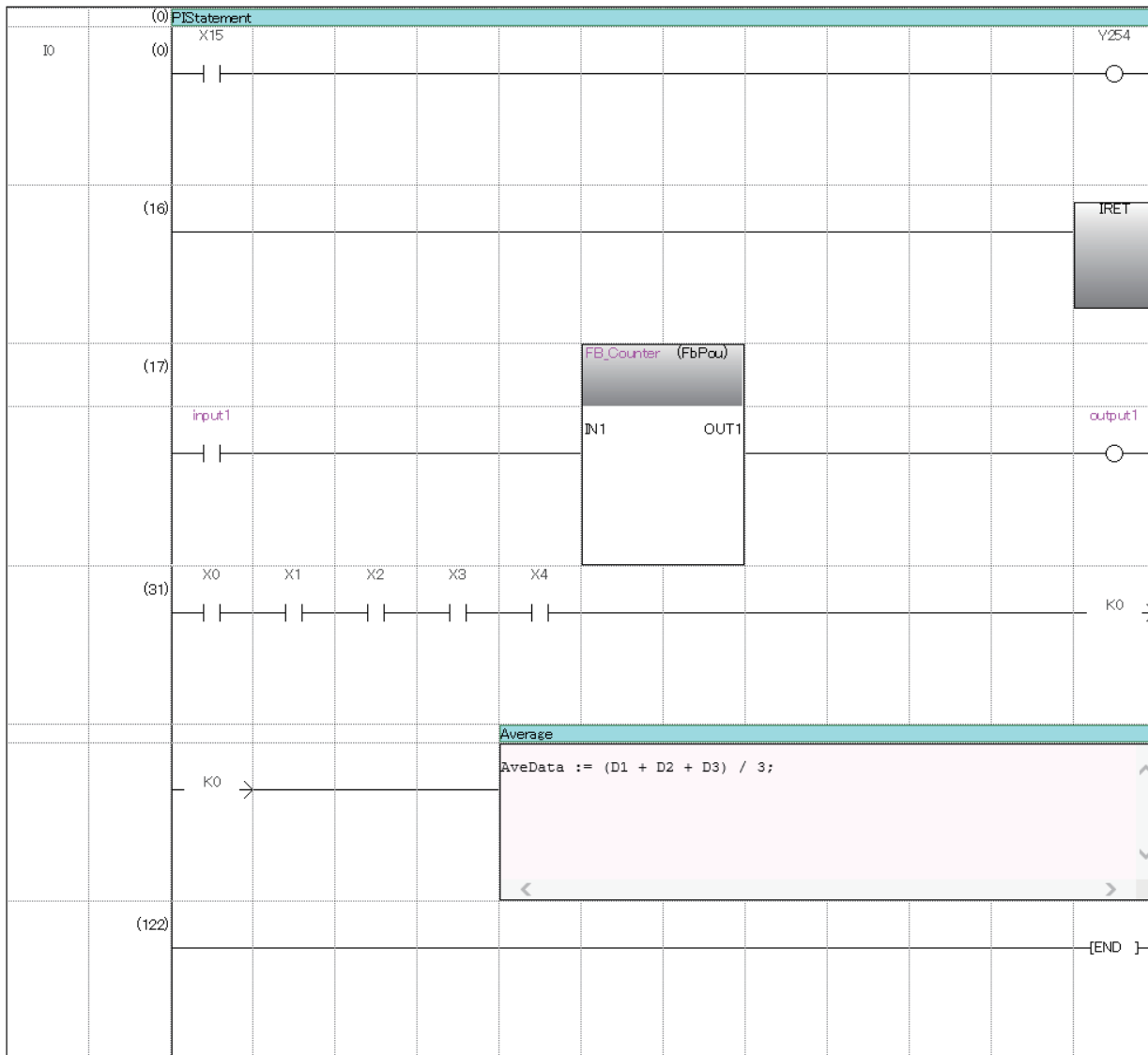
| Folder | Subfolder | File name | Description |
|---|-----------|---|--|
| Folder specified in the "Export to File" screen | — | (character strings specified in the "Export to File" screen).html | The following information on ladder elements of a ladder diagram is exported. • Picture name to be displayed • Label/device name • Character strings of comment/statement/note • Tag for assigning style information in a css file |
| | css | (character strings specified in the "Export to File" screen)BaseStyle.css | The following style information is exported. • Color and font settings configured when exporting • Layout information to display as a ladder diagram |
| | img | (ladder element name).png | A same picture as that of a ladder diagram displayed on a ladder editor is exported.*1 |

*1 The conditions for exporting are as follows:

- A ladder element in a ladder diagram displayed on the selected editor is exported as a picture.
- A cell width set individually on a ladder editor is not applied.
- A wrapped row of the first column and an icon row of the second column are not exported.

■File format

A saved HTML file opened in a web browser is displayed as follows:



- A line feed is not inserted for statements and comments.
- When closing ladder blocks in an outline display, they are exported in the closed state.
- Ladder blocks displayed in an editor can only be exported. (Example: When only a ladder block including a line statement is displayed)

Precautions

- When the magnification of a character in a web browser is not same, a file is not displayed properly.
- Some texts may get cut depending on the fonts used in a web browser.
- The number of characters and rows to display the character string data, such as a device name and a comment, may not match between a ladder editor and a web browser.
- When displaying a program with a large number of steps in an inline structured text box, the line of the left ladder may be cut off.
- The position of a command name may differ between a ladder editor and a web browser.
- When character strings are not displayed all, "... " is added to the end for a device, data name of a function/function block, FB instance name, statement, note, VAR_PUBLIC, and VAR_PUBLIC_RETAIN.
- The font color and background color of inline statements that are displayed in the navigation window are the same as the ones of other inline statements.


Exporting to a text file

A ladder diagram of a ladder program can be exported to a text file.

Data in a text file cannot be imported in a ladder program.

This function supports programs within 260 KB.

Operating procedure

1. Open a ladder editor, and select [Edit] ⇒ [Export to File]().
2. Enter a file name to export in the "Export to File" screen.
3. Specify "Text (*.txt)" for the file type, and click the [Save] button.

Precautions

Programs including an unconverted ladder cannot be exported.

The number of displayed rows (height) of an inline structured text box is not applied in a text file.

The following item is not exported:

- Line number of an inline structured text program

■Operating environment

When characters are not displayed on the text editor or the display width of ladder diagrams is not uniform, check the operating environment.

It is considered to occur in the following cases.

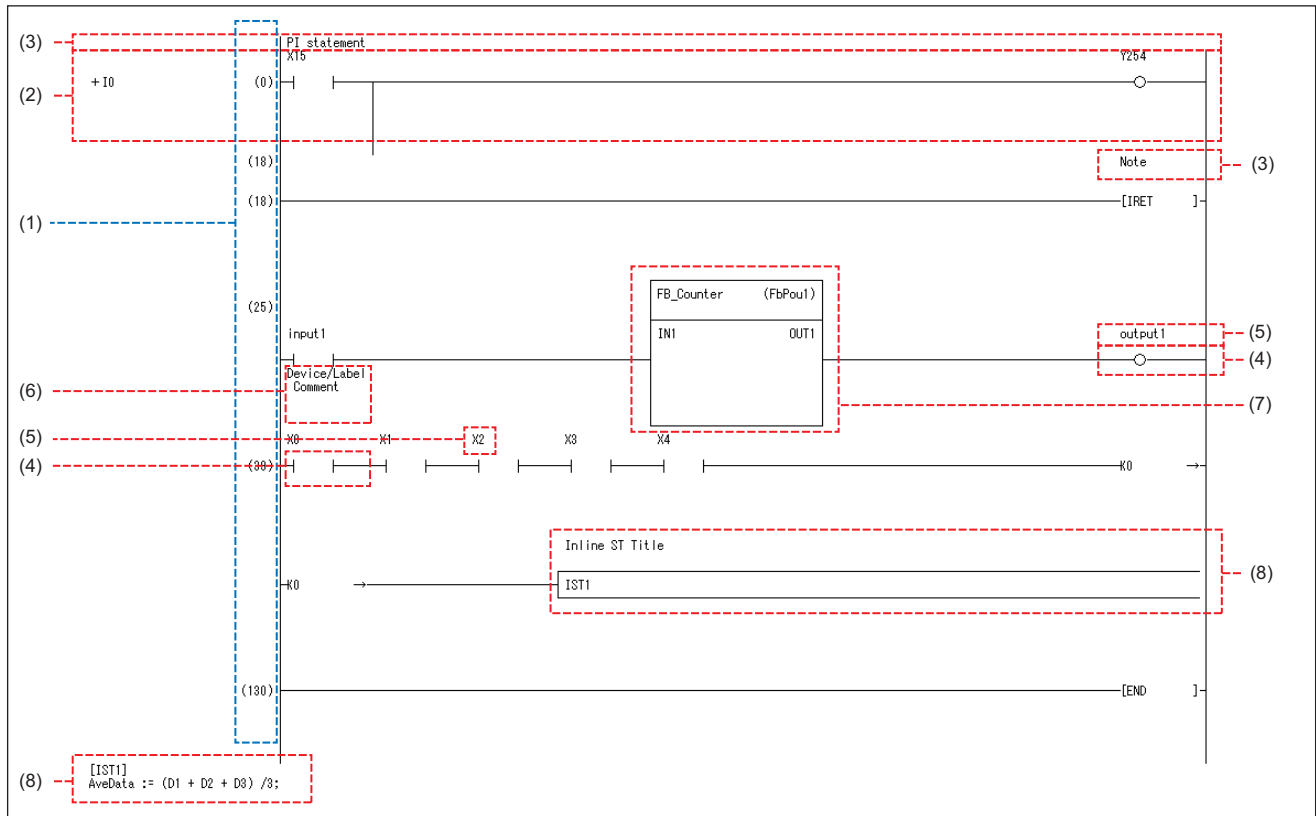
- A non-Japanese version of operating system is used.
- Japanese fonts are not installed.
- Fonts that are not supported by Shift JIS are used.

To display an exported text file normally, set the following settings.

- Install Japanese fonts and set the system locale as Japanese.
- Set the used fonts to monospaced fonts on the text editor.

■File format

A saved text file opened on the text editor is displayed as follows:



| No. | Item | Description |
|-----|--------------------------------|--|
| (1) | Step No. | Step numbers are displayed. When do not output step No. select "No" in the following option. • [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Export to File" ⇒ "Text Format" ⇒ "Output Step No." |
| (2) | Outline display | When closing a ladder block in an outline display, "+" is displayed in the beginning of the row. Functions/function blocks closed in an outline display, only the function names or the label names of function blocks are displayed. |
| (3) | Statement ^{*1} | No line feed: It is displayed in one line. |
| | PI statement ^{*1} | Line feed used: The line feed is applied. |
| | Note ^{*1} | The following option is not applied. • [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Contact Display Width" |
| (4) | Contact/coil | Contacts/coils in a ladder program are displayed. |
| (5) | Device/label ^{*2,*3} | It is displayed in six lines for one cell. The number of rows to display differs depending on the following option. • [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Numbers of Wrapping Rows for Device/Label Name" |
| (6) | Device comment ^{*2} | It is displayed in four lines under the ladder diagram. The following option is not applied. • [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Display Format" ⇒ "Number of Characters" |
| (7) | Function | The names and the titles of functions are displayed. |
| | Function block | The label names of function blocks and the function block names are displayed. |
| (8) | Inline structured text box | Inline structured text boxes in a ladder program are displayed as the character string 'ISTn' ^{*4} . The titles of inline structured text boxes are displayed one line upper than the ones for the character string 'ISTn.' |
| | Inline structured text program | Inline structured text programs are displayed under the row for the END instruction. |

- *1 For peripheral statements or peripheral notes, '*' is added in the beginning of the character strings.
- *2 Up to 12 characters are displayed per row.
- *3 Characters exceeding the display range are displayed as '...'.
- *4 'n' indicates an integer that is added in the output order of inline structured text boxes.

Precautions

- Up to 12 characters for one cell, and up to 14 characters for one line
- The file format is Unicode (UTF-16 Little Endian with BOM).
- Grids are not displayed.
- Ladder blocks displayed in an editor can only be exported. (Example: When only a ladder block including a line statement is displayed)

Exporting to all files


The following explains the procedure to export ladder programs to a CSV file, HTML file, and text file simultaneously. For the format of each file and a method to export ladder programs to each format file, refer to the following:

 Page 312 Exporting to a CSV file

 Page 315 Exporting to an HTML file

 Page 317 Exporting to a text file

Operating procedure

1. Open a ladder editor, and select [Edit] ⇒ [Export to File]().
2. Enter a file name to export in the "Export to File" screen.
3. Specify "All File Formats(*.csv;*.html;*.txt)" for the file type, and click the [Save] button.

6.4 Creating an ST Program

This section explains the creation method of an ST program.

The details on the specification of ST program are described in the following manual. Please read it in advance.

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Point

The display format and detailed operation settings for each function can be set by setting the following option.
[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "ST Editor"

Configuration of an ST editor

ST editor is a language editor in text format for creating programs in Structured Text.

Spaces, tabs, and line feeds can be entered between keywords and variable names of a control syntax.

Terms and symbols that configure the program is referred to as a token.

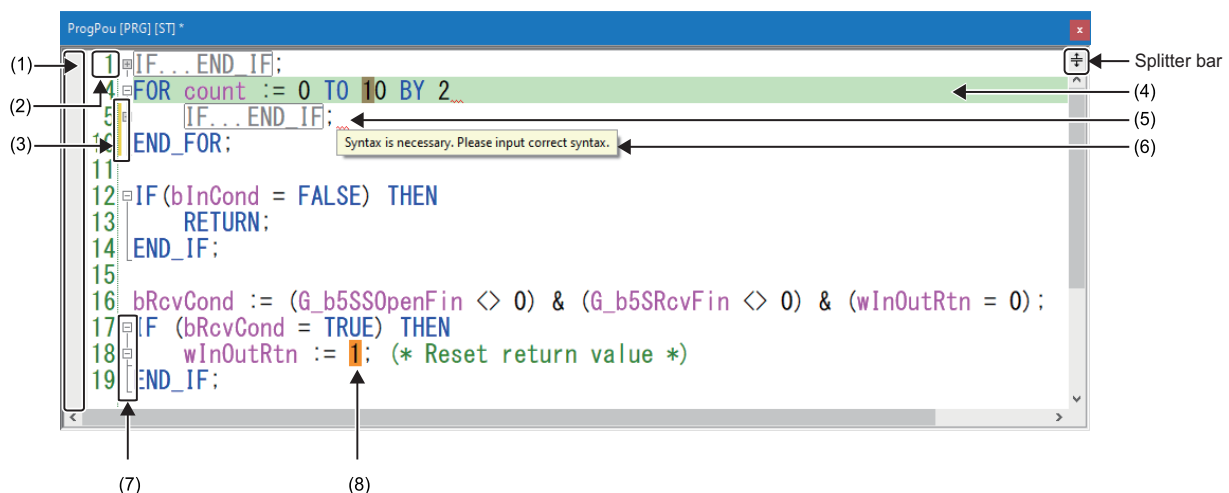
Window

Select "Program" ⇒ "(execution type)" ⇒ "(program file)" ⇒ "(program block)" ⇒ "ProgramBody" in the navigation window.

■ Toolbar



■ ST editor



Displayed items

| Item | Description | Related operation |
|-------------------------|---|---|
| (1) Icon display area | The area to display icons | ■ Icon type 📖 Page 321 Icon type |
| (2) Line number | The line numbers of a program | ■ Changing display contents [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "ST Editor" ⇒ "Editor Display Items" |
| (3) Change tracking | The head of a line where the program has been changed is highlighted. | |
| (4) Highlighted display | The line on which the cursor is placed is highlighted. | |
| (5) Error display | A syntax error of the program is displayed. | |

| Item | Description | Related operation |
|------------------------|---|---|
| (6) Tool hint | Information where the mouse cursor is placed over is displayed. | ■ Changing display contents [Tool] ⇒ [Options] ⇒ [Program Editor] ⇒ "ST Editor" ⇒ "Tool Hint" ■ Hierarchy display setting for structure comments [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Hierarchy Display Setting for Structures Comment" By setting this option to "In Order of Instance -> Member" or "In Order of Member -> Instance," label comments for a structure and structure member can be displayed together when selecting a range of the structure member. |
| (7) Outline display | Symbols to display/hide the text blocks are displayed. (Outlines can be nested up to 130 levels.) | ■ Show/Hide • [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "ST Editor" ⇒ "Editor Display Items" • [View] ⇒ [Outline] ⇒ [Show/Hide of Outlines] |
| (8) Incremental search | A searched keyword is highlighted. | ■ Find Page 328 Incremental search |

Point

- An ST editor can horizontally be split into two screens by either of the following operations:
 - Select [Window] ⇒ [Split].
 - Drag the splitter bar downward or double-click it.
 To restore the split, drag the splitter bar to the top/bottom of the ST editor.
- A screen can be scrolled horizontally by scrolling the mouse wheel while pressing the key.
- The insert mode and overwrite mode can be switched by selecting the following menu:
 - [Edit] ⇒ [Switch Insert/Overwrite mode]

■ Colors of programs (default)

| Figure | Description | Default color |
|--------|----------------------------------|---------------|
| | (1) Control syntax | Blue |
| | (2) Device | Black |
| | (3) Operator | Black |
| | (4) Global label | Magenta |
| | (5) Error | Red |
| | (6) Local label | Magenta |
| | (7) Constant | Black |
| | (8) String constant | Black |
| | (9) Incremental search highlight | Light orange |
| | (10) Comment | Green |
| | (11) Change tracking | Yellow |

Point


- Font color, background color, and font can be changed.
- Page 82 Checking and Changing Colors and Fonts

■ Icon type

| Icon | Description |
|------|--|
| | This icon is displayed on the line jumped from the cross reference window. |
| | This icon is displayed on the error line jumped from the "Output" window. |

■Keywords for collapse and automatic indent

A line can be outlined and displayed collapsed by using the keywords shown below.

Additionally, pressing the  key in a control syntax inserts an indent automatically.

| Category | Start | End | Automatic indent |
|---------------------|--------|------------|------------------|
| Comment texts | (* | *) | × |
| | /* | */ | × |
| Selection statement | IF | END_IF | ○ |
| | CASE | END_CASE | ○ |
| While loop | FOR | END_FOR | ○ |
| | WHILE | END_WHILE | ○ |
| | REPEAT | END_REPEAT | ○ |

Entering programs

This section explains the entering method of an ST program.

For the functions/instructions used in ST programs, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Point

- By pressing **Ctrl** + **Shift** + **=** keys, an assignment operator (:=) can be entered.
- By selecting a row, then pressing the **Shift** + **Alt** + **↑**/**↓** keys or dragging the mouse while pressing the **Alt** key, multiple rows can rectangularly be selected.
They also can be edited simultaneously. (📖 Page 327 Editing multiple rows simultaneously)
- By pressing the **Ctrl** + **Shift** + **↑**/**↓** keys, a row of the cursor position can be moved upward or downward.

Precautions

When an ST editor is set to read-only or monitoring, the program cannot be edited.

Inserting instructions, functions, and control syntax

There are two methods for entering instructions, functions, and control syntax: entering texts using keyboard^{*1} and dragging and dropping them in the element selection window.

The input control syntax, operators, devices, and TRUE/FALSE are changed to the upper-case characters automatically, and a program will be in the unconverted state.

However, when multiple rows are rectangularly selected and edited, they are not changed to the upper-case characters.

Labels can be entered with aliases.

- *1 Options of instructions/labels are displayed by pressing the **Ctrl** + **Space** keys.
In addition, by selecting "Yes" for the following option, when entering the description of a device comment, label comment, or instruction, ones for which the data has been set can be displayed as options.
[Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

■ Specification method for data type of device

The data type of a word device is normally handled as INT (Word [Signed]) on an ST editor.

By adding a device type specifier, which indicates a device type, to a device name, a device storing 32-bit integer or real number can be described directly in an operation formula.

For details, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Inserting a function block

The following shows the procedure for inserting a function block to an ST program.

For the creation method of a program in a function block, refer to the following:

📖 Page 505 Creating a Function Block

Operating procedure

1. Drag and drop a function block from the navigation window or element selection window onto any position in an ST editor.
2. Enter the information of a label (FB instance)^{*1} in the "Undefined Label Registration" screen.
3. Enter the values for the input variables and output variables.

^{*1} If the definition name of the function block includes any of the following symbols, the symbol is replaced with an underscore (_) in the "Label Name" column: plus sign (+), minus sign (-), exclamation mark (!), left round bracket ((), right round bracket()), or backquote (`).

Ex.

When the defined function block is "MYTIMER"

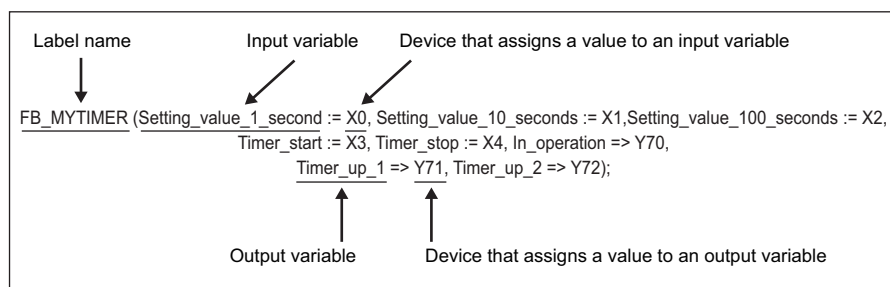
[Details of defined function block]

Label name: FB_MYTIMER

Input variable: Setting_value_1_second, Setting_value_10_seconds, Setting_value_100_seconds, Timer_Start, Timer_Stop

Output variable: In_operation, Timer_up_1, Timer_up_2

The example of entering ST program are shown below.



The output of the function block can be obtained by specifying the output variable name with a period (.) suffixed to the function block name.

Enter an instruction to obtain the output after performing the function block call.

```
Y70 := FB_MYTIMER.In operation;
```

■Displaying/setting FB properties

FB properties can be displayed and set in the "FB Property" window.

For details, refer to the following:

📖 Page 387 Display/setting an FB property


■FB property management (offline)

Initial values of FB properties saved in a project can be exported to a CSV file in the "FB Property Management (Offline)" screen. In addition, the initial values of FB properties can be imported from the CSV file, and the values can be applied to the initial values of FB properties in the project.

For details, refer to the following:

📖 Page 408 FB property management (offline)

Registering an undefined label


When entering an undefined label, the "Undefined Label Registration" screen appears and the label can be registered in a label editor. ( Page 257 Registering an undefined label)

Displaying syntax templates

'Syntax template' is the format of control syntax and data types of arguments which are defined in each instruction, function, and operator.







In an ST editor, the syntax template of inserted instructions and others can be displayed.

Operating procedure

1. Select the token of which syntax template is to be displayed.
2. Select [Edit] ⇒ [Display Template] ().
3. Enter the arguments in accordance with the displayed template.

Delete the data type name enclosed with '?,' and enter a label name or device corresponding to its data type.

Point

- Select [Edit] ⇒ [Mark Template (Left)] ()/[Mark Template (Right)] (), or press the  +  +  /  keys to select an argument of the template one by one.
- By selecting "Yes" for the following option, a syntax template is displayed with the arguments aligned vertically.
 - "Program Editor" ⇒ "ST Editor" ⇒ "Edit Operation" ⇒ "Vertically Align Arguments for Displaying Template"

Editing multiple rows simultaneously

By selecting multiple rows rectangularly, they can be edited simultaneously.

The following uses a procedure to change a value, to be substituted to a device, as an example.

Ex.

Changing a value to be substituted from 100 to 500.

Operating procedure

1. Select multiple rows rectangularly by either of the following operations:
 - Press the **Shift** + **Alt** + **↑**/**↓** keys, then press the **Shift** + **←**/**→** keys.
 - Drag the mouse while pressing the **Alt** key.

```
1 IF wLabel1 = 20 THEN
2   D1:=100;
3   D0:=100;
4   D2:=100;
5   D3:=100;
6 END_IF;
```

2. Enter '5.'

```
1 IF wLabel1 = 20 THEN
2   D1:=500;
3   D0:=500;
4   D2:=500;
5   D3:=500;
6 END_IF;
```

6

Point

When selecting multiple rows rectangularly without including a character string, the operation differs depending on the edit mode.

Example: When placing the cursor between operators and '100' and selecting rectangularly, then entering '5'

- Insert mode

The diagram shows two side-by-side code editors. The left editor shows the initial state with 'D1:=100;' on line 2, 'D0:=100;' on line 3, 'D2:=100;' on line 4, and 'D3:=100;' on line 5. A green highlight covers lines 4 and 5. A cursor is positioned between the colon and '100' on line 4. An arrow points from this editor to the right editor. The right editor shows the result after entering '5' in Insert mode: 'D1:=5100;' on line 2, 'D0:=5100;' on line 3, 'D2:=5100;' on line 4, and 'D3:=5100;' on line 5. The green highlight still covers lines 4 and 5, and the cursor is now at the end of the line.

- Overwrite mode

The diagram shows two side-by-side code editors. The left editor is identical to the one in the Insert mode example. An arrow points from this editor to the right editor. The right editor shows the result after entering '5' in Overwrite mode: 'D1:=500;' on line 2, 'D0:=500;' on line 3, 'D2:=500;' on line 4, and 'D3:=500;' on line 5. The green highlight covers lines 4 and 5, and the cursor is positioned between the colon and '500' on line 4.

Searching for/replacing data in a program

The search functions that can be used in ST editor are as follows.

| Function name | Description | Reference |
|--------------------|--|-----------------------------|
| Jump | To specify a line number on an ST editor, and move to the corresponding line. | Page 328 Jump |
| Incremental search | To highlight a searched keyword. | Page 328 Incremental search |
| Cross reference | To check a declaration location and a reference location of a device* ¹ and a label in a list. | Page 460 SEARCHING FOR DATA |
| Device list | To check the usage of devices being used* ¹ . | |
| Find and replace | <ul style="list-style-type: none">To search for and replace a device name*¹, label name, instruction name, and character string.To change contacts between open contact and close contactTo replace devices in a batch. | |

*¹ It is searched with a device name excluding a device type specifier.

Jump

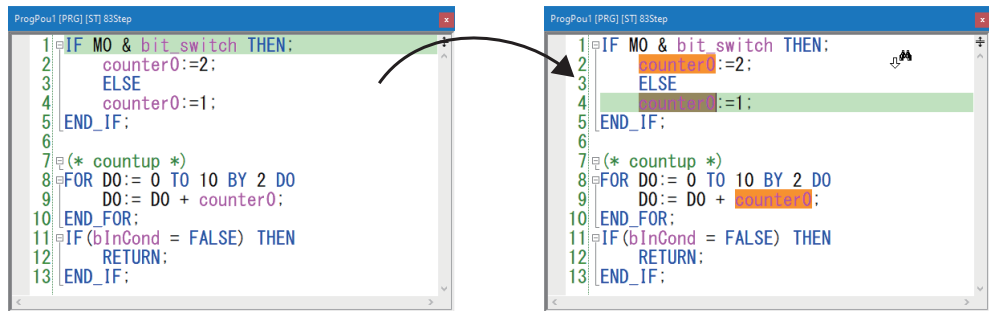
Specify a line number and move the cursor on an ST editor.

Operating procedure


1. Select [Find/Replace] ⇒ [Jump].
2. Enter a line number of the program in the "Jump" screen, and click the [OK] button.

Incremental search

Specify a keyword to highlight it.



Operating procedure

1. Press the **Ctrl** + **I** keys.
The icon of the mouse cursor changes to , and an ST editor is switched to the incremental search mode.
2. Enter a keyword to be highlighted directly.
The corresponding location to the entered keyword is highlighted. (Up to 3000 keywords)
3. Press the **Ctrl** + **I** keys to jump to a lower keyword.
Press the **Shift** + **Ctrl** + **I** keys to jump to an upper keyword.
4. Press the **Esc** key to end the incremental search mode.

Point

Searching and jumping can also be performed by using the following menus:

- ST editor: [Find/Replace] ⇒ [Incremental Search] ⇒ [Search Down]/[Search Up]
- Inline structured text in a ladder editor: [Find/Replace] ⇒ [Inline Structured Text] ⇒ [Incremental Search] ⇒ [Search Down]/[Search Up]


Displaying instruction help

The instructions used in an ST program can be checked in e-Manual Viewer.
To check the instructions, the file of the corresponding manual must be registered in e-Manual Viewer.
The applicability of help display is shown below.


○: Applicable, ×: Not applicable

| Token type | Applicability |
|-----------------------------|---------------|
| Operator | × |
| Control syntax | × |
| Function | ○ |
| Function block | ○ |
| Constant, variable, comment | × |

Operating procedure

1. Place the cursor on the token of the target instruction.
2. Press the  key.

Point

If a help file is associated with a function or function block, the help file opens. ( Page 141 Associating data with a help file)

6.5 Creating an FBD/LD Program

This section explains the creation method of an FBD/LD program.

The details on the specification of FBD/LD program are described in the following manual. Please read it in advance.

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

In the FBD/LD program with the process control extension enabled, the process control function blocks can be used.

For details, refer to the following:

📖 Page 24 Settings for using process control functions

Point

The display format and detailed operation settings for each function can be set by setting the following option.
[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor"

Configuration of an FBD/LD editor

FBD/LD editor is a graphical language editor to create programs by combining Function Block Diagram language with Ladder Diagram language.

Programs can be created only by placing the prepared elements vertically and horizontally, and connecting them.

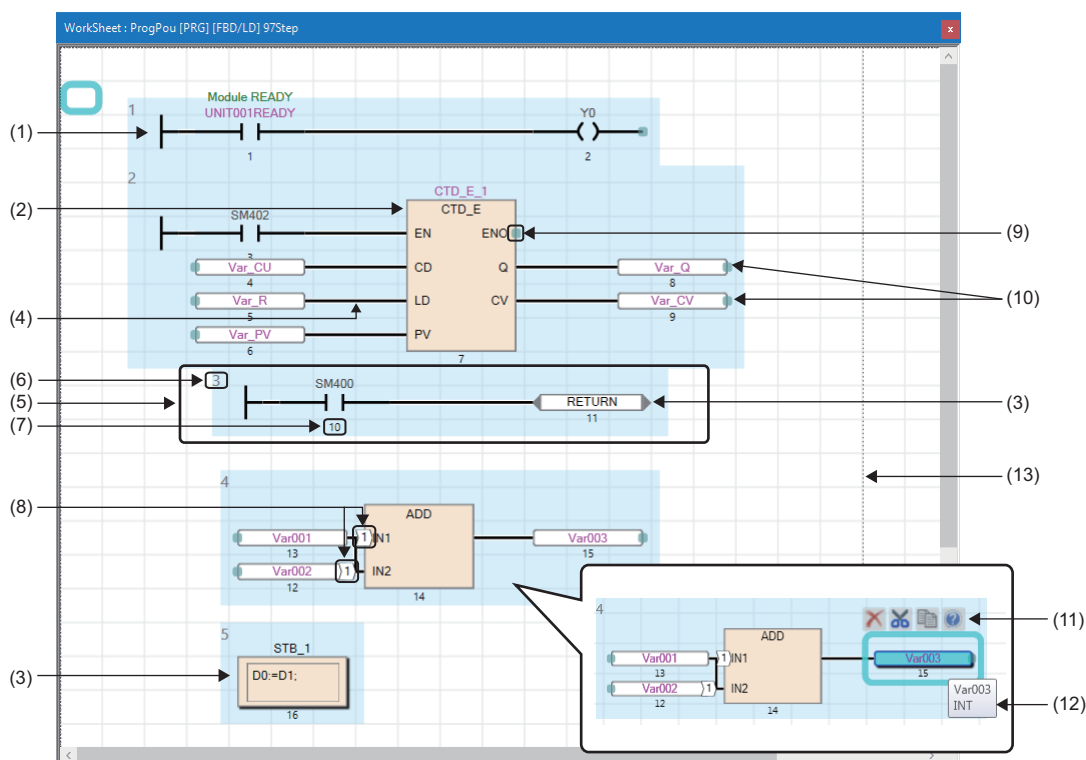
Window

Select "Program" ⇒ "(execution type)" ⇒ "(program file)" ⇒ "(program block)" ⇒ "(worksheet)" in the navigation window.






■ Toolbar



■ FBD/LD editor



Displayed items

| Item | Description | Editing operation |
|--------------------------------|---|---|
| (1) LD element | An element that constitutes a ladder program  Page 332 LD element | ■Editing method: Page 336 Entering programs |
| (2) FBD element | An element that constitutes an FBD program  Page 333 FBD element | |
| (3) Common element | A common element that helps creating an FBD/LD program  Page 334 Common element | |
| (4) Connection line | A line that connects the connection points between elements. It is displayed by placing an element to be connected closer to the connection point on the connection target. | ■Editing method: Page 339 Common operations of elements |
| (5) FBD network block | A single FBD network block composed of all elements connected each other or elements that perform any processing independently (such as a function block and a jump label). Maximum 4096 FBD network blocks can be created in a program. | ■Release from an FBD network block: Select an element to be released, and move it with the  key held down. ■Layout adjustment: Page 346 Layout correction |
| (6) FBD network block No.*1,*2 | A number assigned for each FBD network block in order from upper left to lower right on the editor is displayed. | — |
| (7) Execution order*1,*2 | The program execution order is displayed. | |
| (8) Automatic connector | It is automatically displayed when a connection line cannot be displayed due to the positions of elements. Elements with same number indicates that they are connected. | |
| (9) Connection point | A terminal point of when connecting elements with a connection line. By adding an element while a connection point is being selected, the element can be added with it connected already. | |
| (10) Grid*1,*2 | A grid line that serves as makers to place the elements | — |
| (11) Smart tag*2 | An operation button displayed around the selected element. Relevant functions can be performed by clicking the button. | |
| (12) Tool hint*2 | The information on device/label and FB/FUN where the mouse cursor is placed over is displayed. | |
| (13) Page break*1 | A line that indicates a page break for printing ( Page 96 Printing FBD/LD programs) | |

*1 Shown or hidden by selecting in the [View] menu.






*2 Shown or hidden according to the setting in [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor."

Point

Font color, background color, and font can be changed.

However, for a comment element, only font color and background color can be changed.

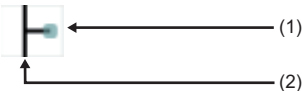
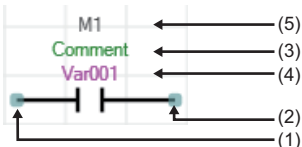
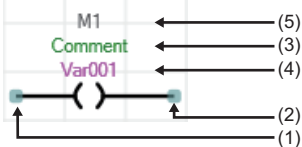
 Page 82 Checking and Changing Colors and Fonts

By pressing the  +  /  /  /  keys, the cursor can be moved on the editor without selecting elements.

Elements

The following tables show the usable elements in an FBD/LD program.

■LD element

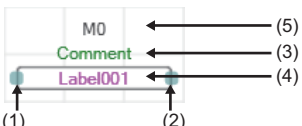

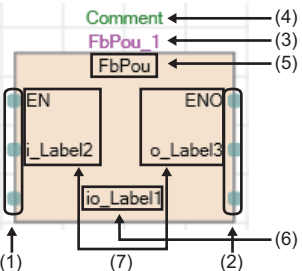
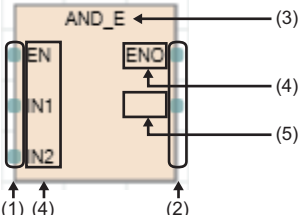
| Element | Name of each part | Description |
|--|--|---|
| Left power rail element  | (1) Output connection point (2) Left power rail | The position of a left power rail can be placed at will, and it will be the starting point for creating a ladder program. |
| Contact element  | (1) Input connection point (2) Output connection point (3) Label comment/device comment ^{*1,*2,*3} (4) Device/label ^{*3} (5) Assigned device ^{*1,*2} (Only for global labels to which devices are assigned) | Specify the device/label. It transmits the ON/OFF signal according to the specified information. For details on the element, refer to the following: ■MELSEC iQ-R Programming Manual (Program Design) ■MELSEC iQ-F FX5 Programming Manual (Program Design) |
| Coil element  | | Specify the device/label. It outputs the signal to the specified device/label according to the transmitted ON/OFF signal. For details on the element, refer to the following: ■MELSEC iQ-R Programming Manual (Program Design) ■MELSEC iQ-F FX5 Programming Manual (Program Design) |

*1 Shown or hidden by selecting in the [View] menu.

*2 Shown or hidden according to the setting in [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor."

*3 A comment or others can be wrapped according to the setting in [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor."

■FBD element

| Element | Name of each part | Description |
|---|---|---|
| Variable element  | (1) Input connection point (2) Output connection point (3) Label comment/device comment ^{*1,*2,*3} (4) Device/label (5) Assigned device ^{*1} (Only for global labels to which devices are assigned) | Specify the device/label. Information can be obtained/stored in the specified device/label. It is switched to a constant element by entering a constant. |
| Constant element  | (1) Output connection point (2) Constant value | Specify a constant. The specified constant can be output. It is switched to a variable element by entering a device/label. |
| Function block element  | (1) Input connection point (2) Output connection point (3) FB instance name (label) ^{*5} (4) Label comment ^{*1,*2} (5) Data type (6) Input/output label (VAR_IN_OUT) ^{*4} (7) Input/output label (other than VAR_IN_OUT) ^{*4} | Indicates a block for function corresponding to the data type. It is used with an FB instance name assigned to each element. For details on the element, refer to the following: ☞ Page 503 SEGMENTING PROGRAMS The width of an element can be changed. (☞ Page 343 Changing the element size) The height of an element can be changed. (☞ Page 345 Changing the height of an element) |
| Function element  | (1) Input connection point (2) Output connection point (3) Data type (4) Input/output label (argument) ^{*4} (5) Return value | Indicates a block for function corresponding to the data type. The name is not displayed in the return value. For details on the element, refer to the following: ☞ Page 503 SEGMENTING PROGRAMS The width of an element can be changed. (☞ Page 343 Changing the element size) The height of an element can be changed. (☞ Page 345 Changing the height of an element) |

*1 Label comments of FB instances can be displayed by selecting the following menu:

[View] ⇒ [Comment Display] ⇒ [Device/Label Comment]

They can also be displayed by setting "Yes" for the following option:

[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Comment" ⇒ "Display Item" ⇒ "Display Label/Device Comment"

*2 A comment or others can be wrapped according to the setting in [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor."

*3 Label comments for a structure and its member can be displayed together by setting this option to "In Order of Instance -> Member" or "In Order of Member -> Instance":

[Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Hierarchy Display Setting for Structures Comment"

*4 The display format for Input/output labels can be changed to their label comments by selecting the following menu:

[View] ⇒ [Comment Display] ⇒ [Switch FB/FUN Argument]





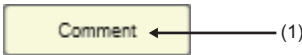

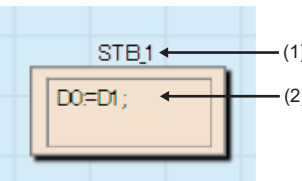


They can also be changed by setting "Yes" for the following option:

[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Comment" ⇒ "Display Item" ⇒ "Switch FB/FUN Argument to Comment"

*5 An FB instance name can be changed by double-clicking the name.

Common element

For a jump element and a return element, inverting contact on its connection point is not available.

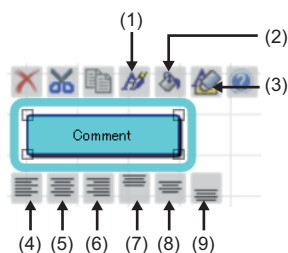
| Element | Name of each part | Description |
|--|--|--|
| Jump element  | (1) Input connection point (2) Label* ¹ | It is used to jump the execution processing from a jump element to a jump label element. |
| Jump label element  | (1) Label* ¹ | Enter a label to be specified as the jump destination. |
| Connector element  | (1) Input connection point (2) Output connection point (3) Connector label | It is used instead of a connection line when placing an FBD network block in the display range or print range on an editor. The same connector label indicates that they are connected. |
| Return element  | (1) Input connection point (2) Character string, "RETURN" (Not editable) (1) Label | It is used to suspend the processing in the middle of processing. |
| Comment element  | (1) Comment display area | It is used to enter a comment. Up to 2000 characters can be entered in a comment element. The frame size of a comment can be adjusted automatically according to the comment length by double-clicking the frame. It can be changed manually as well. ( Page 343 Changing the element size) |
| Inline structured text element  | (1) Data name (2) Preview display area | It is used to create an inline structured text program. For details on the element, refer to the following:  Page 340 Inserting an inline structured text element The size of an element can be changed. ( Page 343 Changing the element size) |

*1 Only local label that "Pointer" is selected for "Data Type" can be used. In addition, the members of a structure cannot be used.

Point

The settings of the comment element color and text layout can individually be changed by using smart tags.

- To set the font color, click the smart tag (1).
- To set the background color, click the smart tag (2).
- To set the text layout, click a smart tag (4) to (9).
- To return the settings of colors and text layout which were individually changed to the default, click the smart tag (3).



- (1): Font Color
- (2): Background Color
- (3): Clear Format
- (4): Align Left
- (5): Align Center
- (6): Align Right
- (7): Align Top
- (8): Align Middle
- (9): Align Bottom

Precautions

When the following contents are changed by using a menu or setting an option, the display of a label name, device, comment, or assigned device of an element may overlap with those of another element. In that case, arrange the position of those elements.

- Whether or not to display an assigned device
- Whether or not to display a device/label comment
- Number of rows to display a device/label comment
- Number of wrapping rows for device/label name
- Number of cells for device/label name
- Number of wrapping rows for instance name
- Number of cells for instance name

Entering programs


This section explains the entering method of an FBD/LD program.

Adding elements


Operating procedure

■Using the edit box

Select^{*1} a cell that the element is to be added, then enter a label name or data type of FB/FUN directly.

An element name and label name can be edited directly by selecting a placed element and pressing the  key.

The following items can be entered:

- Device
- Label/assigned device ( Page 338 Displaying a global label entered by using an assigned device)
- Constant
- FB/FUN
- Instruction
- Data name of an inline structured text element

^{*1} Options of instructions/labels are displayed by pressing the  +  keys.

In addition, by selecting "Yes" for the following option, when entering the description of a device comment, label comment, or instruction, ones for which the data has been set can be displayed as options.

[Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

■Inserting from the menu or on the toolbar

Select a cell to which an element is to be added on an FBD/LD editor, then select [Edit] ⇒ [Add Element (Ladder Symbol)] ⇒ [(element)]. It can also be added by selecting from the toolbar.


■Inserting from the element selection window

Select an element in the element selection window, and drag and drop it onto an FBD/LD editor.

■Inserting a function block

1. Drag and drop a function block from the navigation window or element selection window onto any position in an FBD/LD editor.
2. Enter the information of a label (FB instance)^{*1} in the "Undefined Label Registration" screen.
3. Connect variable elements to input/output arguments.

For the creation method of a program in a function block, refer to the following:

 Page 505 Creating a Function Block

^{*1} If the definition name of the function block includes any of the following symbols, the symbol is replaced with an underscore (_): plus sign (+), minus sign (-), exclamation mark (!), left round bracket ((), right round bracket()), or backquote (`).

Switching methods for contacts/instructions

Select a contact/instruction to be switched, and select [Edit] ⇒ [Easy Edit] ⇒ [Invert Contact (Open/Close)](🔍)/[Switch Pulse](🔍)/[Switch SET and RST](🔍) or follow the methods shown below.


| Switching contacts and instructions | Shortcut key | Remarks |
|---|--------------|---|
| Switching open/close contact, raising/falling pulse | | — |
| Inverting contact, switching SET/RST instructions | | — |
| Inverting contact on connection point of FB/FUN | | <p>Only when the data type of the connection point is one of the following:</p> <ul style="list-style-type: none"> • Bit • Word [Unsigned]/Bit String [16-bit] • Double Word [Unsigned]/Bit String [32-bit] • ANY_BIT • ANY_BOOL |

■Displaying a global label entered by using an assigned device

By entering a device which was assigned as a global label to a program, the global label of the device can be displayed in the program.

Note that, only global labels whose data type is the simple type with no array can be displayed.


Enter an assigned device after changing the entering method by one of the following option, then the global label is displayed.


- [Edit] ⇒ [Edit Mode] ⇒ [Use Assigned Device for Label Input]
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Use assigned device for label input"

■Specification method for data type of device

In an FBD/LD editor, data type can be specified for a word device by adding a device type specifier, which indicates a data type, to a device name.

For details, refer to the following:

 MELSEC iQ-R Programming Manual (Program Design)


 MELSEC iQ-F FX5 Programming Manual (Program Design)

Common operations of elements

| Operation | | Operating procedure | |
|-----------------|--|---|--|
| | | Mouse | Keyboard |
| Select | To select a single element | Click an element to be selected. | Move the cursor on an element to be selected. |
| | To select multiple elements | <ul style="list-style-type: none"> Click multiple elements with the Ctrl / Shift key held down. Click the background of an FBD/LD editor, and drag the mouse diagonally around all elements to be selected. | Select multiple elements by moving the cursor with the Shift key held down. |
| | To select an FBD network block ^{*1} | Click an element, and select [Edit] ⇒ [Select FBD Network Block]. | Select an element and press the Ctrl + Shift + A keys. |
| | To select all elements | The operation is the same as that for selecting multiple elements. | Press the Ctrl + A keys. |
| Change a name | | Double-click an element of which the name is to be changed, and enter a new name. | Select an element of which the name is to be changed, and press the Enter ^{*2} or F2 key, then enter a new name. |
| Move | | Drag and drop an element. (By moving an element with the Shift key held down, it can be separated moved from the FBD network block. The elements that were connected to the moved element are automatically connected. ^{*3}) | Select the element to be moved, and press the Ctrl + Shift + ← / → / ↑ / ↓ keys. |
| Copy | | Drag and drop an element to be copied with Ctrl held down. | Press the Ctrl + C keys, then select the copy destination and press the Ctrl + V keys. (Copy + paste) |
| Delete | | — | Select an element to delete, and press the Delete key. The elements that were connected to the deleted elements are automatically connected. ^{*3}) |
| Connection line | To connect | Click a connection point, and drag it to a target connection point. | Select a connection point or selection line. Then, move the cursor to a target connection point by pressing the Ctrl + ← / → / ↑ / ↓ keys. |
| | To connect automatically ^{*3} | Click an element to be connected, and drag it closer to a target connection point. However, even if an element gets closer to another element when changing the size of the element, they are not connected. | — |
| | To replace | Select a connection line with the Shift key held down, and drag and drop it on the connection point of an element. | Select a connection point or selection line. Then, move the cursor to a target connection point by pressing the Ctrl + Shift + ← / → / ↑ / ↓ keys. |
| | To insert an element | Click an element, and drag and drop it to a connection line with the Shift key held down. (Only an element which has a connection point on the same level at the input/output side) | — |
| | To adjust manually | Click a connection line with the Ctrl key held down, and drag it to any position. | — |

*1 Multiple FBD network blocks can be selected by selecting an FBD network block after selecting multiple elements. For an element which is not connected another element, the selection is canceled.

*2 For function element and function block element, this follows the operation for double-clicking, which is selected from [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor."


*3 A function to connect elements automatically using a connection line. Enabling or disabling this function can be changed in the following menu, [Edit] ⇒ [Edit Mode] ⇒ [Element Auto-connect](.

Inserting an inline structured text element

Inline structured text is a function to edit or monitor an ST program by creating an inline structured text element that displays an ST program in an FBD/LD editor.

With this function, a numeric value operation or a character string process can be created easily in the FBD/LD program. In this manual, the ST program in an inline structured text element is referred to as an 'inline structured text program.'

Operating procedure

1. Select [Edit] ⇒ [Add Element (Ladder Symbol)] ⇒ [Inline Structured Text] ().



2. Double-click the inserted inline structured text element.

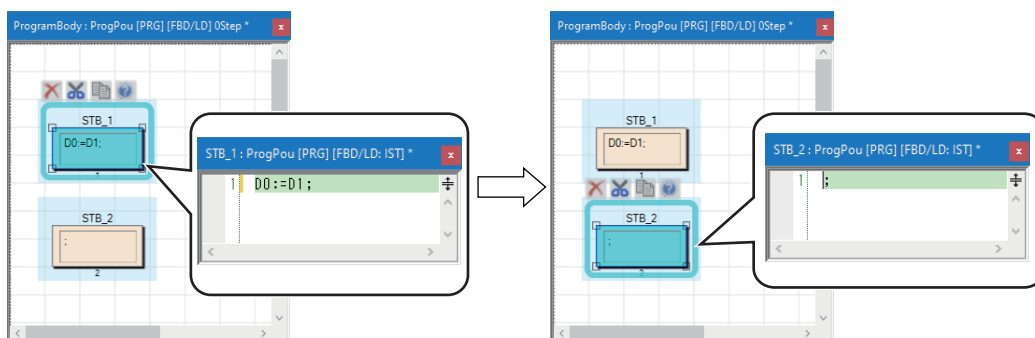
3. Enter an inline structured text program in the displayed ST editor.

The display contents and editing method of the inline structured text program are the same as those of ST program.

( Page 320 Creating an ST Program)

Point

- By entering '@STB' or 'STB' on the edit box, an inline structured text element can be inserted. ( Page 336 Using the edit box)
- Inline structured text elements can be copied and deleted in the same manner as other elements. ( Page 339 Common operations of elements)
- In an inline structured text program, a local label of an FBD/LD program using the inline structured text program can be used.
- An inline structured text program displayed in an ST editor can be switched by clicking another inline structured text element.



- When performing any of the following operations while an inline structured text program is displayed in an ST editor, the ST editor is displayed in gray:
 - Deleting an inline structured text element
 - Closing an FBD/LD editor in which an inline structured text element exists
 - Deleting an FBD/LD program in which an inline structured text element exists

Precautions

- When copying and pasting an inline structured text element to the same FBD/LD editor, it is pasted with a different data name.
- A conversion error occurs in the following cases:
 - An inline structured text element with the data name of "???" exists.
 - 65 or more inline structured text elements exist in one program block.
- Highlighting for the change tracking of an inline structured text program is cleared in the following cases:
 - An inline structured text element is deleted.
 - The data name of an inline structured text element is changed to "???" by undoing/redoin.
- The label of which data type is pointer cannot be used in the inline structured text program.

Displaying/setting FB properties

FB properties can be displayed and set in the "FB Property" window.

For details, refer to the following:

 Page 387 Display/setting an FB property

FB property management (offline)

Initial values of FB properties saved in a project can be exported to a CSV file in the "FB Property Management (Offline)" screen. In addition, the initial values of FB properties can be imported from the CSV file, and the values can be applied to the initial values of FB properties in the project.

For details, refer to the following:

 Page 408 FB property management (offline)

Replacing function elements/function block elements

Operating procedure

1. Select a function element/function block element.
2. Select [Edit] ⇒ [Change FB/FUN Data], and enter the data type to be changed.

Point



An element can also be replaced by dragging it from the element selection window and dropping it onto the element to be replaced.

For function elements, similarly, the data type can be changed by selecting a function element and entering a new data type directly.

Adding/deleting arguments

Only for a function of which the number of arguments can be changed, an argument can be added or deleted.

Operating procedure

1. Move the cursor on a function element.
2. Select [Edit] ⇒ [I/O Argument] ⇒ [Increment Argument] ()/[Delete Argument] ()

Hiding arguments

Arguments (input/output labels) of function elements/function block elements can be hidden.

The arguments that can be hidden are as follows:

- Arguments of a function element: ENO, VAR_OUTPUT
- Arguments of a function block element: ENO, VAR_INPUT, VAR_OUTPUT, VAR_OUTPUT_RETAIN

The following shows the operating procedure to hide arguments by using smart tags.

Operating procedure

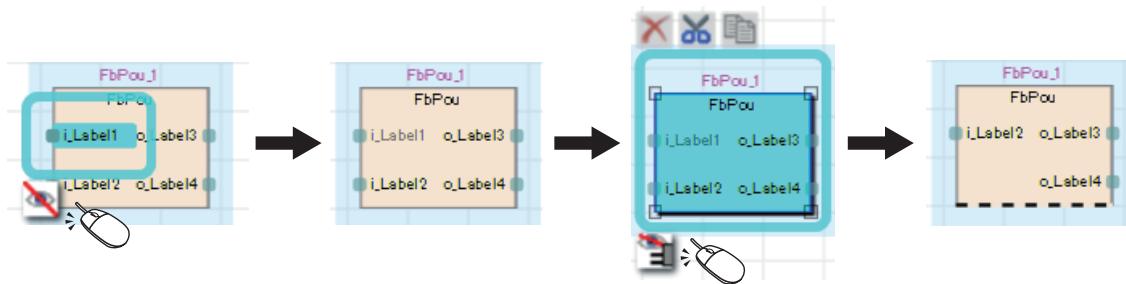
1. Select an argument to be hidden, and click  (Mark as Hidden). (Multiple selections allowed.)

The argument is set as a hidden target, and the color of its name is changed.




2. Select a function element/function block element, and click  (Hide Argument).

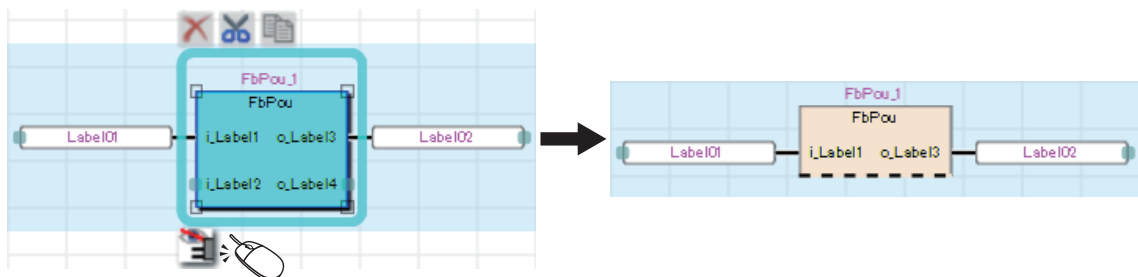
The argument which is set as a hidden target and also not connected to an element is hidden.

In addition, a dashed line is displayed under the function element/function block element.



Point

- An argument can be excluded from hidden targets by selecting the argument and clicking  (Unmark as Hidden).
- A hidden argument can be displayed again by selecting the function element/function block element and clicking  (Show Argument).
- Arguments can also be displayed or hidden by using the following menus:
 - [Edit] ⇒ [I/O Argument] ⇒ [Mark as Hidden]
 - [Edit] ⇒ [I/O Argument] ⇒ [Unmark as Hidden]
 - [Edit] ⇒ [I/O Argument] ⇒ [Hide Argument]
 - [Edit] ⇒ [I/O Argument] ⇒ [Show Argument]
- When there is no argument set as the hidden target, all arguments which are not connected to an element are hidden by clicking  (Hide Argument).



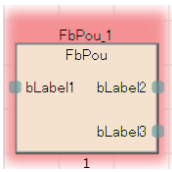
Precautions

- When switching whether to display or hide arguments, the program will be in the unconverted state. In this case, the program execution order may be changed.
- When changing data of a function element/function block element or updating the definition information after hiding arguments, all arguments are displayed.

In addition, the argument displayed in the same position as the one marked as hidden before changing/updating is set as the hidden target. (Excluding arguments which cannot be hidden)

FB/FUN whose definition is unclear

Once the definition of a function block element or function element is deleted or changed, the element is used as one whose definition is unclear and an error occurs when it is converted. The following shows a display example of a function block element whose definition is unclear.



When the definition of an element is changed, select the element, then select [Edit] ⇒ [Update FB/FUN] and update the definition information.

When the definition of an element does not exist, select the element, then select [Edit] ⇒ [Change FB/FUN Data] and change the data.

Adjusting position automatically

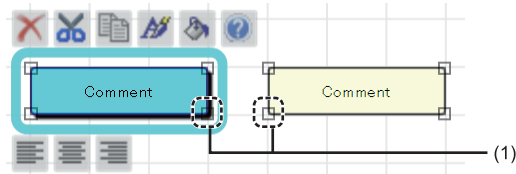
When an element is added or moved, the position is adjusted automatically to avoid the overlap with others.

When a rectangular area of an FBD network block (area added one cell for each directions, top, bottom, left, and right, of element connected using a connection line) overlaps with another area, the position is automatically arranged so that the entire blocks do not overlap.

However, comment elements can be superimposed since it is not subject for the automatic adjustment.

Changing the element size

Grips (1) are displayed as shown below by selecting a comment element, inline structured text element, function element, or function block element, or by placing the cursor on the frame of an element. The size of each element can be changed by using the grips.



Operating procedure

■Comment element/inline structured text element

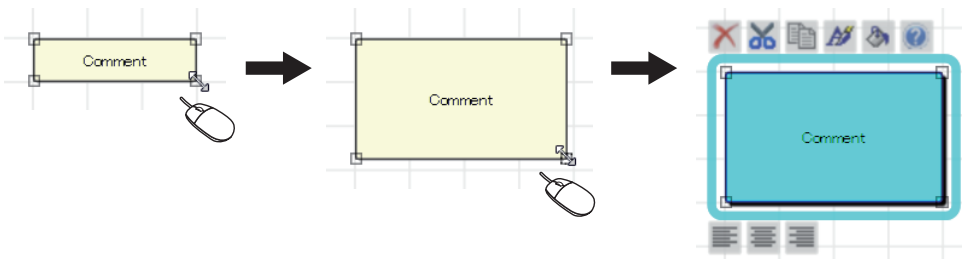
1. Place the cursor on the frame of an element where the grips are displayed.

The icon of the cursor changes.

2. Move the cursor vertically and horizontally with the frame being held.

(For a comment element, the height and width must be one cell minimum, but there is no limitation on the maximum size.)

(For an inline structured text element, the height must be between 2 and 20 cells, and the width between 3 and 30 cells.)



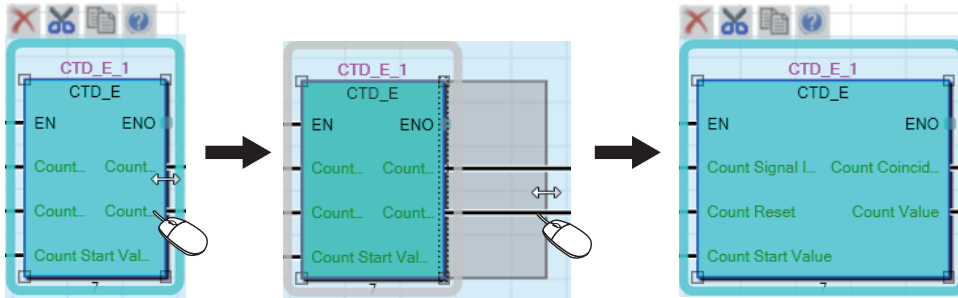
■Function element/function block element

1. Place the cursor on the frame of an element where the grips are displayed.

The icon of the cursor changes.

2. Move the cursor vertically and horizontally with the frame being held. (Width: 3 cells minimum, 30 cells maximum)

The operation can be canceled by pressing the **Esc** key while moving the cursor.



Point

The size of an element can be adjusted automatically by double-clicking the frame of the element with its grips being displayed. (For a function element or function block element, the size will be adjusted so that the character strings of its data type and input/output labels are fully displayed.)

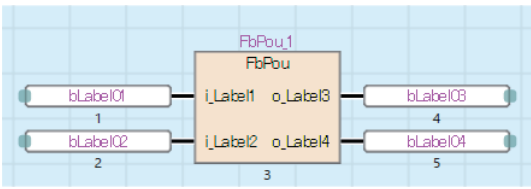
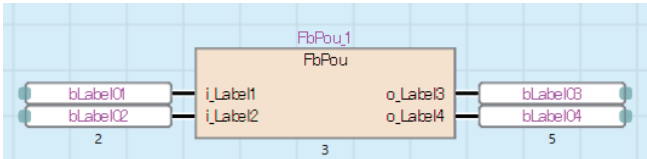
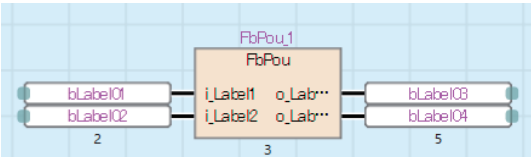
Precautions

Once the size of an element is changed, the program will be in the unconverted state.

Changing the height of an element

The space between input/output labels and variable elements can be adjusted, and the heights of function elements and function block elements can be changed.

The height can be selected from the following two types.

| Type | Description | Display example |
|---------|---|--|
| Normal | Input/output labels and variable elements are displayed with the default spacing. |  |
| Compact | Input/output labels and variable elements are displayed with less spacing than the default. | <ul style="list-style-type: none"> When adapting the width according to the input/output labels  <ul style="list-style-type: none"> When keeping the width according to the input/output labels  |

The following shows the operating procedure to change the height of a function element and a function block element.

Operating procedure

1. Select a function element or a function block element. (Multiple selections allowed.)
2. Right-click it and select [Edit] ⇒ [Toggle FB/FUN Height] ⇒ [Adapt Width]/[Keep Width] from the shortcut menu.

Point

In an FBD/LD editor, the height can also be changed by selecting the following menu:

- [Edit] ⇒ [Toggle FB/FUN Height] ⇒ [Adapt Width]/[Keep Width]

By setting "Normal" or "Compact" for the following options, the height of a function element and a function block element to be added can be set in advance.

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "FB/FUN height"
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "FB/FUN height"

Precautions

If switching to the compact height, the execution order number may be hidden depending on the position of variable elements.

Order of comment elements

When comment elements are overlapped, the comment element added later is displayed at the front.

The order of comment elements can be changed in [Edit] ⇒ [Order Comment] ⇒ [Bring to Front]/[Bring Forward]/[Send Backward]/[Send to Back].

After changing the order of comment elements, the elements will be in the unconverted state.

Layout correction

Operating procedure

■Inserting a row

Select a cell in a row to be inserted, then select [Edit] ⇒ [Layout] ⇒ [Insert Row].

A new row is inserted on the selected cell.

■Deleting a row

Select a cell in a row to be deleted, then select [Edit] ⇒ [Layout] ⇒ [Delete Row].

The row including the selected cell is deleted. When the row includes any elements, the row cannot be deleted.

■Inserting/deleting a column

Move the cursor onto an FBD network block in which a column will be inserted/deleted, then select [Edit] ⇒ [Layout] ⇒ [Insert Column(in FBD Network Block)]/[Delete Column(in FBD Network Block)].

A column is inserted/deleted in the range of the FBD network block.

■Inserting multiple rows

Select a cell in a row to be inserted, then select [Edit] ⇒ [Layout] ⇒ [Insert Multiple Rows].

Enter the number of rows to be inserted in the "Insert Multiple Rows" screen.

A new row is inserted on the selected cell.

■Deleting multiple rows

Select a cell in a row to be deleted, then select [Edit] ⇒ [Layout] ⇒ [Delete Multiple Rows].

Enter the number of rows to be deleted in the "Delete Multiple Rows" screen.

The number of rows that has been set above is deleted from the row under the selected cell.

When the rows to be deleted include any element, a row upper than the row in which the element exists is deleted.

■Correcting layout in an FBD network block

Select an FBD network block including elements to be corrected, and select [Edit] ⇒ [Layout] ⇒ [Layout Correction in FBD Network Block].

The layout in the selected FBD network block is corrected.

■Correcting layout in an FBD network block in a batch

Select [Edit] ⇒ [Layout] ⇒ [Batch Correction of Layout in FBD Network Block].

The layout of all the FBD network blocks in the worksheet is corrected.

■Deleting a blank row between FBD network blocks

Select [Edit] ⇒ [Layout] ⇒ [Delete the Blank Row Between FBD Network Blocks].

The row between an FBD network block or elements will be deleted.

■Aligning FBD network blocks to the left side in a batch

Select [Edit] ⇒ [Layout] ⇒ [Batch Alignment of All FBD Network Blocks to the Left].

All FBD network blocks can be aligned to the left side of an FBD/LD editor.

When multiple FBD network blocks are included on the same line, the blank column between the blocks are retained.

■Correcting the layout of all FBD/LD editors in a batch

Select [Edit] ⇒ [Layout] ⇒ [Batch Correct All FBD/LD Editors].

The following operations are performed for all FBD/LD editors in a project:

- Linking comments in a batch
- Correcting the layout in an FBD network block in a batch
- Deleting a blank row between FBD network blocks
- Aligning FBD network blocks to the left side in a batch

The details of 'Layout Correction in FBD Network Block' and 'Batch Correction of Layout in FBD Network Block' can be set in the following option.

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FBD Network Block" ⇒ "Layout Correction in FBD Network Block"

Precautions

■Execution order after correcting layout

When 'Layout Correction in FBD Network Block' or 'Batch Correction of Layout in FBD Network Block' is performed, the size or position of FBD network blocks is changed and that may cause the change of execution order.

Display the execution order to check if the order is changed before and after the layout change.

If the execution order is changed, move the position of the elements manually.

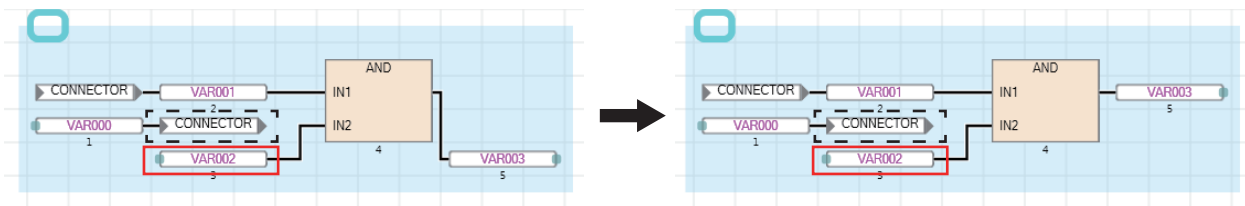
■Situations where the layout cannot be corrected

Depending on the position of elements or option settings, 'bent connectors' and 'variable element that is connected to a function block or function' may not be arranged even when 'Layout Correction in FBD Network Block' or 'Batch Correction of Layout in FBD Network Block' is performed.

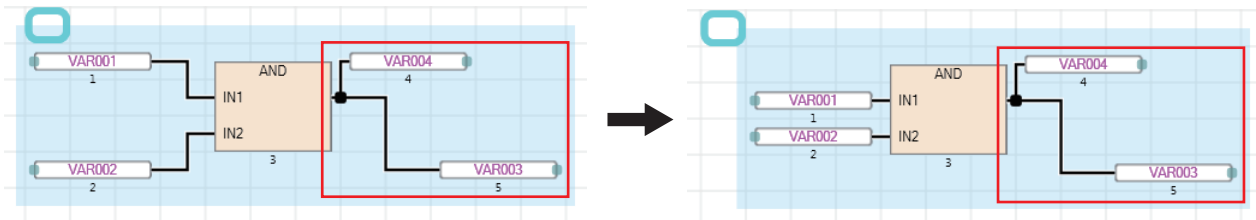
If the layout is not corrected after 'Layout Correction in FBD Network Block' is performed repeatedly, the elements should be moved manually.

A variable element ^{*1} is not corrected in the following situations.

- Another element was already placed in the position where an element is to be moved.



- Two or more variable elements are connected to one input or output argument.



^{*1} Whether or not to move a variable element can be set in the following option.

[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FBD Network Block" ⇒ "Layout Correction in FBD Network Block" ⇒ "Move the Position of Variable Elements to Connect to FB/FUN"

Pasting from each screen

A label name/device name can be pasted by dragging and dropping in a label editor and device comment editor.

Registering an undefined label

When entering an undefined label, the "Undefined Label Registration" screen appears and the label can be registered in a label editor. (Page 257 Registering an undefined label)

Utilizing a tag FB

This section explains the method for utilizing a tag FB in an FBD/LD program for process control.

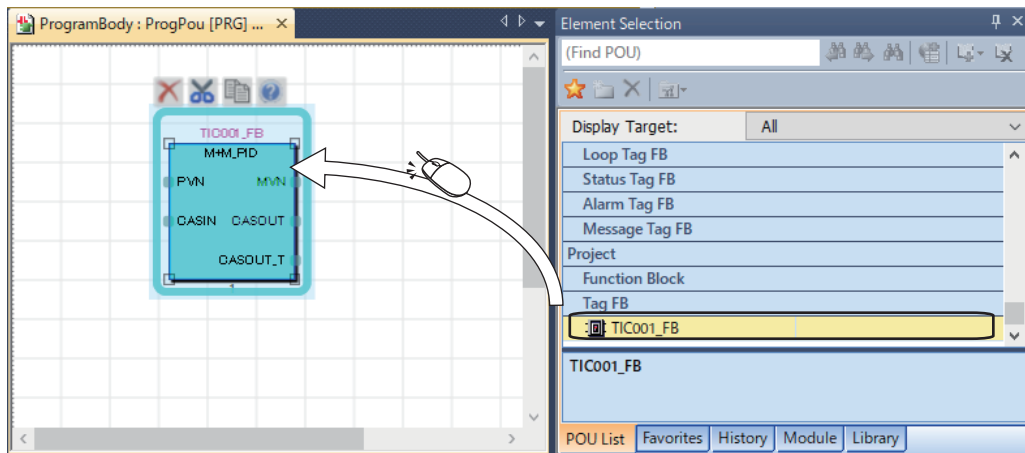
A tag FB is required to be registered on the tag FB setting editor in advance.

For details on registration of tag FBs, refer to the following:

☞ Page 260 Registering Tag FBs

Operating procedure

1. Select an FB instance in the element selection window, then drag and drop it onto an FBD/LD editor.
2. Connect the tag FB instance to an input variable and an output variable.



Linking a comment

A comment element is simultaneously moved with an element by linking them.

A comment link can be set for an element except for a connection line, input/output argument of an FB/FUN, and comment element.

Multiple comment elements can be linked with a single element.


The link of a comment element can be set only for a single element.

To change the link of a comment element to another, release the link first.

Linking a comment element with a single element

Set a link between a comment element and an element.

Operating procedure

1. Select a comment element and a single element. (Multiple selections allowed only for comment elements.)
2. Select [Edit] ⇒ [Easy Edit] ⇒ [Link Comment] ().


After this setting, the background of the linked comment element is changed.

Releasing links

Releasing the links between a comment element and an element.

All links can be released by selecting an element linking with multiple comment elements and releasing them.

Operating procedure

1. Select a comment element linking with an element.
2. Select [Edit] ⇒ [Easy Edit] ⇒ [Unlink Comment] ().

After the setting, the link between a comment element and an element is released and the background color of the comment element is restored.

Linking comment elements and elements in a batch

Set the links of unlinked comment elements in a batch in the active FBD/LD editor.

Operating procedure

Select [Edit] ⇒ [Easy Edit] ⇒ [Comment Batch Link].

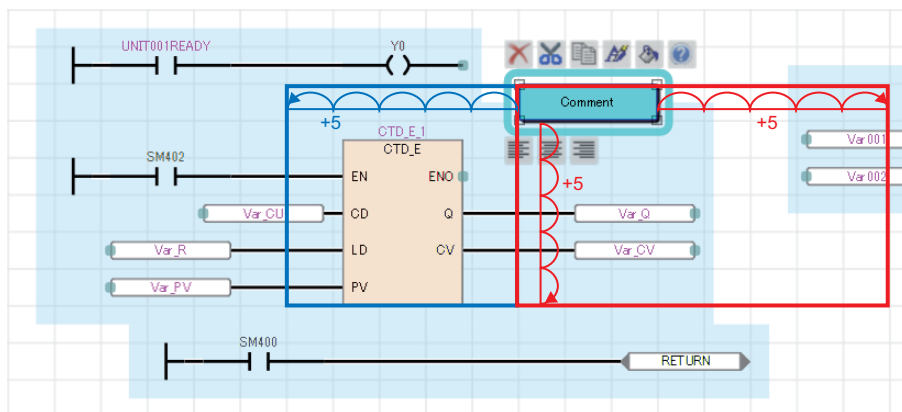
After this setting, the background of the linked comment element is changed.

■Conditions for determining the link target of a comment in a batch linking

In a batch linking, a comment element is automatically linked with an element that satisfies the following conditions in the order mentioned below.

1. The link is set to the closest element that is found by searching in the red frame (range with a width of one comment element and five cells to the right and the depth of the comment element and five cells downward). It is searched from the upper left of the range to lower right.
2. When no element is found in the procedure above, the link is set to the closest element that is found by searching in the blue frame (range with five cells to the left from one comment element and a depth of the comment element and five cells downward). It is searched from the upper right of the range to lower left.

Any link is not set if no element that is to be the link target is found in the conditions above.



Operation when linking comments

■Selecting a single element in ones with links

By selecting an element with a link, all elements linking with it are selected.

To select one element without releasing the link, click the target element twice or select it with **Ctrl** held down.

■Editing an element with a link

When copying a comment element and element that link each other, the link is remained after the copy.

When deleting a comment element or element that link each other, the link is released.

■Correcting the element layout

When arranging the element layout by the following menu, the comment element linking with the element does not synchronize with it.

- [Edit] ⇒ [Layout] ⇒ [Insert Row]
- [Edit] ⇒ [Layout] ⇒ [Delete Row]
- [Edit] ⇒ [Layout] ⇒ [Insert Column(in FBD Network Block)]
- [Edit] ⇒ [Layout] ⇒ [Delete Column(in FBD Network Block)]
- [Edit] ⇒ [Layout] ⇒ [Insert Multiple Rows]
- [Edit] ⇒ [Layout] ⇒ [Delete Multiple Rows]

Displaying FBD network blocks in a list

FBD network blocks in the active FBD/LD editor are displayed in a list.

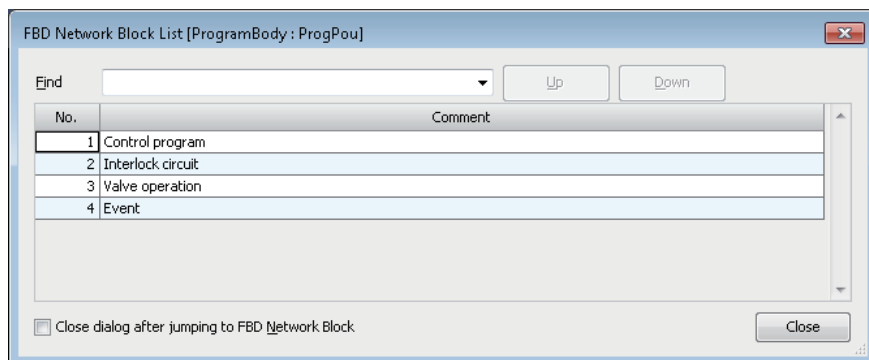
To display a comment in the FBD network block list, the comment needs to link with the element of the FBD network block.

For details on the link of comments, refer to the following:

☞ Page 349 Linking a comment

Window

Select [Find/Replace] ⇒ [FBD Network Block List].



Displayed items

| Item | Description |
|---------|--|
| No. | An FBD network block number*1 is displayed. |
| Comment | An element in the FBD network block and a comment linking with the element are displayed. When multiple comments are set to the linking element, the comment placed at the uppermost in the left side is displayed. Up to 500 characters can be displayed. |

*1 Select the following menu to display an FBD network block number on an FBD/LD editor.
[View] ⇒ [FBD Network Block No. Display]

Operating procedure

■ Jumping to an FBD network block

Double-click the row of an FBD network block to jump.

To close the "FBD Network Block List" screen after the jump, select the checkbox of "Close dialog after jumping to Network.".

■ Searching for an FBD network block

Enter an FBD network block No. or a comment to search for, click the [Upward Search]/[Downward Search] button.

Searching for/replacing data in a program

The search functions that can be used in FBD/LD editor are as follows.


| Function name | Description | Reference |
|------------------|---|-----------------------------|
| Cross reference | To check a declaration location and a reference location of a device and a label in a list. | Page 460 SEARCHING FOR DATA |
| Device list | To check the usage of devices being used. | |
| Find and replace | <ul style="list-style-type: none">• To search for and replace a device name, label name, instruction name, and character string.• To change contacts between open contact and close contact• To replace devices in a batch. | |

Displaying Help


The elements used in an FBD/LD program can be checked in e-Manual Viewer.

To check the elements, the file of the corresponding manual must be registered in e-Manual Viewer.

Operating procedure

1. Select the element to be checked.
2. Press the  key.





If a function block or function is associated with a help file, the help file opens. ( Page 141 Associating data with a help file)

6.6 Creating an SFC Program

This section explains the creation method of SFC program.

The details on the specification of SFC program are described in the following manual. Please read it in advance.






 MELSEC iQ-R Programming Manual (Program Design)

 MELSEC iQ-F FX5 Programming Manual (Program Design)

Point

The display format and detailed operation settings for each function can be set by setting the following option.
[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor"

Creation procedure

1. Set the point of step relay (S) in "Device Setting" of "CPU Parameter." (The default is set as 0 points.)
 2. Create new SFC data. ( Page 132 Creating data)
 3. Configure the following settings if needed.
 - "SFC Setting" in CPU parameters
 - 'Act at Block Multi-Activated' which is set for a program file
 - 'SFC information device' which is set for a block (block information)
- For details, refer to the following:
-  MELSEC iQ-R Programming Manual (Program Design)
-  MELSEC iQ-F FX5 Programming Manual (Program Design)
4. Open an SFC diagram editor, then create an SFC diagram. ( Page 361 Creating SFC diagrams)
 5. Edit a program of action/transition. ( Page 381 Creating/displaying Zooms (action/transition))

Configuration of an SFC diagram editor

An SFC diagram editor is a graphical language editor to show a sequence control as a state transition diagram. By simply inserting the prepared SFC elements along the operation flow, the each element is connected automatically and a program can be created.

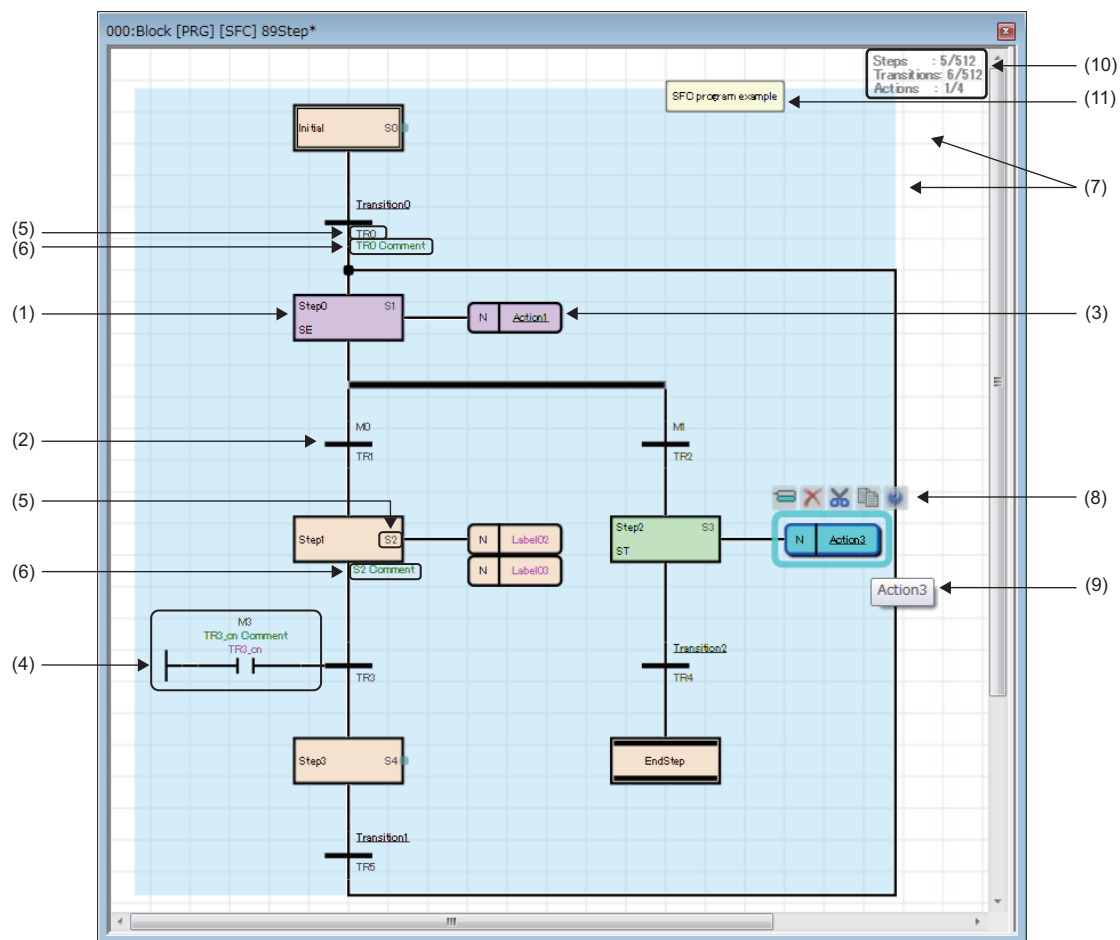
Window

Select "Program" ⇒ "(execution type)" ⇒ "(program file)" ⇒ "(block)" ⇒ "ProgramBody" in the navigation window. Immediately after creating a program, SFC elements that are necessary to create a program such as an initial step and end step are placed.

■Toolbar



■SFC diagram editor



Displayed items

| Item | | Description | Editing operation |
|---|-----------------------------|---|---|
| SFC element | (1) Step | Indicates one processing of a program. | ■Entering: Page 361 Inserting initial steps, Page 362 Inserting/editing normal steps ■Displaying a start destination block: [View] ⇒ [Open Zoom/Start Destination Block] |
| | (2) Transition | Indicates a condition (transition conditions) to move to the next step. Transitions are written in a Zoom or on an SFC diagram, and they can be displayed in multiple formats. For details, refer to the following: 📖 Page 358 Display format of action/transition | ■Entering: Page 364 Inserting/editing transitions ■Displaying a start destination block: [View] ⇒ [Open Zoom/Start Destination Block] |
| | (3) Action ^{*1,*2} | Indicates an assigned operation output to a step. Actions are written in a Zoom or an SFC diagram, and they can be displayed in multiple formats. For details, refer to the following: 📖 Page 358 Display format of action/transition | ■Entering: Page 366 Inserting/editing actions ■Displaying a start destination block: [View] ⇒ [Open Zoom/Start Destination Block] |
| (4) FBD/LD element | | An FBD/LD element that can be used only for a transition. 📖 Page 332 Elements The elements that can be used on an SFC diagram differs from the one for an FBD/LD editor. For details, refer to the following: 📖 MELSEC iQ-R Programming Manual (Program Design) 📖 MELSEC iQ-F FX5 Programming Manual (Program Design) | ■Editing method: Page 336 Entering programs |
| (5) Step No./Transition No. ^{*1} | | An assigned number to a step/transition automatically by conversion. A step relay (S) of a CPU module is assigned to a step. A step No. (S□) is used for SFC control instructions, the current value change with the monitor function or in a watch window, and the data logging/memory dump function. The assigned number can be changed. | ■Changing an assigned number: Page 380 Editing Step No./Transition No. |
| (6) Device comment ^{*1} | | The device comment of a Step No. (S□)/Transition No. (TR□) is displayed. The device/label comment which was set to transitions/actions is not displayed. | ■Entering: Page 362 Entering comments of Step No., Page 366 Entering comments of Transition No. |
| (7) Grid ^{*1} | | A grid line that serves as makers to place the elements | — |
| (8) Smart tag ^{*2} | | An operation button displayed around a selected element. Relevant functions can be performed by clicking the button. | — |
| (9) Tool hint ^{*2} | | Information where the mouse cursor is placed over is displayed. | — |
| (10) Information area | | "Number of used/maximum number" of SFC elements are displayed. The font color is changed in red when the number of used reached to the maximum number. SFC elements cannot be created once the number reached to the maximum number. In that case, arrange the number of elements, for example, by deleting. | — |
| (11) Comment element | | Comments can be put on an SFC editor. The comments does not affect to the program. The frame size of a comment can be adjusted for the comment length by placing the mouse cursor on the frame and double-clicking it. | — |

*1 Shown or hidden by selecting in the [View] menu.

*2 Shown or hidden according to the setting in [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor."

Point

Font color, background color, and font can be changed.

However, for a comment element, only font color and background color can be changed.

📖 Page 82 Checking and Changing Colors and Fonts

By pressing the [Ctrl] + [↑]/[↓]/[→]/[←] keys, the cursor can be moved on the editor without selecting elements.

Precautions

When the following contents are changed by using a menu or setting an option, the display of a label name, device, comment, or assigned device of an element may overlap with those of another element. In that case, arrange the position of those elements.

- Whether or not to display a device/label comment
- Number of rows to display a device/label comment
- Number of cells for device/label name
- Whether or not to display an assigned device
- Number of rows to display a device/label name by wrapping it around

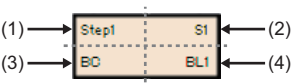

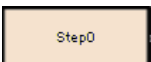






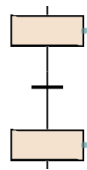
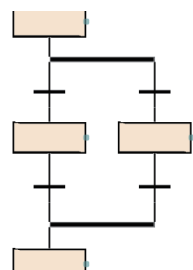
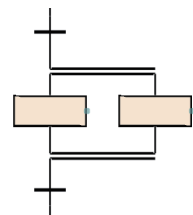
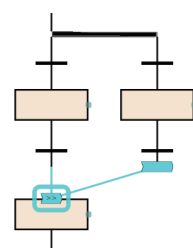
SFC elements


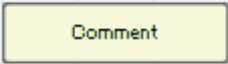

The following shows elements which can be used in an SFC program.

For details on creatable numbers of block/each element, action, and each element, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

| Item | | Description | | |
|------|--|---|---|---|
| Step |  (1) Step name (2) Step No. (S□) (3) Step attribute (4) Step attribute target | <div>■Initial step</div>  <div>■Normal step</div>  <div>■End Step</div>  | <p>Indicates the head of a block. One initial step is necessary for a block.</p> <p>Multiple initial steps can be created to perform multiple processes in parallel.</p> <p>The operation of a step can be changed by specifying the step attribute. For details, refer to the following:</p> <p> MELSEC iQ-R Programming Manual (Program Design)</p> <p> MELSEC iQ-F FX5 Programming Manual (Program Design)</p> <p>Once a transition that places under a step is satisfied, the next step is activated.</p> <p>The operation of a step can be changed by specifying the step attribute. For details, refer to the following:</p> <p> MELSEC iQ-R Programming Manual (Program Design)</p> <p> MELSEC iQ-F FX5 Programming Manual (Program Design)</p> <p>Indicates the end of a block.</p> <p>Step No. is not assigned to an end step.</p> | |
| | Transition |  (1) Transition name (2) Transition No. (TR□) | <div>■Series transition</div>  <div>■Selection branch</div>  <div>■Simultaneous branch</div>  <div>■Jump</div>  | <p>Moves the processing to a next step.</p> <p>Indicates a branch displayed with a single line for selecting one processing.</p> <p>Indicates a branch displayed with a double line and performs multiple processes in parallel.</p> <p>Makes the execution processing jump to the specified step in the same SFC block.</p> <p>A jump and a connection line can be switched.</p> |

| Item | Description |
|--|---|
| <p>Action</p> <p>(1) →  (2)</p> <p>(1) N: Qualifier (2) Action name</p> | <p>Once the steps are activated, the assigned action will be executed.</p> <p>'N' indicates that an action perform when the step is activated. Other than 'N' cannot be set.</p> |
| <p>Comment element</p> <p></p> | <p>It is used to enter a comment.</p> <p>Up to 2000 characters can be entered in a comment element.</p> <p>The frame size of a comment can be adjusted for the comment length by placing the mouse cursor on the frame and double-clicking it.</p> <p>For setting color for individual comment elements, refer to the following:  Page 334 Common element</p> |

Display format of action/transition

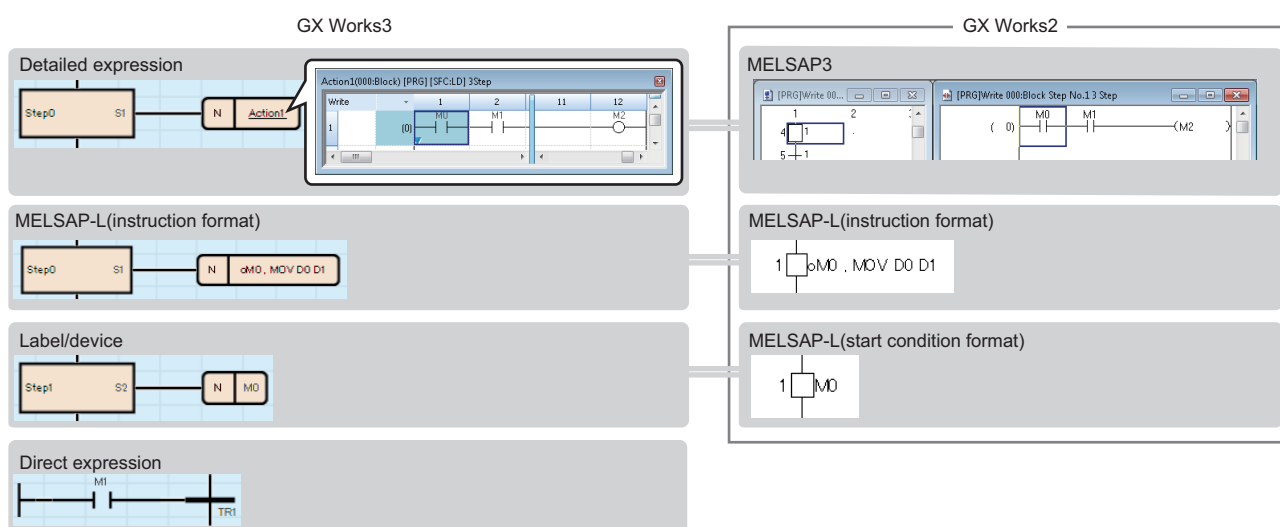
There are multiple display formats (types) for actions/transitions on an SFC editor in GX Works3.

Programs can be shown in the equivalent display formats to MELSAP3, MELSAP-L (instruction format), and MELSAP-L (start condition format) in GX Works2 by changing the display formats (type).

| Target SFC element | Display format in GX Works3 (type) | | | Display format in GX Works2 | Reference |
|--------------------|--|----------------------|---|-----------------------------------|---|
| Action, transition | Detailed expression (create a Zoom) | Ladder* ¹ | Detailed expression | MELSAP3 | Page 365 Creating a transition Page 366 Creating an action |
| | | | MELSAP-L (instruction format)* ² | MELSAP-L (instruction format) | |
| | | ST, FBD/LD | | — | |
| | Label/device | | | MELSAP-L (start condition format) | |
| Transition | Direct expression | | | — | |

*¹ Switch in [View] ⇔ [Switch Ladder Display].

*² FX5CPUs do not support it.



- Action name/transition name is underlined when selecting the detailed expression in the switch ladder display.
- For the direct expression, "" is displayed to the transition name that an FBD/LD element is not connected.
- When changing from "Detailed Expression" to "MELSAP-L (Instruction Format)" in [Switch Ladder Display], "???????" is displayed for an instruction which cannot be treated in MELSAP-L (instruction format).
- When a Zoom does not exist in MELSAP-L (instruction format), "?" is displayed.

■Changing the display format (type) of a transition

The file size of a project can be reduced by changing the display format of a transition (Zoom) created in Ladder Diagram language.

The following shows the procedure to change the display format.

Operating procedure

1. Open an SFC diagram editor.
2. Select [Edit] ⇒ [Change Type of Transition].
3. Set each item in the "Change Type of Transition" screen, and click the [OK] button.

The display format of a transition (Zoom) that consists only of one open contact and 'TRAN' or of one close contact and 'TRAN' is changed as follows:

| Before change | After change |
|-------------------------------|--------------|
| Detailed expression | Label/device |
| MELSAP-L (instruction format) | |

The display format of a transition (Zoom) without contacts is changed as follows:

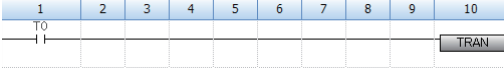

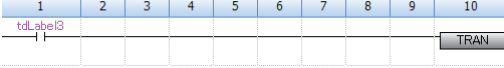

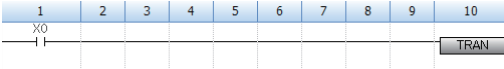

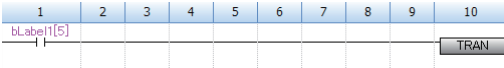
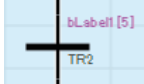
| Before change | Setting content for type change | After change | |
|---------------------------------|---------------------------------|--------------|-------------|
| | | Type | Description |
| A ladder block without contacts | Use TRUE | Label/device | TRUE |
| | Use SM400 | | SM400 |

Precautions

- The display format of an unused Zoom will not be changed.
- If the display format is changed, a Zoom will be deleted and an SFC program will be in the unconverted state.
Convert all the unconverted SFC programs.
- If a security is set for a program file, the display format of a transition cannot be changed.
However, it can be changed if the security is disabled.
- If an SFC block is read-only or unconverted, the display format of a transition cannot be changed.

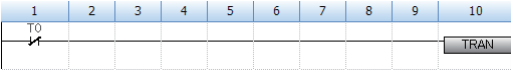
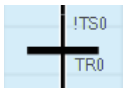
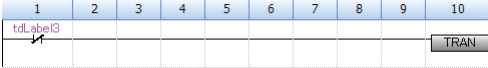

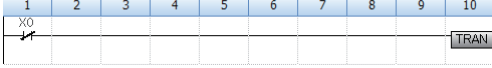
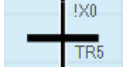
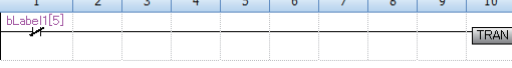

Ex.

The following table shows examples of how open contacts are changed:

| Type | Description | Example | |
|----------------------------------|--|--|---|
| | | Before change | After change |
| Timer device Counter device | They will be changed to the following devices: • T→TS • ST→STS • LT→LTS • LST→LSTS • C→CS • LC→LCS | Timer device: T0  | TS0  |
| Timer type or counter type label | The label name will be suffixed with '.S.' | Timer type label: tdLabel3  | tdLabel3.S  |
| Other devices | Only the display format will be changed. No change will be made in the device name. | Bit type device: X0  | X0  |
| Other labels | Only the display format will be changed. No change will be made in the label name. | Bit type label: bLabel1[5]  | bLabel1[5]  |

Ex.

The following table shows examples of how close contacts are changed:

| Type | Description | Example | |
|----------------------------------|---|--|--|
| | | Before change | After change |
| Timer device Counter device | They will be changed to the following devices: The device name will be prefixed with '!.' <ul style="list-style-type: none"> • T→!TS • ST→!STS • LT→!LTS • LST→!LSTS • C→!ICS • LC→!LCS | Timer device: T0  | !TS0  |
| Timer type or counter type label | The label name will be prefixed with '!' and suffixed with '.S.' | Timer type label: tdLabel3  | !tdLabel3.S  |
| Other devices | The device name will be prefixed with '!.' | Bit type device: X0  | !X0  |
| Other labels | The label name will be prefixed with '!.' | Bit type label: bLabel1[5]  | !bLabel1[5]  |

Creating SFC diagrams

This section explains the creation method of an SFC diagram.

Elements which can be inserted differ depending on selected places.

Since the size or place of each element/connection line are placed automatically, it cannot be freely changed.

Precautions

When the contents shown below were entered/selected, a red frame appears in the edit box and the settings cannot be configured.

- Duplicate step name/Step No./Transition No.
- Unusable step attribute
- Step name which cannot be specified as a jump destination


Inserting initial steps

An initial step is inserted when creating a new SFC program.

Add an initial step to perform multiple processes in parallel.

FX5CPUs do not support this addition of an initial step.

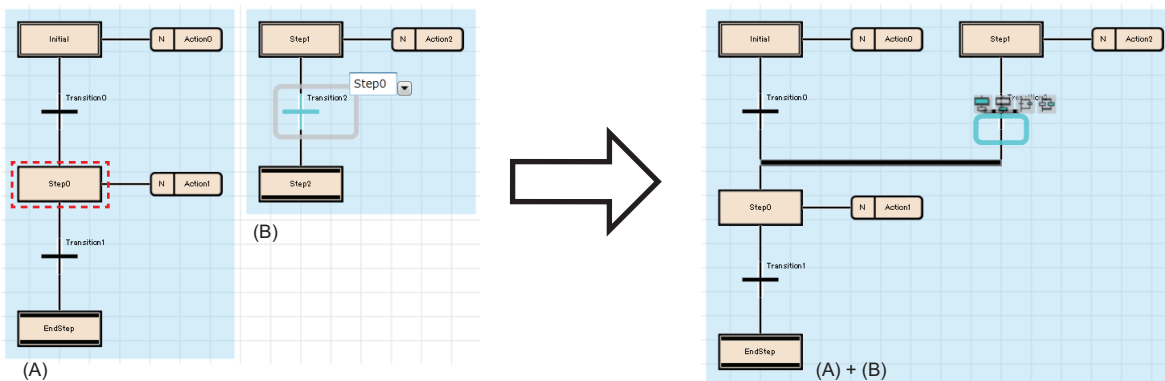
■ Adding initial steps

Select [Edit] ⇒ [Insert] ⇒ [Step] () on a blank cell.

An SFC diagram that consists of an initial step, transition, and end step is inserted.

When connecting multiple SFC diagrams (A, B), perform the following operation.

1. Select the transition in the SFC diagram (B), and select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].
2. Select the step name to be connected on the SFC diagram (A).
3. Select a jump, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].



For the connection method to a simultaneous branch, refer to the following:


 Page 367 Inserting/editing jumps (connection lines)

For the editing method of steps, refer to the following:


 Page 362 Inserting/editing normal steps

Inserting/editing normal steps

■ Inserting a normal step

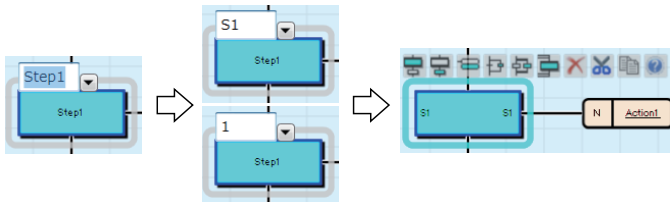
Select a step/transition/jump, then select [Edit] ⇒ [Insert] ⇒ [Step] ().

■ Changing a step name/step No./step attribute/step attribute target

- Using a shortcut key (Step names only can be changed):
Select a step, and press the **F2** key.
- In the "Step Properties" screen:
Select a step, then select [Edit] ⇒ [Properties].
- From the menu:
Select a step, then select [Edit] ⇒ [Modify] ⇒ [(each item)].
- Double-click:
Double-click a step. The target to be changed differs depending on the place double-clicked ( Page 357 SFC elements).

Point

By entering a Step No./number to the edit box for changing a step name, the entered number is set as the step name or the Step No.



■ Changing a normal step to an end step

Select a step to be changed, then select [Edit] ⇒ [Modify] ⇒ [End Step/Jump].

All SFC diagram written below the changed step are deleted.

■ Entering comments of Step No.

Enter a comment in the "Step Properties" screen or in a device comment editor.

■Creating a step that makes another block activated

A step that activates another block when a step was activated (block start step) is creatable.

1. Insert a step.
2. Specify 'BC' or 'BS' for the step attribute.
3. Specify a block No. to be activated for the step attribute target.

To check the step, which is to be the specification source, from the block specified as the step attribute target, select [View] ⇒ [Open Start Source Block].

For details on the performance of step attribute (BC/BS), refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

■Creating a step that makes a step being held deactivated

A step that deactivates a step being held when a step was activated (reset step) is creatable.

1. Insert a step.
2. Specify 'R' for the step attribute.
3. Specify a step name of which the step is to be deactivated for the step attribute target.

When 'S999' is specified, all steps being held in the block are the target.

For details on the performance of step attribute (R), refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Inserting/editing transitions

■ Inserting a transition

Select a step/transition/jump, then select [Edit] ⇒ [Insert] ⇒ [Transition] (📌).

■ Changing a transition name/Transition No.

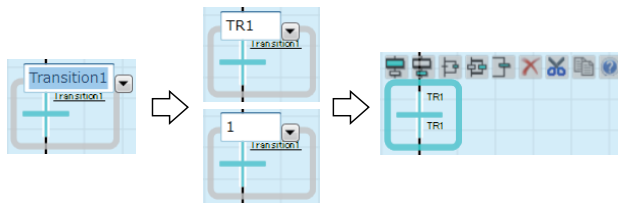
- Using a shortcut key (Transition names only can be changed):
Select a transition, and press the **F2** key.
- In the "Transition Properties" screen:
Select a transition, then select [Edit] ⇒ [Properties].
- From the menu:
Select a transition, then select [Edit] ⇒ [Modify] ⇒ [Name]/[Device].
- Double-click:
By double-clicking a Transition No. (👉 Page 357 SFC elements), it can be changed. By double-clicking a transition name, the Zoom is created/displayed.

For a transition that a Zoom has been created, the data name of Zoom will not be changed if the transition name was changed.

Modify the data name to match with the transition name in the "Zoom List" screen. (👉 Page 383 Displaying a Zoom list)

Point

By entering a Transition No./number to the edit box of which the transition name is to be changed, the entered values are set as the transition name and the transition No.





■Creating a transition

There are five ways of creation methods of a transition.

Each transition has a different type. The type can be checked in the "Transition Properties" screen.

"Detailed Expression" or "MELSAP-L (Instruction Format)" for the ladder display method can be switched in [View] ⇒ [Switch Ladder Display].

| Creation method | Type | Operating procedure |
|--|---------------------|--|
| Create a condition with a program (ladder, ST, FBD/LD). Describe a program in a Zoom. | Detailed expression |  Page 381 Creating Zooms (detailed expression) |
| Create a condition with a program (instruction format of a ladder). Describe a program in the properties. | Detailed expression |  Page 382 Creating Zooms (MELSAP-L (instruction format)) |
| Use TRUE/FALSE as conditions. Describe a transition on an SFC diagram. | Label/device | Select a transition, then enter TRUE/FALSE in the transition name. |
| Use ON/OFF of bit device/bit type label as conditions. Describe a transition on an SFC diagram. | Label/device | Select a transition, then enter the name of any of the following devices and label as the transition name.*1 <ul style="list-style-type: none"> • Bit device • Bit-specified word device • Bit type label |
| Create a condition with an FBD/LD element. Describe a transition on an SFC diagram. | Direct expression | Select [Edit] ⇒ [Modify] ⇒ [Direct Expression for Transition], then connect with an FBD/LD element. |

*1 A device/label can be used as a close contact by prefixing the device/label name with '!'.

(Example: Enter '!X0' to use X0 as a close contact.)

When changing the transition type from the direct expression to the detailed expression, the data name of the transition is assigned automatically.

The data name may not be returned when changing the transition type from the detailed expression to the direct transition and changing to the detailed expression again.

(Example: Detailed expression (TRAN1) → direct expression (*) → detailed expression (Transition5))

In this case, select [Edit] ⇒ [Undo], or set the data name again.

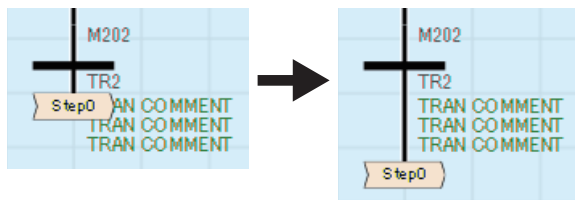
■Entering comments of Transition No.

Enter a comment in the "Transition Properties" screen or in a device comment editor.

Point

When a comment of transition No. overlaps with a jump symbol or connection line, the size of the transition can be changed by selecting the following menu with one or more transitions being selected.

- [Edit] ⇒ [Modify] ⇒ [Toggle Transition Size]



Inserting/editing actions

■Inserting an action

Select a step/an action, then select [Edit] ⇒ [Insert] ⇒ [Action] ().

Multiple actions can be inserted in a step.

Point

If all actions in a step are deleted, a transition is only checked all the time while a step is activated. Once the transition was satisfied, the next step is activated.

Steps without actions can be used when synchronizing the steps that are performing simultaneously etc.

■Changing an action name

Click the action, then select [Edit] ⇒ [Modify] ⇒ [Name]/press the **[F2]** key.

For an action that a Zoom has been created, the data name of Zoom will not be changed if the action name was changed.

Change the data name to match with the action name in the "Zoom List" screen. (Page 383 Displaying a Zoom list)

■Creating an action

There are three ways of creation methods of an action.

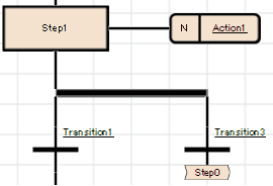
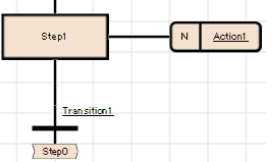
Each action has a different type. The type can be checked in the "Action Properties" screen.

"Detailed Expression" or "MELSAP-L (Instruction Format)" for the ladder display method can be switched in [View] ⇒ [Switch Ladder Display].

| Creation method | Type | Operating procedure |
|--|---------------------|--|
| Create an action with a program (ladder, ST, FBD/LD). Describe a program in a Zoom. | Detailed expression | Page 381 Creating Zooms (detailed expression) |
| Create an action with a program (instruction format of a ladder). Describe a program in the properties. | Detailed expression | Page 382 Creating Zooms (MELSAP-L (instruction format)) |
| Use ON/OFF of bit device/bit type label as an action. Describe an action on an SFC diagram. | Label/device | Select an action, then enter a bit device/bit-specified word device, or a bit type label in the action name. |

Inserting/editing jumps (connection lines)

■Inserting a jump

| Insertion position | Operating procedure |
|---|---|
|  | <ol style="list-style-type: none"> 1. Select a transition, then select [Edit] ⇒ [Insert] ⇒ [Jump] (⌘J). 2. Select a step name of jump destination. |
|  | <ol style="list-style-type: none"> 1. Select a transition, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line]. 2. Select a step name of jump destination. <p>All SFC diagram written below the inserted jump are deleted.</p> |

■Changing a jump destination

1. Select the transition which is immediately before the jump, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].
Alternatively, select the jump, and press the **F2** key.
2. Select the step name of jump destination which is to be changed.

■Switching a jump/connection line

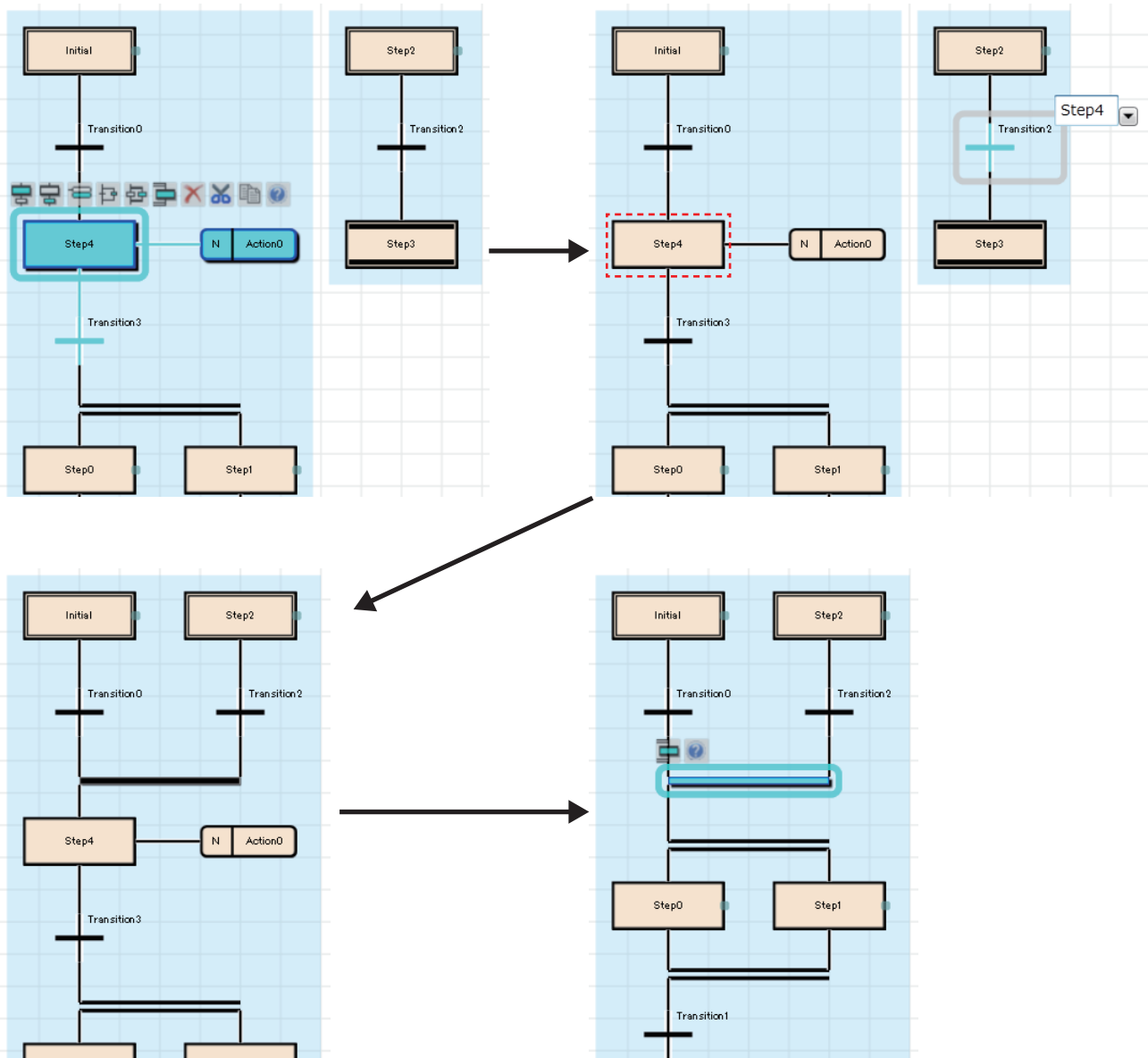
Select a jump, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].
To restore a connection line to a jump, select the connection line, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].

Precautions

When multiple initial steps are included, a jump cannot be inserted in a step of a simultaneous branch.



To connect a jump with a simultaneous branch, connect it immediately before the simultaneous branch according to the following procedure.

1. Insert a step before a simultaneous branch.
2. Select a transition, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].
3. Select the name of the inserted step.
4. Select a jump, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].
5. Delete the inserted step.




Inserting/adding selection branches and simultaneous branches

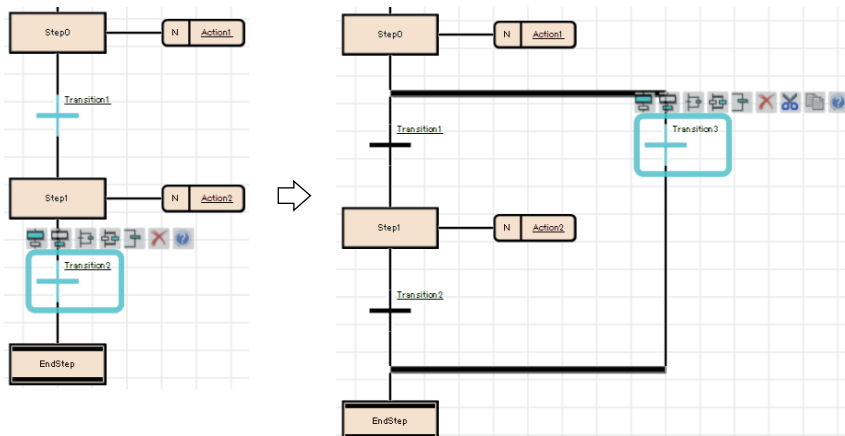
■ Inserting a branch below a step/transition

Select a step/transition, then select [Edit] ⇒ [Insert] ⇒ [Selection Branch] ()/[Simultaneous Branch] ().


When a selection branch/simultaneous branch was inserted, the lacking SFC elements are inserted automatically to make it be a proper SFC diagram.

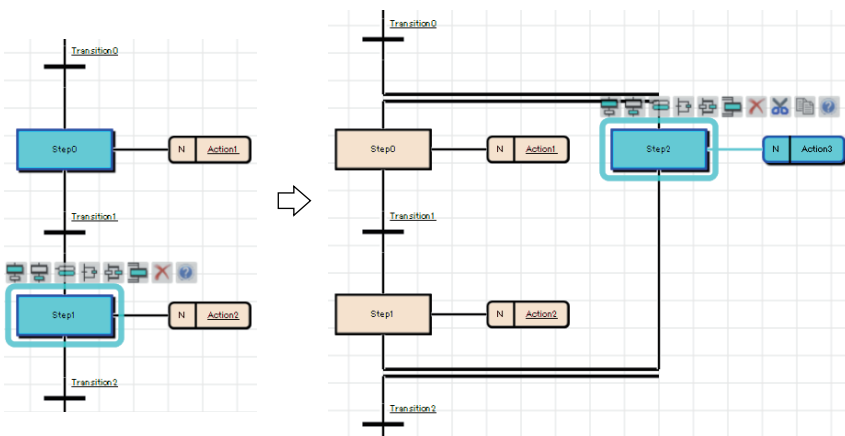
■ Adding a selection branch on the right side of a transition/selection condition

Select a transition/selection branch to which a new one will be added, then select [Edit] ⇒ [Insert] ⇒ [Selection Branch Leg] (). (Multiple selections allowed.)



■ Adding a simultaneous branch on the right side of a step/simultaneous branch

Select a step/simultaneous branch to which a new one is added, then select [Edit] ⇒ [Insert] ⇒ [Simultaneous Branch Leg] (). (Multiple selections allowed.)



Common operations of SFC elements

| Operation | | Operating procedure | |
|-----------|--------------------------------|--|---|
| | | Mouse | Keyboard |
| Select | To select a single element | Click an element to be selected. | Move the cursor on an element to be selected. |
| | To select multiple elements | <ul style="list-style-type: none"> Click multiple elements with the [Shift] key held down. Click the background of an SFC diagram editor, and drag the mouse diagonally around all elements to be selected. | Select multiple elements by moving the cursor with the [Shift] key held down. |
| | To select an SFC network block | Click an element, then select [Edit] ⇒ [Select SFC Network Block]. | Select an element, then press the [Ctrl] + [Shift] + [A] keys. |
| | To select whole elements | The operation is the same as that for selecting multiple elements. | Press the [Ctrl] + [A] keys. |
| Move | | Drag and drop an element. *1 | — |
| Copy | | Drag and drop an element to be copied with [Ctrl] held down. *1 | Press the [Ctrl] + [C] keys, then select the copy destination and press the [Ctrl] + [V] keys. (Copy + paste) |

*1 Copying a Zoom is followed as the option setting.

Deleting/cutting/copying/pasting/moving SFC elements

Some elements cannot be used by itself on an SFC editor. When SFC elements were deleted/cut/pasted, the other elements, that is not the target for this change, may be deleted/pasted to make a normal SFC diagram.

For the following elements, the previous elements of them also are deleted. For other elements, the next elements are deleted together.

- End step
- Step/transition that are placed immediately before a branch
- The last step/jump in a branch

A selected element cannot be pasted onto the other place where is not connected with a line on an SFC diagram.

For copying FBD/LD elements between editors, only pasting from an FBD/LD editor to an SFC diagram editor is available.

Point

By setting the following, a Zoom can be copied when copying a transition or an action to other blocks or projects. However, when copying them by dragging and dropping, the Zoom is not deleted even if the following has been set.

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Include Zoom in Copying"

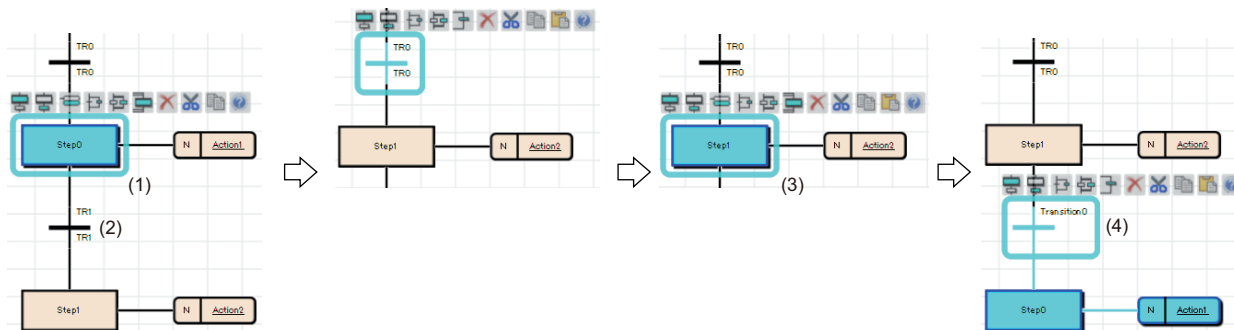
When copying a Zoom from other projects, set the following setting in a project of a copy source.

In addition, by setting the following option, the device comment of a step relay with block specification (BL□\S) or SFC transition device with block specification (BL□\TR) can also be copied when copying a step/transition.

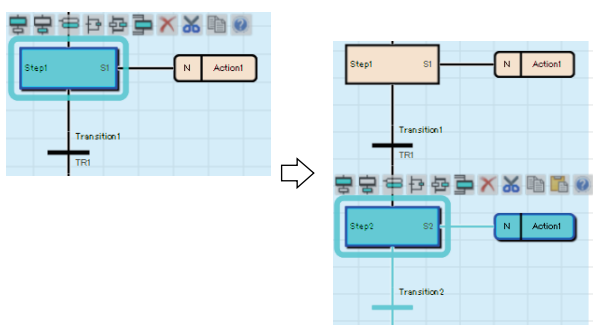
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Include Device Comment in Copying"

■Step

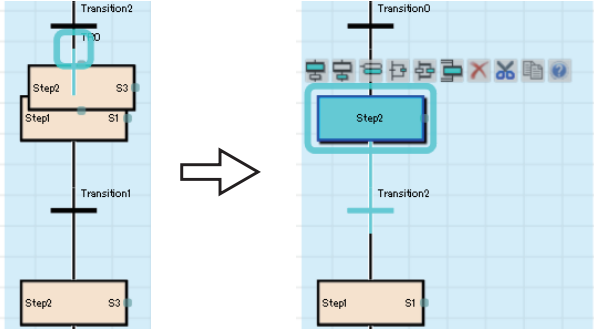
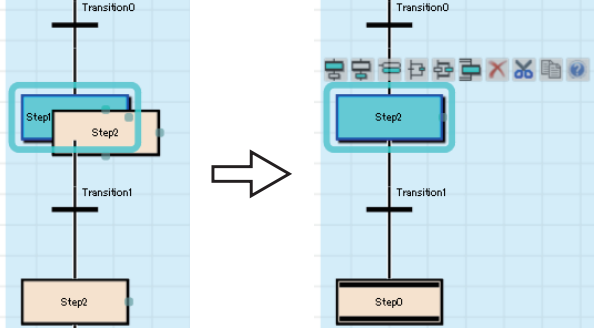
- When deleting an end step, the transition placed immediately before the end step also is deleted. Thereby, the step that connects to the above transition is changed to an end step. If the element above of the end step is a branch, the branch also is deleted.
- The following shows the operation example of cutting and pasting.
If the step (1) is cut, the next transition (2) will be deleted together. If the cut step is pasted with selecting the step (3), the lacking transition (4) of the step (3) will be inserted.



- The same step names and step numbers cannot be set in a same SFC diagram. When copying a step, the name and number of the copied step are automatically changed and pasted to the copy destination.



A step can be moved by dragging and dropping (Also, It can be copied with **Ctrl** held down). Note that the operations differ depending on the place where it is dropped.

| Operation | Example |
|---|--|
| Drag and drop a step (Step2) onto the connection line. The step (Step2) is moved there. When an action is connected with a step, the action is moved together. |  |
| Drag and drop a step (Step2) onto another step (Step1). The step (Step1) is replaced. When an action is connected to the dragged step, The step is inserted under the dropped destination. |  |

An initial step cannot be dragged and dropped. Copy it at a keyboard.

■Transition

Same Transition No. cannot be set in a same SFC diagram.

When copying a transition, the number of the copied transition is automatically changed and pasted to an SFC diagram in the same block.

When a Zoom has already been created, the Zoom is not deleted even if the transition is deleted on an SFC diagram. Delete it in the "Zoom List" screen. (Page 383 Displaying a Zoom list)

A transition can be moved by dragging and dropping (Also, It can be copied with held down). Note that the operations differ depending on the place where it is dropped.

| Operation | Example |
|--|---------|
| Drag and drop a transition (Transition1) onto the connection line. The transition (Transition1) is moved there. When a transition of the direct expression connects with an FBD/LD element such as a contact, the FBD/LD element can be moved together. | |
| Drag and drop a transition (Transition1) onto another transition (Transition0). The transition (Transition0) is replaced. When the dropped destination is the direct expression that connects with an FBD/LD element, the connected FBD/LD element is disconnected when replacing it. When the dragged transition is the direct expression that connects with an FBD/LD element, it cannot be moved. | |

Point

When copying a transition, the transition name of a copy source is copied.

When copying and pasting a transition in a same block, a same Zoom is shared between a copy source and a copy destination.

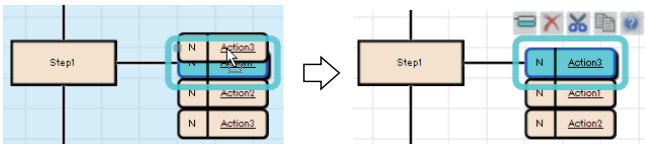
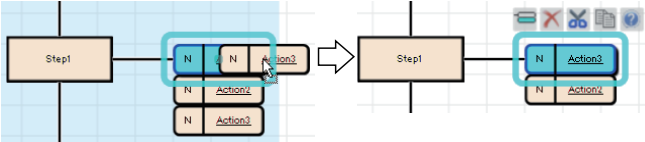
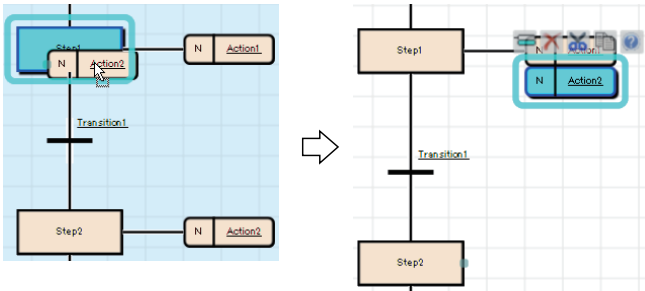
For copying a transition with a different transition name from that of a copy source, set the following option.

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Paste Data with Different Data Name"

■Action

Cut/copy an action, and paste it selecting a step/action of the destination.

An action can be moved by dragging and dropping (Also, It can be copied with **Ctrl** held down). Note that the operations differ depending on the place where it is dropped.

| Operation | Example |
|--|--|
| Drag and drop an action (Action3) onto a target action (Action1). The orders of those actions will be switched. |  |
| Drag and drop an action (Action3) onto the same height of a target action (Action1). The action (Action1) is replaced. |  |
| Drag and drop an action (Action2) onto a target step (Step1). The action (Action2) will be moved. |  |

When a Zoom has already been created, the Zoom will not be deleted if an action is deleted on an SFC diagram. Delete it in the "Zoom List" screen. (☞ Page 383 Displaying a Zoom list)

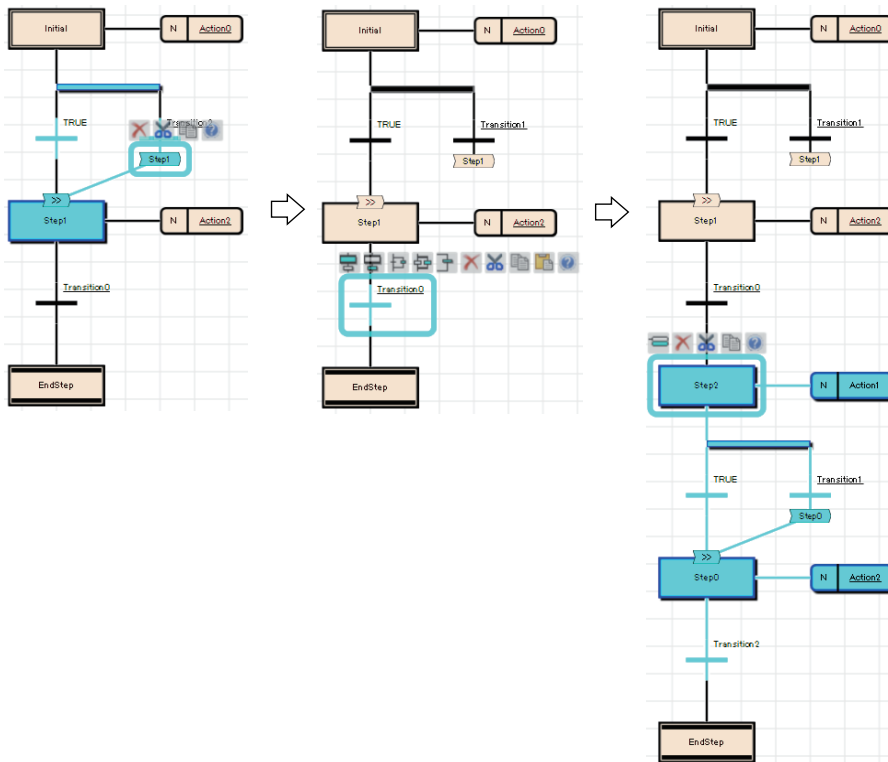
Point

- When copying an action, the action name of a copy source is copied.
- When copying and pasting an action in a same block, a same Zoom is shared between a copy source and a copy destination.
- For copying an action with a different action name from that of a copy source, set the following option.
 - [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Paste Data with Different Data Name"

■ Jump

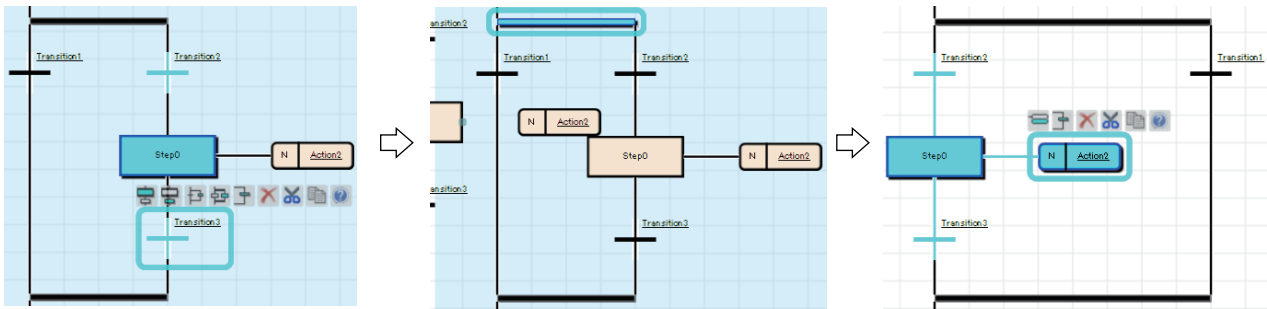
- Deleting a jump only is not applicable. Switch the jump to a connection line first. (☞ Page 379 Changing a jump to a selection branch (connection))
- It is not applicable to copy a jump only. Copy a jump source and a jump destination, and paste them.

The following is an example image when selecting and pasting a transition (Transition0). When selecting an end step, it is pasted as well.



■ Selection branch

Drag and drop a step or a transition onto the left/right side of a selection branch. The orders of those branches is switched.

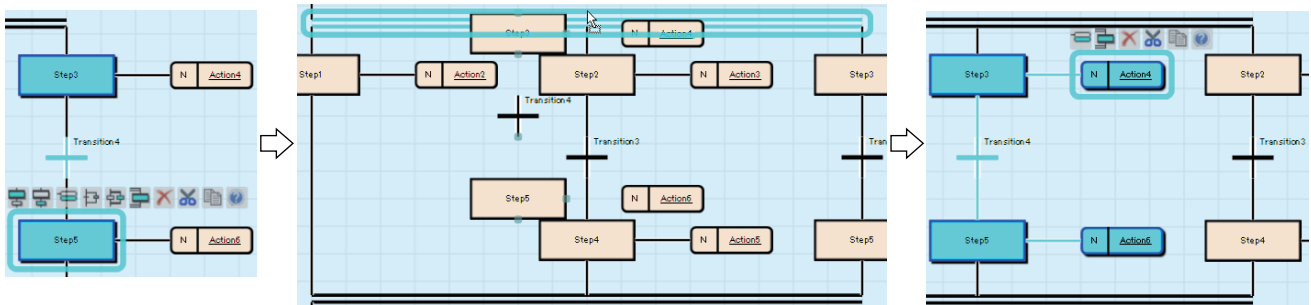


Precautions

The left side of transition is given priority to perform when both side of transitions were satisfied at a same time. Check the operation of SFC program before switching branches.

■ Simultaneous branch

Drag and drop a step and a transition onto the simultaneous branch. The orders of those branch will be switched.



■ SFC network block

Elements in an SFC network block can be deleted/copied/cut in a batch by selecting the SFC network block.

When the leftmost SFC network block includes multiple initial steps, the SFC network block cannot be copied and cut. Copy and cut for each element.

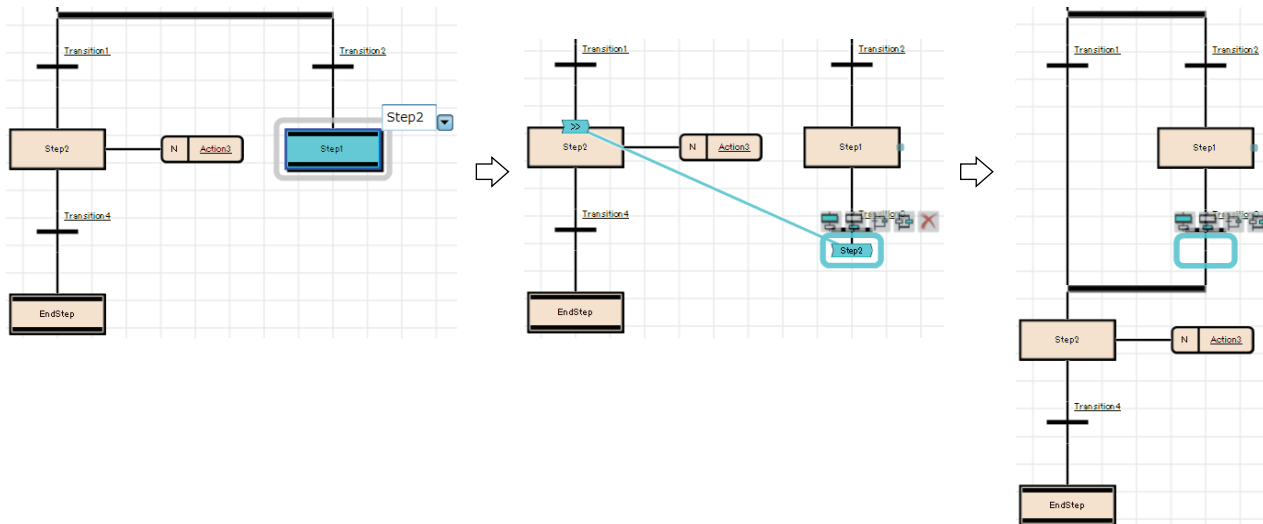
Changing an SFC element

■ Changing an end step to a normal step

For restoring a step which has been changed to an end step (example: Step1) once to a normal step, switch it to a jump, then switch the jump symbol to a connection line.

Ex.

1. Select an end step (Step1), and select [Edit] ⇒ [Modify] ⇒ [End Step/Jump]. Then select a step name (Step2) which has been placed under the branch before changing.
2. Select the added jump, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].

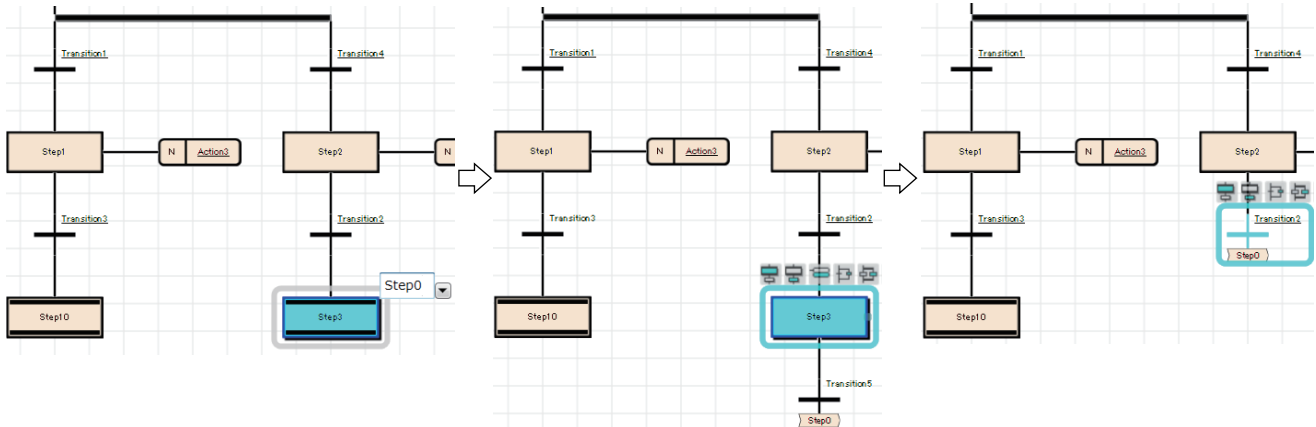


■Changing an end step to a jump

After switching an end step to a jump on the selection branch, delete the unnecessary step.

Ex.

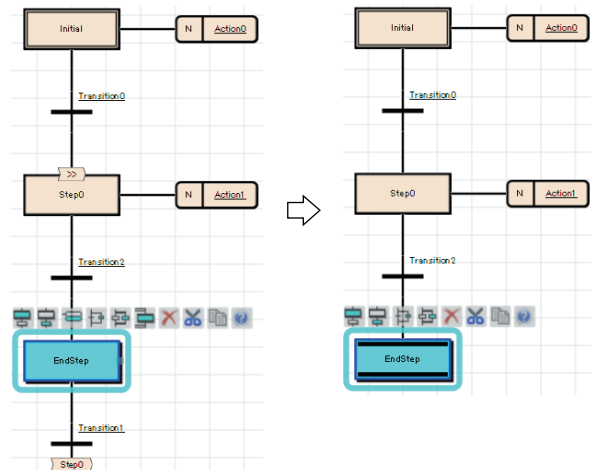
1. Select an end step to be changed (Step3), and select [Edit] ⇒ [Modify] ⇒ [End Step/Jump]. Then select a jump destination (Step0).
2. Delete the unnecessary step (Step3).



■Changing a jump to an end step

Ex.

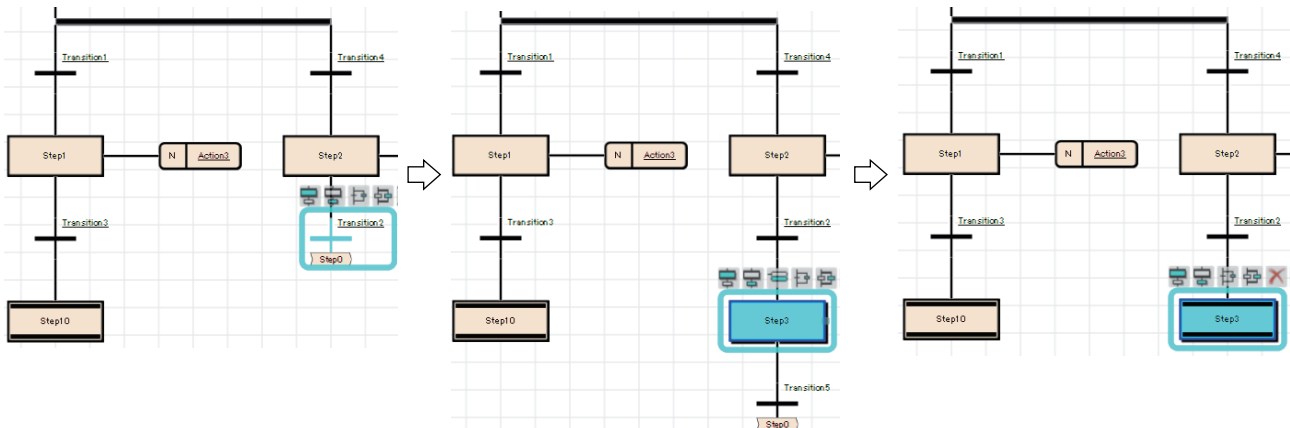
Select a step which places before a jump, then select the [Edit] ⇒ [Modify] ⇒ [End Step/Jump].



For a jump on a selection branch, insert a step before a jump to be changed, and change the step to an end step.

Ex.

1. Insert a step (Step3) before a jump to be changed.
2. Select the inserted step, then select [Edit] ⇒ [Modify] ⇒ [End Step/Jump].

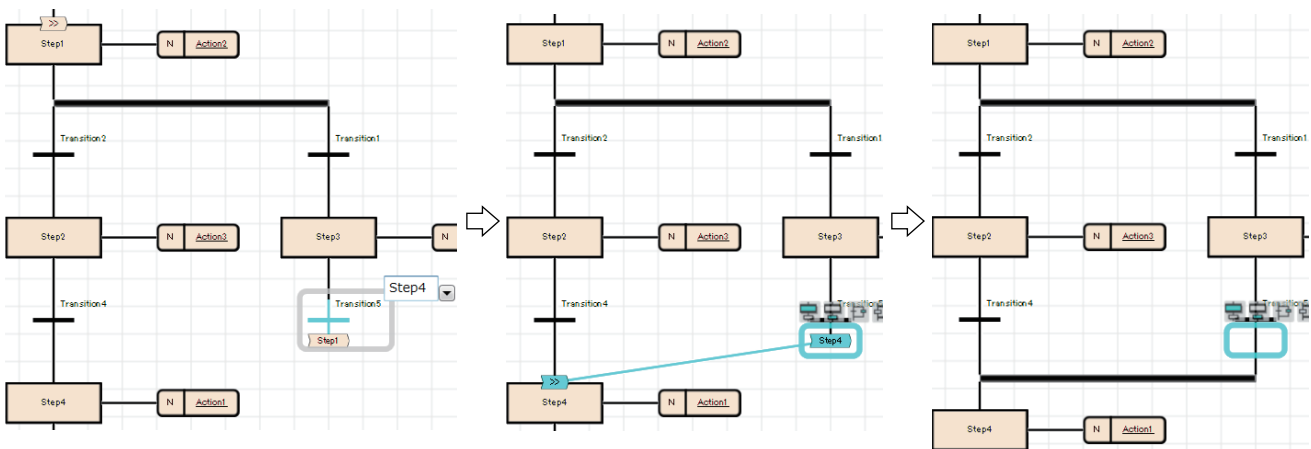


■Changing a jump to a selection branch (connection)

Change a jump destination to the step which is immediately after the branch to be connected, then switch it to a connection line.

Ex.

1. Select the transition (Transition5) that places immediately before a jump to be changed, and select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line]. Then, select the step (Step4) which will be connected with the connection line.
2. Select a jump, then select [Edit] ⇒ [Modify] ⇒ [Switch between Jump Symbol and Connection Line].



Linking a comment

A comment element is simultaneously moved with an element by linking them.
The link of a comment can be set for an SFC element and an FBD/LD element.
It cannot be set for a selection blanch, simultaneous branch, and jump symbol.
For the method for operating a link, refer to the following:

☞ Page 349 Linking a comment

■Method for moving only a comment element linking with an SFC element

By selecting an element with a link, all elements linking with it are selected.

To move a comment element linking with an SFC element without releasing the link, click the target element twice or select it with **Ctrl** held down.

In addition, a comment element can be moved by clicking and dragging it.

■Editing an element with a link

When copying a comment element and element that link each other, the link is remained after the copy.

However, the link of a comment element and an SFC element is released even though they are copied together.

When deleting a comment element or element that link each other, the link is released.

■Change of a position for a comment with an SFC element insertion/deletion

With an SFC element insertion or deletion, the position of a comment element with a link is moved.

As a result, if a comment element is not likely to be displayed within the frame of an SFC editor, it is displayed in the first line or the first row.

Converting a block

Whether there is any problem on an active SFC diagram can be checked. The program in a Zoom will not be checked.

Operating procedure

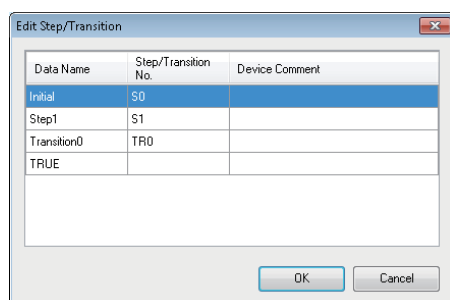
Select [Convert] ⇒ [Convert Block].

Editing Step No./Transition No.

Step No. (S□)/Transition No. (TR□) in a block and its device comments can be checked/changed in a list.

Window

Select [Edit] ⇒ [Edit Step/Transition].



| Data Name | Step/Transition No. | Device Comment |
|-------------|---------------------|----------------|
| Initial | S0 | |
| Step1 | S1 | |
| Transition0 | TR0 | |
| TRUE | | |

Operating procedure

To change a device, select the cell in the "Step/Transition No." column and click the [OK] button.

Creating/displaying Zooms (action/transition)

Creating Zooms (detailed expression)

Programs of actions/transitions can be created in languages corresponding to contents.

The entering method of a program is the same as the one for creating a program body. Some instructions cannot be used for an action/transition. For details, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

To display the SFC diagram which is to be the start source, select [View] ⇨ [Open Zoom Source Block].

Operating procedure

1. Double-click an action name/transition name on an SFC diagram.
2. Set each item in the "New Data" screen, then click the [OK] button.
3. Enter a program in a Zoom by using Ladder Diagram, Structured Text, or Function Block Diagram/Ladder Diagram language.

Precautions

When creating a Zoom in Function Block Diagram/Ladder Diagram language, inline structured text elements cannot be used.

Creating Zooms (MELSAP-L (instruction format))

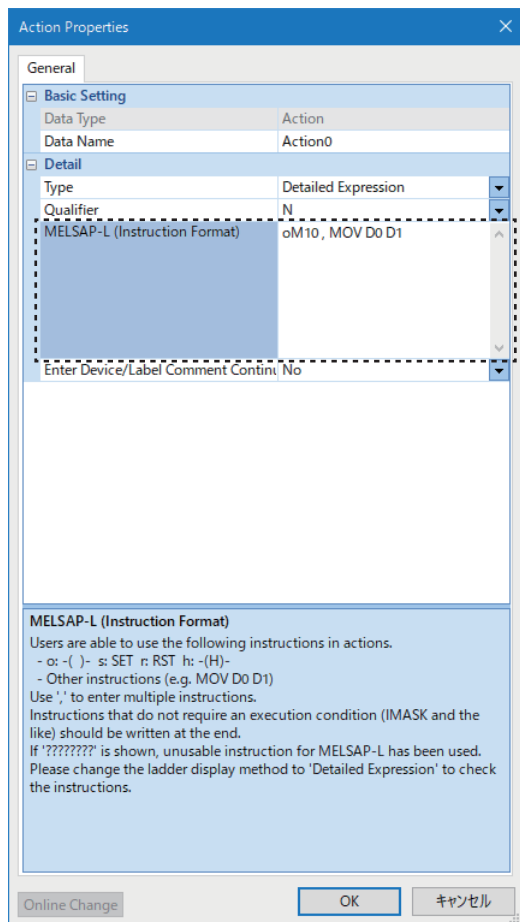
A program of an action/transition can be created in MELSAP-L (instruction format) of a ladder.

Enter a program in the property screen.

FX5CPUs do not support this Zoom creation in MELSAP-L (instruction format).

Ex.

Action properties screen



For details on MELSAP-L (instruction format), refer to the following:

MELSEC iQ-R Programming Manual (Program Design)

Operating procedure

1. Double-click an action name/transition name on an SFC diagram.
2. Enter a program in MELSAP-L (instruction format) in the "MELSAP-L (Instruction Format)" column of the displayed "Action Properties" screen or "Transition Properties" screen.
3. Click the [OK] button.

The created program is retained as one for a Zoom.

By selecting "Yes (TRUE)" or "Yes (SM400)" for the following option, then clicking the [OK] button while the "MELSAP-L (Instruction Format)" column in the "Transition Properties" screen is blank, a transition is automatically set.

- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Automatically Set Transition to TRUE/SM400"

The transition is set as follows:

- Data name: TRUE or SM400 (depends on the option value)
- Type: Label/Device

By clicking the [Online Change] button, the transition is also automatically set.

■Performing the online program change after editing a program in MELSAP-L (instruction format)

The online program change can be performed for the edited program in the property screen. The shortcut key for conversion, online program change, and all program conversion can be used in the property screen.

Only contents changed in the property screen are written. The online program change can be performed only while the property screen is opened.

The online program change cannot be performed when closing the screen by clicking the [OK] button after editing.

■Editing a device comment and label comment

By selecting "Yes" for the following item or option, the "Edit Device/Label Comment" screen appears when clicking the [OK] button in the property screen:

- "Enter Device/Label Comment Continuously" in the property screen
- [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Enter label comment and device comment continuously"

In the "Edit Device/Label Comment" screen, the comments for a device and label that are used in an action/transition in MELSAP-L (instruction format) can be edited.

In addition, multiple comments can be set for one device/label. (☞ Page 83 Display setting for multiple comments)

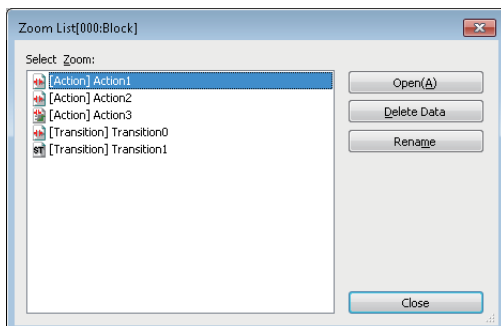
Displaying a Zoom list

Created Zooms can be displayed in a list.

Displaying/deleting/changing name of Zoom is possible in a list.

Window

- Open the target SFC diagram editor, then select [View] ⇒ [Open Zoom List].
- Select "Program" ⇒ "(execution type)" ⇒ "(program file)" ⇒ "(block)" in the navigation window, then right-click it and select [Open Zoom List] from the shortcut menu.



Displaying an SFC block list

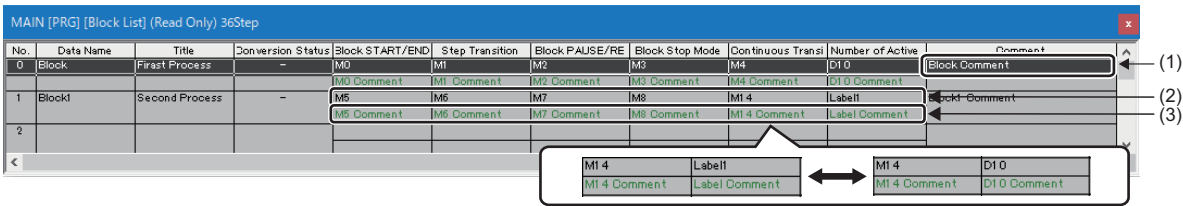
The data names, titles, conversion statuses, and block information (SFC information devices) of blocks in a program file can be displayed in a list.

For details on the SFC information device, refer to the following:

MELSEC iQ-R Programming Manual (Program Design)

Window

- Open the target SFC diagram editor, then select [View] ⇒ [Open SFC Block List].
- Select "Program" ⇒ "(execution type)" ⇒ "(program file)" in the navigation window, then right-click it and select [Open SFC Block List] from the shortcut menu.



Displayed items

| Item | Description | Related operation |
|--------------------------|---|--|
| (1) Block comment | Comments set in the "Properties" screen of block are displayed. | — |
| (2) Device/label | Devices/labels set to the block information (SFC information devices) in the "Properties" screen of block are displayed. Devices assigned to labels are also displayed. | ■Show/Hide of devices assigned to labels [View] ⇒ [Display Device] *1 |
| (3) Device/label comment | Comments for devices/labels which were set to the block information (SFC information devices) in the "Properties" screen of block are displayed. | ■Show/Hide of comments [View] ⇒ [SFC Block List Comment] |

*1 By selecting this menu, labels are switched to devices assigned to the labels. (When a device is not assigned, blank is displayed.) In addition, all devices are displayed in blue.

Displaying SFC diagrams

Display an SFC diagram of block, which is pointed with the cursor, from an SFC block list.

Operating procedure

1. Move the cursor on a block to be displayed.
2. Select [View] ⇒ [Open SFC Body], or double-click a block to be displayed.

Point

By double-clicking a blank row, a new block can be created and the SFC diagram of the block is displayed.

Copying blocks

A block can be copied on an SFC block list.

Operating procedure

1. Select a block to copy, and select [Edit] ⇒ [Copy] (📄).
2. Select a block to past the copied block, and select [Edit] ⇒ [Paste] (📄).
3. Select whether to change or overwrite its block number in the confirmation screen, and click the [OK] button.
4. Select an item to be pasted in the "Contents to Paste" screen, and click the [OK] button.

Point

Blocks copied in the navigation window can be pasted on a block list.
In that method, multiple blocks can be selected and copied in the navigation window.

Precautions

If "Step/Transition Comment" is selected in the "Contents to Paste" screen, steps/transition comments in the device comment will be pasted after pasting all copied data. Therefore, the steps/transition comments may not be pasted when the [Cancel] button is clicked during the processing even if data pasting has been already completed.

Search

■Searching for block information

Search for block information (device/label) on an SFC block list.

FX5CPUs do not support this search.

Operating procedure

1. Select [Find/Replace] ⇒ [Block Information Find Device].
2. Enter a device/label to be searched for, then click the [Find Next] button.

■Jump

Specify a block number or a data name, and move the cursor on an SFC block list.

Operating procedure

1. Select [Find/Replace] ⇒ [Jump].
2. Specify a block number or a data name in the "Jump" screen, then click the [OK] button.

Point

The "Jump" screen can be displayed by pressing a numeric key of the keyboard on an SFC block list.

Displaying local label editor

Display a local label editor of block, which is pointed with the cursor, from an SFC block list.

Operating procedure

1. Move the cursor on a block to be displayed.
2. Select [View] ⇒ [Open Label Setting].

Searching for/replacing data in a program

The search functions that can be used in an SFC diagram editor as follows:

| Function name | Description | Reference |
|------------------|---|-----------------------------|
| Cross reference | To check a declaration location and a reference location of a device and a label in a list. | Page 460 SEARCHING FOR DATA |
| Device list | To check the usage of devices being used. | |
| Find and replace | <ul style="list-style-type: none">• To search for and replace a device name, label name, instruction name, and character string.• To change contacts between open contact and close contact• To replace devices in a batch. | |

Precautions


- When a Zoom has been created, the data name of Zoom will not be changed if the character strings of transition name/action name are replaced on an SFC diagram. Change them in the "Zoom List" screen. (☞ Page 383 Displaying a Zoom list)

Displaying Help

The elements used in an SFC program can be checked in e-Manual Viewer.

To check the elements, the file of the corresponding manual must be registered in e-Manual Viewer.

Operating procedure

1. Select a check target element.
2. Press the  key.

6.7 Setting Initial Values of FB Properties

Display/setting an FB property

Display and set initial values of FB properties in the "FB Property" window.

For tag FBs, the initial label values in the structure members of tag data can be displayed and set.

Initial values in the "FB Property" window synchronize with ones in the label editor for each label.

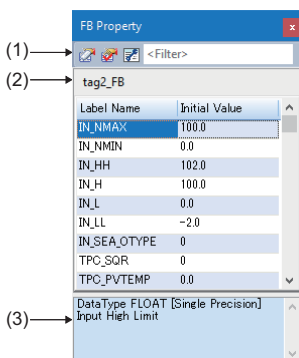
Initial values changed in the "FB Property" window are applied only for the project data. To change the initial values in an actual CPU module, use the watch function.

Configuration of the FB property window



The following shows the screen configuration of the "FB Property" window.

Window

Select [View] ⇒ [Docking Window] ⇒ [FB Property] ().



Displayed items

| Item | | Description |
|------------------------|------------------|--|
| (1) Toolbar | Initialize | Click this to initialize all initial values of FB properties with the manufacturer-defined ones. |
| | Check | Click this to check the initial values set in the FB property list. If an error is found in the check result, the background color of the item will be highlighted in red. |
| | FB Property Page | Click this to display the "FB Property Page" screen. ( Page 389 Displaying the FB property page) |
| | Filter | Label names can be filtered. |
| (2) FB instance name | | The FB instance name of a target FB or tag FB are displayed. |
| (3) Explanation column | | The data type of a label selected in the FB property list and a label comment are displayed. A label comment can be displayed in the explanation column by setting the comment title of the comment as the display target in the "Multiple Comments Display Setting" screen*1. ( Page 83 Displaying and Reading Comments) |

*1 The "Multiple Comments Display Setting" screen will appear by selecting the following menu.
[View] ⇒ [Multiple Comments] ⇒ [Display Setting]

Displaying an FB property

The FB property of the element (FB or tag FB) selected in the following editors is displayed.

| Editor | Element |
|---|------------------------------|
| Ladder editor ^{*1} | FB instance |
| Inline structured text box on a ladder editor ^{*1} | Token of an FB instance name |
| ST editor ^{*1} | Token of an FB instance name |
| FBD/LD editor ^{*1} | FB element |
| Tag FB setting editor | Tag FB |

^{*1} Only when elements in the editor in a program block are selected, the FB properties can be displayed.

When an initial value is blank on a label editor, the manufacturer-defined initial value is displayed in the "FB Property" window.

When the manufacturer-defined initial value is blank, the default initial value of each data type is displayed.

In the explanation column, the data type and comment of a selected FB property are displayed.

■Data type displayed in the "FB Property" window

The following table shows whether labels of each data type are displayed in the "FB Property" window.

○: Displayed, ×: Not displayed

| Data type | Display | Default initial value |
|--|---------|-----------------------|
| Bit | ○ | FALSE |
| Word [Unsigned]/Bit String [16-bit] | ○ | 0 |
| Double Word [Unsigned]/Bit String [32-bit] | ○ | 0 |
| Word [Signed] | ○ | 0 |
| Double Word [Signed] | ○ | 0 |
| FLOAT [Single Precision] | ○ | 0.0 |
| FLOAT [Double Precision] | ○ | 0.0 |
| Time | ○ | T#0d0h0m0s0ms |
| String | ○ | " |
| String [Unicode] | ○ | " |
| Pointer | × | — |
| Timer | × | — |
| Counter | × | — |
| Long counter | × | — |
| Retentive Timer | × | — |
| Long Retentive Timer | × | — |
| Long timer | × | — |
| Structure | × | — |
| FB | × | — |
| Array | × | — |

Changing initial values

Values displayed in the "Initial Value" column can be changed.

When initial values differ from the manufacturer-defined ones^{*1}, they will be displayed in bold in the "FB Property" window.

When initial values input in the "FB Property" window are the same as manufacturer-defined ones, the cell in "Initial Value" column corresponding to the labels will be blank in a label editor.

^{*1} Initial values displayed in the "FB Property" window and the manufacturer-defined ones are compared as character strings. (Example: 1.0 and 1.00 are considered as different values. FALSE and 0 are also considered as different values.)

Displaying the FB property page

The FB property page is a screen which categorizes FB properties by each setting. The initial values of FB properties can be checked and changed. In addition, settings for a function generator can be checked with a graph.

For details on FB properties, refer to the following:

☞ Page 387 Display/setting an FB property

The following function blocks are supported in the FB property page:

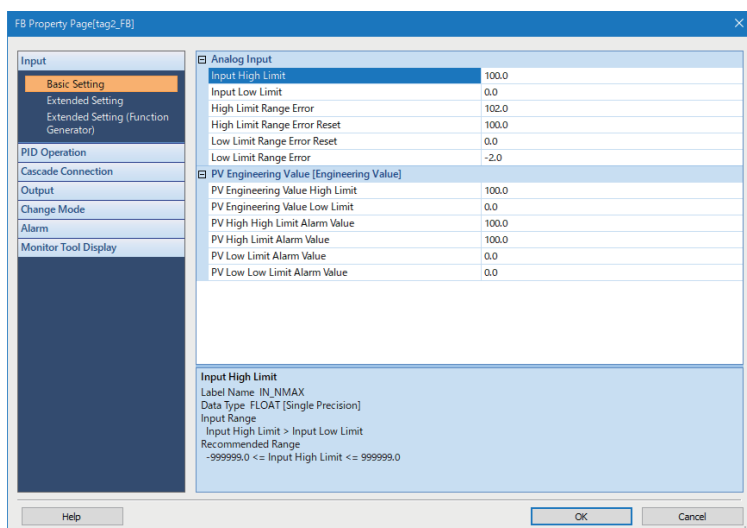
| Category | Function block |
|---------------------|----------------|
| Tag FB | Loop tag |
| | Status tag |
| | Alarm tag |
| | Message tag |
| Standard process FB | M+P_FG |
| | M+P_IFG |
| User-defined tag FB | — |

Tag FB and standard process FB

The following explains the "FB Property Page" screen of tag FBs and standard process FBs.

Window

1. Select a function block or tag FB in an FBD/LD editor or tag FB setting editor.
2. Depending on the editor, perform either of the following operations:
 - FBD/LD editor: Right-click it and select [FB Property] ⇒ [FB Property Page] from the shortcut menu.
 - Tag FB setting editor: Right-click it and select [FB Property Page] ⇒ [FB Property Page] from the shortcut menu.





Operating procedure

Change the initial value of each item, and click the [OK] button.

Precautions

If an initial value is changed, a label editor in which the corresponding label is defined will be in the unconverted state.

- The "FB Property Page" screen can also be displayed by clicking the  button in the "FB Property" window.
- The manual describing a selected FB property can be opened from the "FB Property Page" screen. Place the cursor on the cell for an FB property, then click the [Help] button or press the  key. If there is no description of the FB property, the page for the selected function block will be displayed.

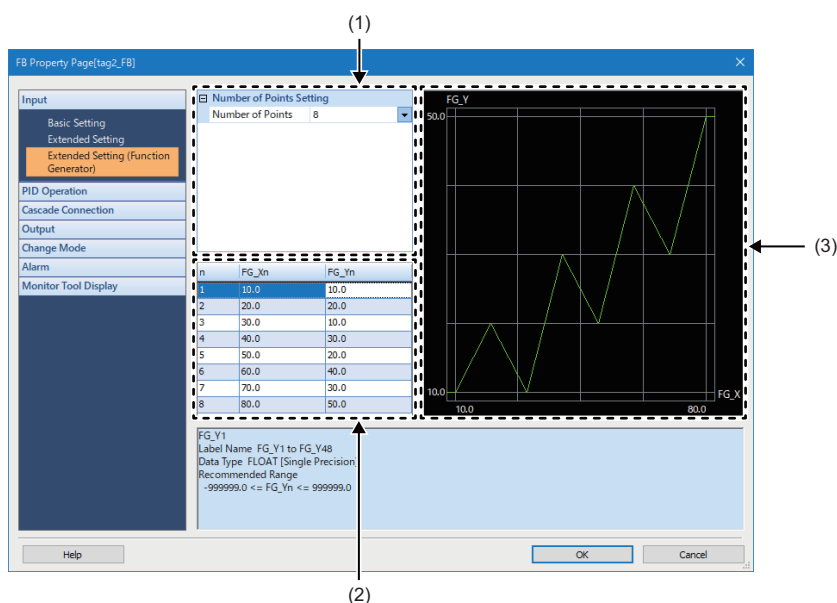
■Checking a line graph

Settings for a function generator of FB properties can be checked with a graph.

The following uses the tag FB type "M+M_2PIDH_" as an example.

Window

1. Open the FB property page.
2. Select "Input" ⇒ "Extended Settings (Function Generator)."



Displayed items

| Item | Description |
|------------------------------------|--|
| (1) FB property list | Set the number of coordinates for a line graph to be drawn. |
| (2) FB property list (coordinates) | Set the coordinates of a line graph. FB properties that link to the graph coordinates are displayed for the number set in "Number of Points." |
| (3) Graph display area | A graph is displayed based on the coordinate settings. |

Operating procedure

1. Set "Number of Points" in the FB property list.
2. Set the coordinates of a line graph in the FB property list (coordinates).
3. Click the [OK] button.

User-defined tag FB

The following explains the "FB Property Page" screen of user-defined tag FBs.

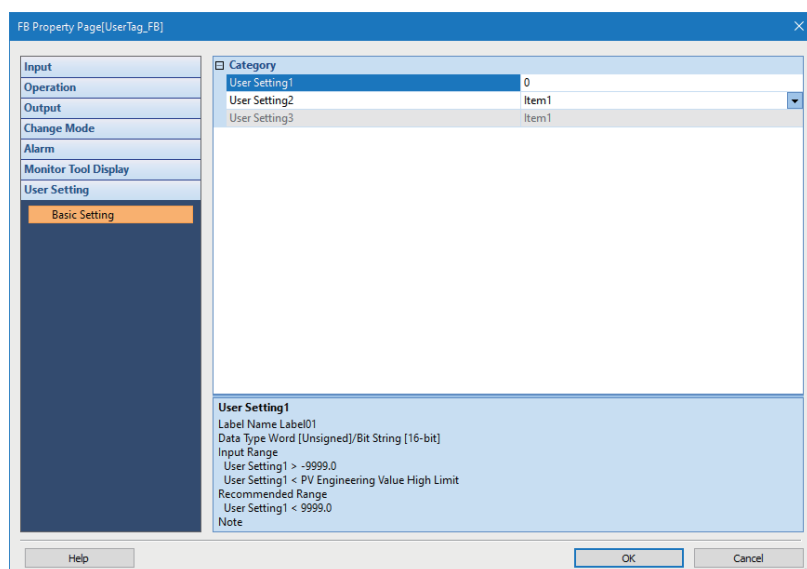
The "FB Property Page" screen of user-defined tag FBs is displayed based on the contents of a setting file.



Therefore, a template file needs to be edited in advance to create a setting file.

Window

1. Set the path to a folder that saves a setting file in the following option:
 - [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Process Control Extension Setting" ⇒ "FB Property Page" ⇒ "Setting File Save Destination"
2. Select a user-defined tag FB in the navigation window. (Multiple selections allowed.)
3. Right-click it and select [FB Property Page Setting] ⇒ [Create Template File] from the shortcut menu.
4. Read a displayed message, and click the [OK] button.
5. Edit a template file and create a setting file. (➡ Page 392 Creating a setting file)
6. Select a user-defined tag FB on an FBD/LD editor or tag FB setting editor.
7. Depending on the editor, perform either of the following operations:
 - FBD/LD editor: Right-click it and select [FB Property] ⇒ [FB Property Page] from the shortcut menu.
 - Tag FB setting editor: Right-click it and select [FB Property Page] ⇒ [FB Property Page] from the shortcut menu.

The "FB Property Page" screen is displayed based on the contents of the created setting file.



- If a setting file with the same name exists in the save destination, the file is overwritten.
- The "FB Property Page" screen can also be displayed by clicking the  button in the "FB Property" window. If a setting file does not exist in the save destination, a template file is also created.
- If a setting file already exists, a template file does not need to be created.
- The manual describing a selected FB property or manual set in the setting file can be opened from the "FB Property Page" screen. Place the cursor on the cell for an FB property, then click the [Help] button or press the  key.

Operating procedure

Change the initial value of each item, and click the [OK] button.

Precautions

- If an initial value is changed, a label editor in which the corresponding label is defined will be in the unconverted state.
- An FB property of the following data types is not displayed in the "FB Property Page" screen.
 - Time
 - String
 - String [Unicode]
- A user-defined category and FB property cannot be displayed on a line graph.

Creating a setting file

The "FB Property Page" screen of user-defined tag FBs is displayed based on the contents of a setting file.

The following explains the formats and correction methods of a setting file.

File format

| Item | Description |
|----------------|--|
| Extension | .csv |
| File name | "(User-defined tag FB name)".csv |
| Character code | Unicode (UTF-16 Little Endian with BOM). |
| Line feed code | CRLF |
| Delimiter | Tab |

Precautions

Surrogate pair characters cannot be used.

Component

The following explains the components of a setting file.

Ex.

Template file

```
[Window Configuration]<CRLF>
#Hierarchy 1 <TAB> Hierarchy 2 <TAB> Label Name <TAB> Display Character Strings <TAB> Parent Category <TAB> Note <TAB> Input Format<CRLF>
#Input <TAB> Basic Setting <TAB> <TAB> PV Engineering Value [Engineering Value] <TAB> <CRLF>
#Input <TAB> Basic Setting <TAB> RH <TAB> PV Engineering Value High Limit <TAB> PV Engineering Value [Engineering Value]<CRLF>
#Input <TAB> Basic Setting <TAB> RL <TAB> PV Engineering Value Low Limit <TAB> PV Engineering Value [Engineering Value]<CRLF>
#Input <TAB> Basic Setting <TAB> HH <TAB> PV High High Limit Alarm Value <TAB> PV Engineering Value [Engineering Value]<CRLF>
#Input <TAB> Basic Setting <TAB> PH_ <TAB> PV High Limit Alarm Value <TAB> PV Engineering Value [Engineering Value]<CRLF>
#Input <TAB> Basic Setting <TAB> PL <TAB> PV Low Limit Alarm Value <TAB> PV Engineering Value [Engineering Value]<CRLF>
#Input <TAB> Basic Setting <TAB> LL <TAB> PV Low Low Limit Alarm Value <TAB> PV Engineering Value [Engineering Value]<CRLF>
#Input <TAB> Extended Setting <TAB> <TAB> PV Engineering Value <TAB> <CRLF>
#Input <TAB> Extended Setting <TAB> ALPHA <TAB> PV Filter Coefficient <TAB> PV Engineering Value<CRLF>
#Input <TAB> Extended Setting <TAB> HS <TAB> PV High/Low Limit Alarm Hysteresis [%] <TAB> PV Engineering Value<CRLF>
#Input <TAB> Extended Setting <TAB> <TAB> Variation Rate Check <TAB> PV Engineering Value<CRLF>
#Input <TAB> Extended Setting <TAB> DPL <TAB> Variation Rate Alarm Value [%] <TAB> Variation Rate Check<CRLF>
#Input <TAB> Extended Setting <TAB> CTIM <TAB> Variation Rate Alarm Check Time [s] <TAB> Variation Rate Check<CRLF>

#Alarm <TAB> Basic Setting <TAB> MLL <TAB> Output Low Limit Alarm Level <TAB> Alarm Level Setting<CRLF>
#Alarm <TAB> Basic Setting <TAB> DMLL <TAB> Output Variation Rate Limit Alarm Level <TAB> Alarm Level Setting<CRLF>
#Alarm <TAB> Basic Setting <TAB> OOL <TAB> Output Open Alarm Level <TAB> Alarm Level Setting<CRLF>
#Monitor Tool Display <TAB> Basic Setting <TAB> <TAB> Unit Setting <TAB> <CRLF>
#Monitor Tool Display <TAB> Basic Setting <TAB> UNIT <TAB> Index No. <TAB> Unit Setting<CRLF>
#Monitor Tool Display <TAB> Basic Setting <TAB> <TAB> Number of digits after the decimal point Setting <TAB> <CRLF>
#Monitor Tool Display <TAB> Basic Setting <TAB> N_ <TAB> Number of digits after the decimal point <TAB> Number of digits after the decimal point Setting<CRLF>
"Public Variable" <TAB> "Public Variable1" <TAB> "" <TAB> "Category" <TAB> "" <TAB> "" <TAB> "0"<CRLF>
"Public Variable" <TAB> "Public Variable1" <TAB> "Label01" <TAB> "Label01" <TAB> "Category" <TAB> "" <TAB> "0"<CRLF>
"Public Variable" <TAB> "Public Variable1" <TAB> "Label02" <TAB> "Label02" <TAB> "Category" <TAB> "" <TAB> "0"<CRLF>
"Public Variable" <TAB> "Public Variable1" <TAB> "Label03" <TAB> "Label03" <TAB> "Category" <TAB> "" <TAB> "0"<CRLF>
"Public Variable" <TAB> "Public Variable1" <TAB> "Label04" <TAB> "Label04" <TAB> "Category" <TAB> "" <TAB> "0"<CRLF>
"Public Variable" <TAB> "Public Variable1" <TAB> "Label05" <TAB> "Label05" <TAB> "Category" <TAB> "" <TAB> "0"<CRLF>
[Check Error]<CRLF>
#Error Type <TAB> Label Name <TAB> Conditions <TAB> Comparison Target<CRLF>
[Editable/Non-editable]<CRLF>
#Label Name <TAB> Setting Value <TAB> Label Name to Switch <TAB> Editable/Non-editable<CRLF>
[Combo Box]<CRLF>
#Label Name <TAB> Item Name<CRLF>
[Help Reference]<CRLF>
#Label Name <TAB> Help Reference<CRLF>
[Hidden Item]<CRLF>
#Label Name<CRLF>
```

| No. | Component | Description |
|-----|-----------|---|
| ❶ | Section | This consists of one section name and '0' or more rows. The first section must be the [Window Configuration] section. The order of subsequent sections can be changed. Same section cannot be set two or more times. Characters after ']' at the end of a section name are skipped. |
| ❷ | Row | This consists of one or more columns, a delimiter, and line feed indicating the end. The required number of columns differs depending on the section. Columns after the required number of columns are skipped. |
| ❸ | Column | This consists of '0' or more characters enclosed with " (double quotes) from the beginning to the end. |
| ❹ | Comment | When the beginning of a row is '#', the row is treated as a comment. The contents of a comment is skipped. |

Section list

| Section name | Description | Required/ optional | Reference |
|-------------------------|--|--------------------|--|
| [Window Configuration] | Configuration information of the "FB Property Page" screen | Required | Page 396 [Window Configuration] section |
| [Check Error] | Definition of the check contents | Optional | Page 399 [Error Check] section |
| [Editable/Non-editable] | Definition of the editable/non-editable | | Page 401 [Editable/Non-editable] section |
| [Combo Box] | Definition of the display items in a combo box | | Page 403 [Combo Box] section |
| [Help Reference] | Setting of a help reference | | Page 404 [Help Reference] section |
| [Hidden Item] | Definition of the items not to be displayed | | Page 406 [Hidden Item] section |

Template file

The following shows a template file and FB property page displayed based on the contents of the template file.

Ex.

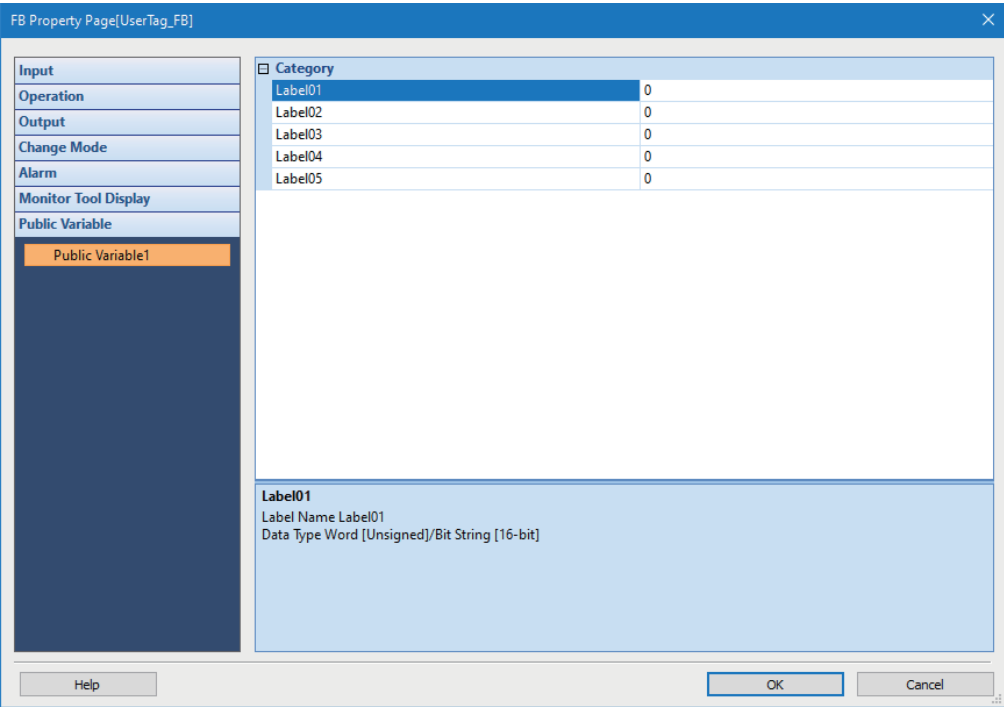
When creating a template file from the following user-defined tag FB:

- Tag type: PID
 - User-defined FB property: Label01, Label02, Label03, Label04, Label05
- Template file

```
[Window Configuration]
#Hierarchy 1 Hierarchy 2 Label Name Display Character Strings Parent Category Note Input Format
#Input Basic Setting PV Engineering Value [Engineering Value]
#Input Basic Setting RH PV Engineering Value High Limit PV Engineering Value [Engineering Value]
#Input Basic Setting RL PV Engineering Value Low Limit PV Engineering Value [Engineering Value]
#Input Basic Setting HH PV High High Limit Alarm Value PV Engineering Value [Engineering Value]

#Monitor Tool Display Basic Setting Unit Setting
#Monitor Tool Display Basic Setting UNIT Index No. Unit Setting
#Monitor Tool Display Basic Setting Number of digits after the decimal point Setting
#Monitor Tool Display Basic Setting N_ Number of digits after the decimal point Number of digits after the decimal point Setting
"Public Variable" "Public Variable1" "" "Category" "" "" "0"
"Public Variable" "Public Variable1" "Label01" "Label01" "Category" "" "" "0"
"Public Variable" "Public Variable1" "Label02" "Label02" "Category" "" "" "0"
"Public Variable" "Public Variable1" "Label03" "Label03" "Category" "" "" "0"
"Public Variable" "Public Variable1" "Label04" "Label04" "Category" "" "" "0"
"Public Variable" "Public Variable1" "Label05" "Label05" "Category" "" "" "0"
[Check Error]
#Error Type Label Name Conditions Comparison Target
[Editable/Non-editable]
#Label Name Setting Value Label Name to Switch Editable/Non-editable
[Combo Box]
#Label Name Item Name
[Help Reference]
#Label Name Help Reference
[Hidden Item]
#Label Name
```

FB property page



■Output content

A section name is output in the first row of each section.

A column name is output as a comment in the second row of each section.

For the [Window Configuration] section, the following contents are also output:

- Window configuration of the tag data
- Default setting of a user-defined FB property

Ex.

When creating a template file from the following user-defined tag FB:

- Tag type: PID
- User-defined FB property: Label01, Label02, Label03, Label04, Label05

| | | | | | | | |
|---|------------------------|----------------------|----------------------|---------------------------|----------------------|---------------------|--------------|
| ① | [Window Configuration] | | | | | | |
| | #Hierarchy 1 | Hierarchy 2 | Label Name | Display Character Strings | Parent Category | Note | Input Format |
| | #Input Basic Setting | PV Engineering Value | [Engineering Value] | | | | |
| ② | #Input Basic Setting | RH | PV Engineering Value | High Limit | PV Engineering Value | [Engineering Value] | |
| | "Public Variable" | "Public Variable1" | "Category" | "0" | | | |
| | "Public Variable" | "Public Variable1" | "Label01" | "Label01" | "Category" | "0" | |
| | "Public Variable" | "Public Variable1" | "Label02" | "Label02" | "Category" | "0" | |
| | "Public Variable" | "Public Variable1" | "Label03" | "Label03" | "Category" | "0" | |
| | "Public Variable" | "Public Variable1" | "Label04" | "Label04" | "Category" | "0" | |
| | "Public Variable" | "Public Variable1" | "Label05" | "Label05" | "Category" | "0" | |

① Window configuration of the tag data: The contents of the 'Hierarchy 1' column, 'Hierarchy 2' column, 'Label Name' column, 'Display Character Strings' column, and 'Parent Category' column are output as a comment.

② Default setting of a user-defined FB property: The following contents are output:

| Column name | Description | Remarks |
|---------------------------|-------------------------|--|
| Hierarchy 1 | "Public Variable" | When the number of items in a hierarchy reaches the upper limit, the end number of the public variable is added by one, as "Public Variable2, 3...". If a hierarchy with the same name already exists, the end number is also added by one. |
| Hierarchy 2 | "Public Variable1" | |
| Label Name | Label name | |
| Display Character Strings | "Category, " label name | |
| Parent Category | Category name | |
| Note | Label comment | |
| Input Format | "0" | |

Precautions

- Among the window configurations of the tag data, the one of an FB property list (coordinates) in the window which displays a line graph is not output.
- An FB property of the following data types is not output:
 - Time
 - String
 - String [Unicode]

[Window Configuration] section

This section describes the window configuration information of the FB property page (such as character strings to be displayed and FB properties to be associated).

One category or the window configuration information of one FB property is described per row.

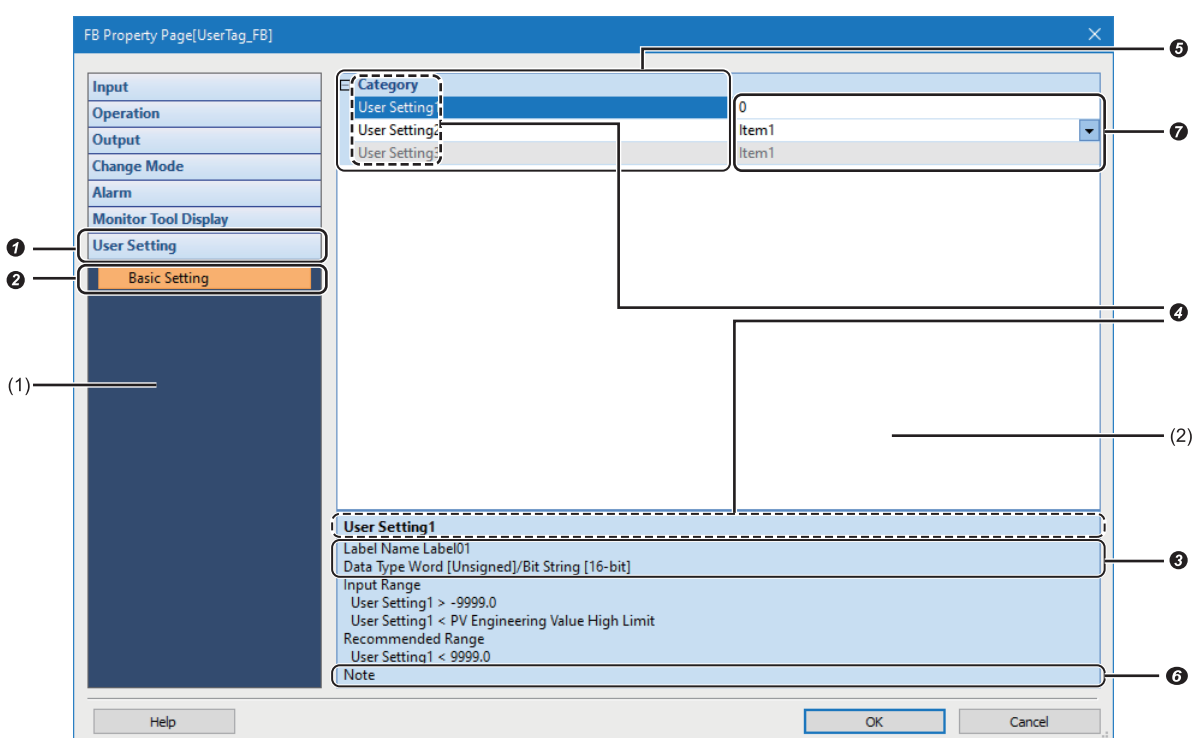
■Example

Setting file

```
[Window Configuration]
#Hierarchy 1 <TAB> Hierarchy 2 <TAB> Label Name <TAB> Display Character Strings <TAB> Parent Category <TAB> Note <TAB> Input Format
"User Setting" <TAB> "Basic Setting" <TAB> "" <TAB> "Category" <TAB> "" <TAB> "" <TAB> ""
"User Setting" <TAB> "Basic Setting" <TAB> "Label01" <TAB> "User Setting1" <TAB> "Category" <TAB> "Note" <TAB> "0"
"User Setting" <TAB> "Basic Setting" <TAB> "Label02" <TAB> "User Setting2" <TAB> "Category" <TAB> "Note" <TAB> "1"
"User Setting" <TAB> "Basic Setting" <TAB> "Label03" <TAB> "User Setting3" <TAB> "Category" <TAB> "Note" <TAB> "1"
```



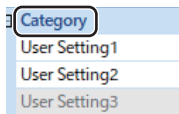
FB property page



(1): Setting item tab

(2): FB property list

| No. | Column name | Description | Restriction |
|-----|---------------------------|--|---|
| ❶ | Hierarchy 1 ^{*1} | Set a character string to be displayed in the first hierarchy of the setting item tab. A hierarchy of the tag data and user-defined hierarchy can be set. | <ul style="list-style-type: none"> Maximum number of characters: 128 Maximum number of hierarchy 1: 100 |
| ❷ | Hierarchy 2 ^{*1} | Set a character string to be displayed in the second hierarchy of the setting item tab. A hierarchy of the tag data and user-defined hierarchy can be set. | <ul style="list-style-type: none"> Maximum number of characters: 128 Maximum number of hierarchy 2 (within one hierarchy 1): 10 Maximum number of items within hierarchy 2 (categories + FB properties): 200 |
| ❸ | Label Name | Set a label name of a user-defined FB property to be associated. The set name and data type of the label are displayed in the 'Note' column of the FB property. An FB property of the tag data cannot be set. For a category, set a null character. | — |
| ❹ | Display Character Strings | Set a character string to be displayed in an item in the FB property list (category name and setting item name). Null characters cannot be set. The set content is displayed in the 'Note' column of the FB property. | Maximum number of characters: 256 |

| No. | Column name | Description | Restriction |
|-----|-------------------------------|---|------------------------------------|
| 5 | Parent Category ^{*2} | <p>Set a category name defined in a setting file. (Only categories defined in the same hierarchy 2 can be set.)</p> <p>(Example) When setting "Category" for a parent category of user setting 1, 'User Setting1' is displayed in a child hierarchy of "Category."</p>  <p>A parent category of the tag data and a user-defined parent category can be set. When no parent category exists, set a null character. (A null character can be set for only categories.)</p> | Maximum number of hierarchies: 5 |
| 6 | Note ^{*3} | <p>Set a character string to be displayed in the 'Note' column of an FB property.</p> <p>For a category, this is skipped.</p> | Maximum number of characters: 1024 |
| 7 | Input Format ^{*4} | <p>Set an input format as either of the following values:</p> <ul style="list-style-type: none"> • 0: Directly input • 1: Combo box <p>For a category, this is skipped.</p> | — |

*1 When setting a hierarchy in which a line graph is displayed, a file format error occurs.

*2 If a category (category of the tag data) with the same name exists within the hierarchy 2, a category displayed higher in the FB property page is set as a parent category.

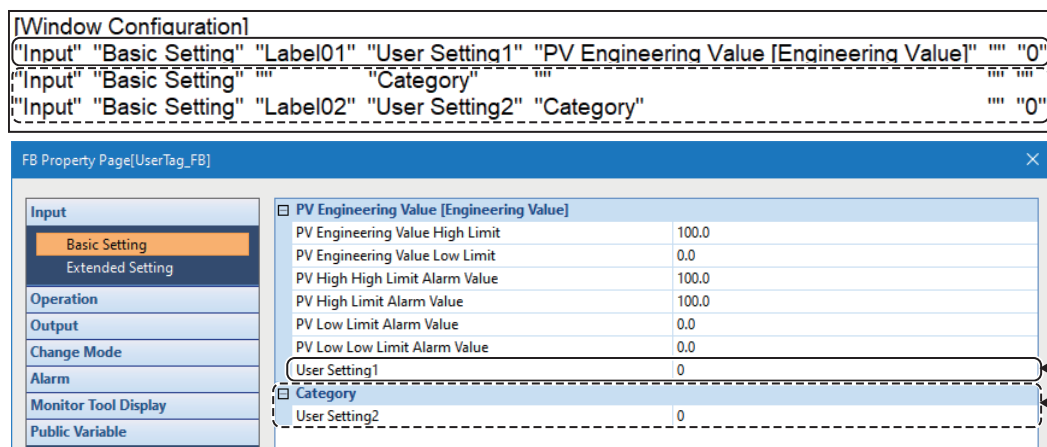
*3 An escape character (\) can be used in the 'Note' column. If it is used in other columns, it is not treated as an escape character. It is applied only for the following cases. In other cases, a file format error occurs.

| Case | Description |
|------|------------------------------------|
| \r | It is treated as a line feed (CR). |
| \n | It is treated as a line feed (LF). |
| \" | " is treated as a character. |
| \\ | \ is treated as a character. |

*4 When '0' (directly input) is set for an input format of a BOOL type FB property, a combo box to select "No" or "Yes" is displayed.

Point

- Even if the window configuration of an FB property not to be displayed in the "FB Property" window is set, it will be displayed in the FB property page.
If an FB property to be displayed in the "FB Property" window is not set in both the [Window Configuration] section and [Hidden Item] section, the default setting is displayed in the FB property page.
- The FB property page is displayed according to the order in which rows are listed.
- A user-defined hierarchy, category, and FB property are displayed under a hierarchy of the tag data, parent category, and FB property.
- The setting of a user-defined FB property can be added to the setting of the tag data.
(Example) When adding the settings of Label01 and Label02 in "Input" ⇒ "Basic Setting"



Precautions

- Multiple rows cannot be set for one FB property.
- A category with the same name cannot be set in the hierarchy 2. (It can be set in a different hierarchy.)
- A row is read in order from the top in a file; therefore, a category defined in a row below an FB property cannot be set as a parent category.
- When setting a window configuration of an FB property of the following data types, "FB property does not exist" is displayed in the FB property page.
 - Time
 - String
 - Sting [Unicode]

■Error condition

The following shows the conditions that cause a format error of the [Window Configuration] section when reading a setting file.

- Unsupported escape sequence is used in the 'Note' column.
- A null character is set in the 'Display Character Strings' column.
- The maximum number of characters is exceeded.
- Either of the following exceeds the maximum number:
 - Hierarchy 1
 - Hierarchy 2 (within one hierarchy 1)
- The maximum number of items in the hierarchy 2 (categories + FB properties) is exceeded.
- A hierarchy in which a line graph is displayed is set.
- Multiple window configurations are set for one FB property.
- A category with the same name is defined in the hierarchy 2.
- A parent category is not set in an FB property.
- The name of a non-existent category is set as a parent category.
- The maximum number of hierarchies is exceeded.
- Unsettable value is set in the 'Input Format' column.

[Error Check] section

This section sets the error check contents for FB properties.
One error check content can be set per row.

Example

Setting file

| [Check Error] | | | |
|---------------|------------------|------------------|-------------------------|
| #Error Type | <TAB> Label Name | <TAB> Conditions | <TAB> Comparison Target |
| "Error" | <TAB> "Label01" | <TAB> ">" | <TAB> "-9999.0" |
| "Error" | <TAB> "Label01" | <TAB> "<" | <TAB> "RH" |
| "Warning" | <TAB> "Label01" | <TAB> "<" | <TAB> "9999.0" |

FB property page

| | |
|-----|---|
| (1) | User Setting1 |
| | Label Name Label01 |
| (2) | Data Type Word [Unsigned]/Bit String [16-bit] |
| | Input Range |
| | User Setting1 > -9999.0 |
| | User Setting1 < PV Engineering Value High Limit |
| | Recommended Range |
| | User Setting1 < 9999.0 |
| | Note |

(1): Error
(2): Warning

| No. | Column name | Description |
|-----|-------------------|--|
| ① | Error Type | Set either of the following error types: • Error • Warning |
| ② | Label Name | Set a label name of an FB property to be checked. An FB property of the tag data cannot be set. A label name of a user-defined FB property that is not set in the [Window Configuration] section cannot be set. |
| ③ | Conditions | Set a condition with any of the following symbols: • <, >, <=, >= (comparison) • = (match) • <> (mismatch) |
| ④ | Comparison Target | Set a value or label name to be compared. For a label name, a label name of an FB property of the tag data and the one of a user-defined FB property can be set. A label name of a user-defined FB property that is not set in the [Window Configuration] section cannot be set. |

Point

- Up to 10 error check items can be set for one FB property.
- When the input format of an FB property is a combo box, the set error check contents are not applied to the FB property page.
- The set error check contents are displayed in the 'Note' column of the FB property according to the order in which rows are listed.
An error is displayed in "Input Range" and a warning is displayed in "Recommended Range."
- The order in which rows are listed does not affect the error check contents.

■Check method

An error is checked with the conditional expression in which the following values are set: the setting value of a label set for the 'Label Name' column is on the left-hand side, and the value or setting value of a label set for the 'Comparison Target' column is on the right-hand side.

When the check result is not satisfied, an error of the type set in the 'Error Type' column occurs.

When multiple error checks are set for one FB property, an error occurs if even one check result is not satisfied.

Ex.

For the following example, an error occurs when a value '0' or less or a value greater than the setting value of RH is set for the initial value of "Label," and a warning occurs when a value 1000 or more is set.

| [Check Error] | | | |
|---------------|------------------|------------------|-------------------------|
| #Error Type | <TAB> Label Name | <TAB> Conditions | <TAB> Comparison Target |
| "Error" | <TAB> "Label" | <TAB> ">" | <TAB> "0" |
| "Error" | <TAB> "Label" | <TAB> "<" | <TAB> "RH" |
| "Warning" | <TAB> "Label" | <TAB> "<" | <TAB> "1000" |

■Error condition

The following shows the conditions that cause a format error of the [Check Error] section when reading a setting file.

- Unsettable value is set in the 'Error Type' column.
- A label name of a user-defined FB property that is not set in the [Window Configuration] section is set in the 'Label Name' column or 'Comparison Target' column.
- The maximum number of error conditions that can be set for one FB property is exceeded.
- Unsettable value is set in the 'Conditions' column.

[Editable/Non-editable] section

This section sets whether an initial value can be edited or not for FB properties.

■Example

The following shows the label names to be used in the example and their setting item names.

- Label01: User setting 1
- Label02: User setting 2
- Label03: User setting 3

Setting file

| [Editable/Non-editable] | | | |
|-------------------------|---------------------|----------------------------|-----------------------------|
| #Label Name | <TAB> Setting Value | <TAB> Label Name to Switch | <TAB> Editable/Non-editable |
| "Label01" | <TAB> "0" | <TAB> "Label03" | <TAB> "0" |
| "Label01" | <TAB> "1" | <TAB> "Label03" | <TAB> "1" |
| "Label01" | <TAB> "2" | <TAB> "Label03" | <TAB> "1" |
| "Label02" | <TAB> "0" | <TAB> "Label03" | <TAB> "0" |
| "Label02" | <TAB> "1" | <TAB> "Label03" | <TAB> "1" |

FB property page

| No. | Column name | Description | Restriction |
|-----|-----------------------------|---|-----------------------------------|
| ❶ | Label Name | Set a label name of an FB property which is the switching condition. A label name of an FB property of the tag data and the one of a user-defined FB property can be set. A label name of a user-defined FB property that is not set in the [Window Configuration] section cannot be set. | — |
| ❷ | Setting Value ^{*1} | When the setting value of a label set for ❶ becomes the value set for this column, whether a label set in ❸ can be edited is switched to the state set in ❹. | Maximum number of characters: 100 |
| ❸ | Label Name to Switch | Set a label name of an FB property to be switched. An FB property of the tag data cannot be set. A label name of a user-defined FB property that is not set in the [Window Configuration] section cannot be set. | — |
| ❹ | Editable/Non-editable | Set whether a label can be edited or not as either of the following values: • 0: Non-editable • 1: Editable | — |

*1 When a device/label name is set for ❷, it is treated as a character string, and an initial value of the device/label is not set.
(Example) For the following case, when the initial value of "Label" is Label2 (character string), Label3 is non-editable.

```
[Editable/Non-editable]
#Label Name <TAB> Setting Value <TAB> Label Name to Switch <TAB> Editable/Non-editable
"Label"      <TAB> "Label2"      <TAB> "Label3"      <TAB> "0"
```

- For one FB property which is the switching condition, up to 100 'Editable/Non-editable' settings can be set.
- When a label is non-editable, the item of the FB property page is masked.
- For an FB property that is set as a switching target of the editable/non-editable setting in multiple items, it cannot be edited only when it is set to non-editable in all items.

For the above example, Label03 cannot be edited only when the setting value of Label01 and Label02 is '0.'
When the setting value of Label01 is one or two, or when the value of Label02 is one, Label03 can be edited.

- The order in which rows are listed does not affect the operation.

Precautions

Two or more rows whose contents of the 'Label Name' column, 'Setting Value' column, and 'Label Name to Switch' column are the same cannot be set.

■Error condition

The following shows the conditions that cause a format error of the [Editable/Non-editable] section when reading a setting file.

- A label name of a user-defined FB property that is not set in the [Window Configuration] section is set in the 'Label Name' column or 'Label Name to Switch' column.
- The maximum number of settings that can be set for one FB property which is the switching condition is exceeded.
- The maximum number of characters in the 'Setting Value' column is exceeded.
- Two or more rows whose contents of the 'Label Name' column, 'Setting Value' column, and 'Label Name to Switch' column are the same are set.
- Unsettable value is set in the 'Editable/Non-editable' column.

[Combo Box] section

This section sets the display items in a combo box for FB properties.

One display item in a combo box can be set per row.

■Example

Setting file

```
[Combo Box]
#Label Name <TAB> Item Name
"label02" <TAB> "Item1"
"label02" <TAB> "Item2"
"label02" <TAB> "Item3"
"label03" <TAB> "Item1"
"label03" <TAB> "Item2"
"label03" <TAB> "Item3"
```

① ②

FB property page



| No. | Column name | Description | Restriction |
|-----|-------------|--|--------------------------------------|
| ① | Label Name | Set a name of a label whose input format is set to combo box in the [Window Configuration] section. A name of other labels cannot be set. | — |
| ② | Item Name | Set an item name in a combo box. | Maximum number of characters: 100 |

Point

- Up to 100 combo boxes can be set.
- The items in a combo box are displayed according to the order in which rows are listed.
- The setting value is set as 0, 1, 2.. in order from the top item.

Precautions

Two or more items with the same name cannot be set for one combo box.

■Error condition

The following shows the conditions that cause a format error of the [Combo Box] section when reading a setting file.

- A name of a label whose input format is not set to combo box in the [Window Configuration] section is set in the 'Label Name' column.
- The maximum number of items in a combo box is exceeded.
- Items with the same name are defined for one combo box.
- The maximum number of characters of a combo box is exceeded.
- The setting of an FB property whose input format is set to combo box in the [Window Configuration] section does not exist in the [Combo Box] section.


[Help Reference] section

This section sets the page of a manual to be displayed when clicking the [Help] button for FB properties.

■Example

Setting file

| | |
|------------------|----------------------------|
| [Help Reference] | |
| #Label Name | <TAB> Help Reference |
| "RH" | <TAB> "SH081749ENG-364.P2" |
| "HH" | <TAB> "SH081749ENG-362.P4" |
| "Label01" | <TAB> "SH081749ENG-1DE.P2" |
| "Label02" | <TAB> "SH081749ENG-1DE.P2" |
| "Label03" | <TAB> "SH081749ENG-1DE.P2" |

| No. | Column name | Description |
|-----|----------------|--|
| ① | Label Name | Set a label name of an FB property to set the help reference. A label name of an FB property of the tag data and the one of a user-defined FB property can be set. A label name of a user-defined FB property that is not set in the [Window Configuration] section cannot be set. |
| ② | Help Reference | Set the page ID of the following manual*1:  MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions) A page ID of other manuals cannot be set. |

*1 By clicking the page ID displayed on the bottom right of e-Manual Viewer, it can be copied.
For details on the page ID, refer to e-Manual Viewer Help.

Point

- For an FB property of the tag data and user-defined FB properties in which the help reference is not set, a default help reference is set.
- The order in which rows are listed does not affect the operation.

■Default help reference

For a default help reference, the first page of the following tag FBs is set for each tag type.

| Tag type | Tag FB |
|----------|-----------------|
| PID | M+M_PID_DUTY_T |
| 2PID | M+M_2PID_DUTY_T |
| 2PIDH | M+M_2PIDH_T |
| PIDP | M+M_PIDP_EX_T |
| SPI | M+M_SPI_T |
| IPD | M+M_IPD_T |
| BPI | M+M_BPI_T |
| R | M+M_R_T |
| ONF2 | M+M_ONF2_T |
| ONF3 | M+M_ONF3_T |
| MONI | M+M_MONI |
| MWM | M+M_MWM |
| BC | M+M_BC |
| PSUM | M+M_PSUM |
| SEL | M+M_SEL_T3 |
| MOUT | M+M_MOUT |
| PGS | M+M_PGS |
| PGS2 | M+M_PGS2 |
| SWM | M+M_SWM |
| PVAL | M+M_PVAL_T |
| HTCL | M+M_HTCL_T |
| NREV | M+M_NREV |
| REV | M+M_REV |

| Tag type | Tag FB |
|----------|-------------------|
| MVAL1 | M+M_MVAL1 |
| MVAL2 | M+M_MVAL2 |
| TIMER1 | M+M_TIMER1 |
| TIMER2 | M+M_TIMER2 |
| COUNT1 | M+M_COUNTER1 |
| COUNT2 | M+M_COUNTER2 |
| PB | M+M_PB_ |
| MTR2 | M+M_MTR2 |
| MTR3 | M+M_MTR3 |
| SS2P | M+M_SS2P |
| DS2P | M+M_DS2P |
| DS3P | M+M_DS3P |
| ALM | M+M_ALARM |
| ALM_64PT | M+M_ALARM_64PT_ |
| MSG | M+M_MESSAGE |
| MSG_64PT | M+M_MESSAGE_64PT_ |

Precautions

Multiple rows cannot be set for one FB property.

■Error condition

The following shows the conditions that cause a format error of the [Help Reference] section when reading a setting file.

- Multiple help references are set for one FB property.
- A label name of a user-defined FB property that is not set in the [Window Configuration] section is set in the 'Label Name' column.
- A page ID of the manual other than the following is specified:

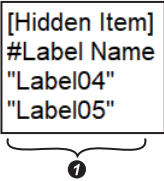
 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

[Hidden Item] section

This section sets an FB property not to be displayed on the FB property page.

■Example

Setting file



| No. | Column name | Description |
|-----|-------------|---|
| ① | Label Name | Set a label name of an FB property not to be displayed on the FB property page. An FB property of the tag data cannot be set. A label name of a user-defined FB property set in the [Window Configuration] section cannot be set. |

■Error condition

The following shows the condition that causes a format error of the [Hidden Item] section when reading a setting file.

- A label name of an FB property set in the [Window Configuration] section is set.

Common considerations for all sections

■When the language of a setting file is different from the display language of GX Works3

A template file is created according to the display language of GX Works3.

When the language of a section name in a setting file and the one of 'Error Type' in the [Check Error] section is different from the display language of GX Works3 in which the FB property page is displayed, reading the setting file fails.

The FB property page can be displayed by correcting a section name in the setting file and 'Error Type' in the [Check Error] section to the section name in the template file created in GX Works3 in which the FB property page is displayed.

When the [Help Reference] section is set, change the help reference to the page ID of a manual whose language is same with the display language of GX Works3.

■When an FB property of the tag data and a user-defined FB property with the same name exist

When an FB property of the tag data cannot be set, it is treated as a user-defined FB property.

When an FB property of the tag data and user-defined FB property can be set, the user-defined FB property is prioritized.

■When the same user-defined FB property exists

An FB property displayed higher in the "FB Property" window is set.

■The number of items that can be set in each section

The maximum number of items that can be set in each section includes the user-defined settings and settings of the tag data.

■Error condition

The following shows the conditions common to all sections that cause a format error when reading a setting file.

- The [Window Configuration] section is not set as the first section.
- A non-existent section is set (including a case in which the language of a section name is different from the display language of GX Works3 in which the FB property page is displayed).
- Same section is set two or more times.
- The number of columns is less than the required number.
- A line feed is not inserted at the end of a row.
- The begging and end of a column are not enclosed with " (double quotes).

FB property management (offline)

In the "FB Property Management (Offline)" screen, initial values of FB properties saved in a project can be exported to a CSV file.

In addition, the initial values of FB properties can be imported from the CSV file, and the values can be set as the initial values of FB properties in the project.

For details on FB properties, refer to the following:

📖 Page 387 Display/setting an FB property

FB Property Management (Offline) screen

The following explains the "FB Property Management (Offline)" screen.

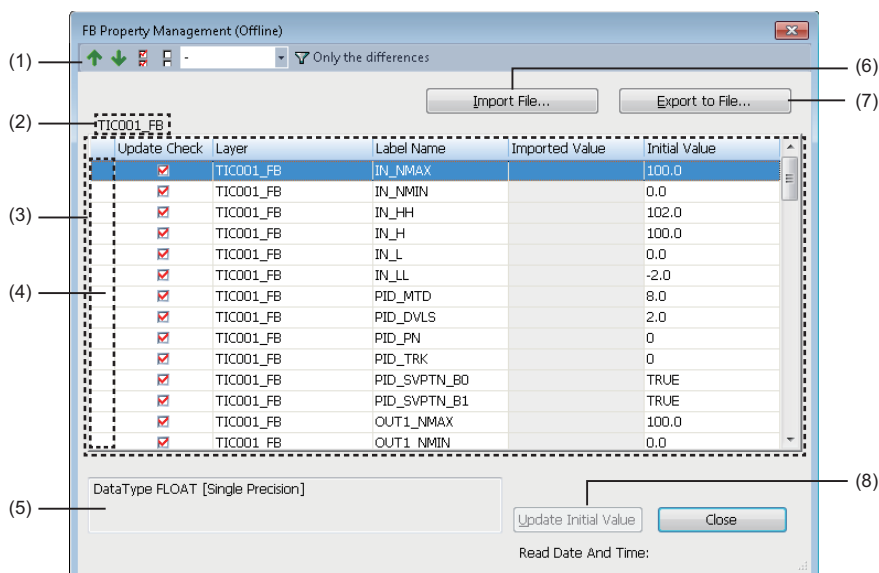
Window

■Updating the initial value of a selected FB property

1. Select a function block or tag FB in any of the following editors:

- Ladder editor
- ST editor
- FBD/LD editor
- Tag FB setting editor

2. Right-click it and select [FB Property] ⇨ [FB Property Management (Offline)] from the shortcut menu.



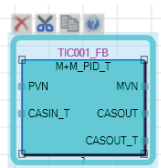
Point

The "FB Property Management (Offline)" screen can be displayed in the following cases only.

- Ladder editor: An FB instance is selected.
- ST editor: The cursor is placed on a token, or the whole token is selected.

```
FbPou_1_1();  
FbPou_1_1();
```

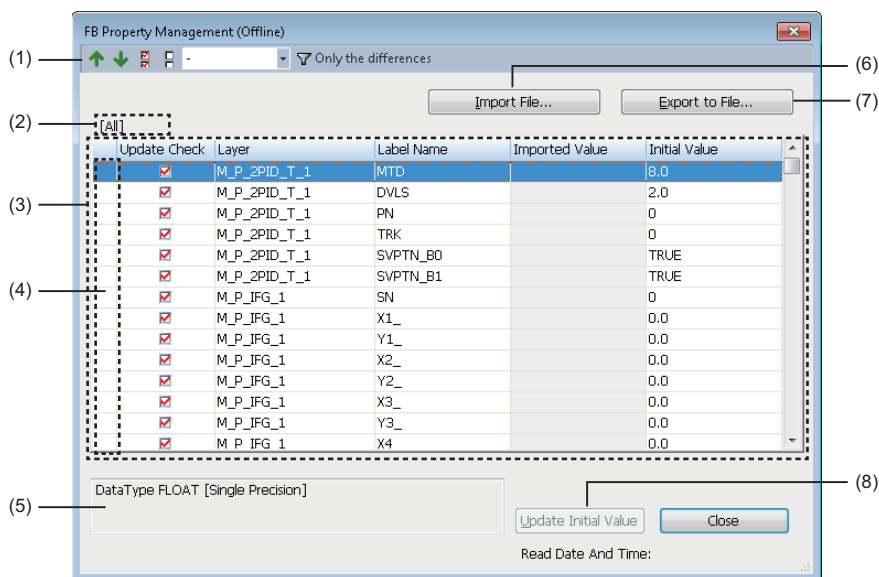
- FBD/LD editor: A whole function block is selected.





■Managing the initial values of all FB properties

Select [Tool] ⇒ [FB Property Management (Offline)].

Alternatively, select  (FB Property Management) ⇒ [FB Property Management (Offline)] on the tool bar.



Displayed items

| Item | Description |
|-----------------------------------|--|
| (1) Toolbar | The displayed items are the same as the ones displayed in the "FB Property Management (Online)" screen. ^{*1} For details, refer to the displayed items in the "FB Property Management (Online)" screen.  Page 689 FB Property Management (Online) screen |
| (2) FB instance name | |
| (3) FB property list | |
| (4) Header | |
| (5) Explanation column | |
| (6) [Import File] button | Click this to import the initial values of FB properties in a CSV file. |
| (7) [Export to File] button | Click this to export the initial values of FB properties displayed in the FB property list to a CSV file. |
| (8) [Update Initial Value] button | For details, refer to the displayed items in the "FB Property Management (Online)" screen.  Page 689 FB Property Management (Online) screen |

*1 "Current Value" in the "FB Property Management (Online)" screen is displayed as "Imported Value" in the "FB Property Management (Offline)" screen.

Point

Once the initial value is updated, a program related to a label of which the initial value was updated will be in the unconverted state.

Format

The following shows the CSV file formats.

■Exported CSV file

A saved CSV file opened in spreadsheet software is displayed as follows:

| | | | |
|---------------|----------------|------------|---------------|
| PROJECT01 | | | |
| Exported Date | 2019/3/4 11:59 | | |
| Update Check | Layer | Label Name | Initial Value |
| 1 | TIC001_FB | IN_NMAX | 100 |
| 1 | TIC001_FB | IN_NMIN | 0 |
| 1 | TIC001_FB | IN_HH | 102 |
| 1 | TIC001_FB | IN_H | 100 |
| 1 | TIC001_FB | IN_L | 0 |
| 1 | TIC001_FB | IN_LL | -2 |
| 1 | TIC001_FB | PID_MTD | 8 |
| 1 | TIC001_FB | PID_DVLS | 2 |
| 1 | TIC001_FB | PID_PN | 0 |
| 1 | TIC001_FB | PID_TRK | 0 |

(1): Header

(2): Data segment

The following describes the detailed formats of a CSV file.

- The file format is Unicode (UTF-16 Little Endian with BOM).
- Items are delimited by '\t' (a tab).
- Each item is enclosed with " (double quotes).
- When " (a double quote) is included in an item, "" (two double quotes) are displayed for each " (double quote) in the item.
- A line feed is inserted at the end of a row. The line feed code is LF.
- The character strings which match with the column titles in the "FB Property Management (Offline)" screen are displayed in the header (1).
- Item names in the header (1) are exported in a language set for the display language of GX Works3. (Page 49 Display Language Switching)
- For FB properties whose checkbox in the "Update Check" column in the "FB Property Management (Offline)" screen is selected, '1' is displayed in the "Update Check" column of the CSV file. For ones whose checkbox is not selected, '0' is displayed.

■CSV file to be imported

Edit an exported CSV file according to the following formats:

- Enclose an item including a line feed code with " (double quotes).
- Enter the header (1) in the third row.
- Edit the header (1) to match the item names and order with the header (1) in the exported CSV file.
- To import data from a CSV file exported in GX Works3 with a different language, edit the character strings of header (1) in the CSV file to match with the column titles in the import target "FB Property Management (Offline)" screen.
- Enter '1' in the "Update Check" column in the CSV file so that the checkbox for the FB property, for which '1' was entered, in the "Update Check" column in the "FB Property Management (Offline)" screen will be selected. Enter '0' so that the checkbox will not be selected.
- In the "Initial Value" column, enter values which can be entered in the "Initial Value" column in a label editor of GX Works3. The values which cannot be entered will not be imported.
- A row can be added to later than 'E' column; however, the row can will not be imported.


6.8 Registering Device Comments

This section explains the features and setting methods for device comments.

Device comments

Two types of device comments can be created: one that can be set in common and one that can be set for each program. The following shows device comments of GX Works2 and GX Developer corresponding to each device comment of GX Works3.

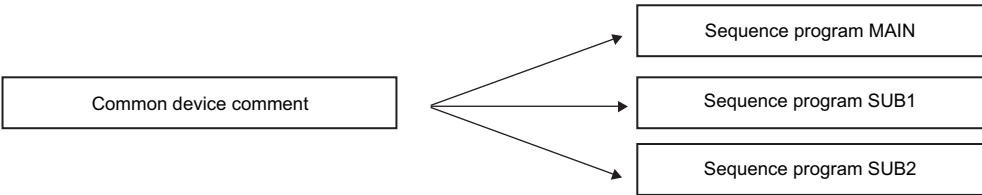
| GX Works3 | GX Works2 | GX Developer |
|-----------------------------|-----------------------|---------------------------|
| Common device comment | Global device comment | Common comment |
| Each program device comment | Local device comment | Device comment by program |

Up to 16 device comments can be set for one device. ( Page 83 Displaying and Reading Comments)
Comments can be set in Japanese, English, Chinese or other languages, and the display language in GX Works3 can be switched among these languages.


- Difference between a device comment and a label comment
'Device comment' refers to a comment that is added to devices, and also 'data' read from/written to a CPU module.
'Label comment' refers to a comment that is added to a defined label.

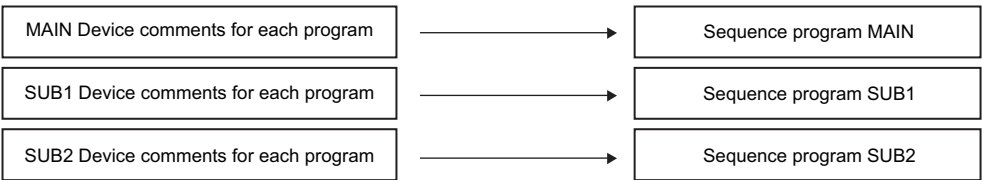
Common device comment

'Common device comment' refers to a device comment that can be used in multiple program files. (It can also be used in only one program file.)
When creating a new project, "Common Device Comment" is automatically created in the navigation window.
Only the device comments set in this data can be used as common device comments.



Each program device comment

'Each program device comment' refers to a device comment that can be used only in one program file.
To use each program device comments, create data for setting device comments in "Each Program Device Comment" in the navigation window. ( Page 132 Creating data)
Only the device comments set to data with the same name as a program file can be used as each program device comments for the program file.



Precautions

- Device comments set in "Each Program Device Comment" cannot be written to an FX5CPU.
- Remote head modules do not support each program device comments.

■Setting an each program device comment

When comments are set both in "Common Device Comment" and in "Each Program Device Comment," specify the comment to be displayed on a program editor by setting the following option:

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target"

Ex.

When different device comments are set for the same device (M)

Common device comment (COMMENT)

| Device Name | M0 | Detailed Conditions |
|-------------|-----------------|---------------------|
| Device Name | Comment | |
| M0 | | |
| M1 | Initial Start 1 | |
| M2 | Initial Start 2 | |

Device comments for each program (MAIN)

| Device Name | M0 | Detailed Conditions |
|-------------|---------------|---------------------|
| Device Name | Comment | |
| M0 | | |
| M1 | Stop Device 1 | |
| M2 | Stop Device 2 | |

The display differs as shown below according to the option setting.

●When the reference of the device M in the sequence program MAIN is set to the common device comment <Options>

☒ Reference/Reflection Target for Device Comment

Reference/Reflect the Other Device Comment When S Yes ▼

☒ MAIN Mixed ▼

M Common ▼

↓

<Sequence program MAIN>

The global device comment, 'Initial Start 1', is displayed as a device comment for M1.

●When the reference of the device M in the sequence program MAIN is set to the device comment for each program <Options>

☒ Reference/Reflection Target for Device Comment

Reference/Reflect the Other Device Comment When S Yes ▼

☒ MAIN Mixed ▼

M Each Program ▼

↓

<Sequence program MAIN>

The local device comment, 'Stop Device 1', is displayed as a device comment for M1.

When any comments do not exist in the reference that was set in "Reference/Reflection Target for Device Comment," the other comment is displayed.

Applicable devices

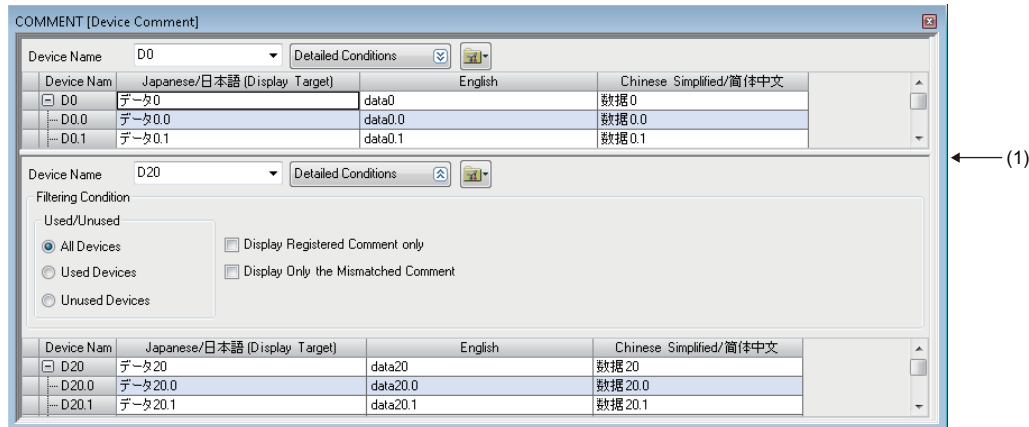
For the device types and comment setting availability, refer to the following:

📖 Page 929 Applicable Devices in GX Works3

Configuration of a device comment editor


Window

- Common device comment: Select "Device" ⇒ "Device Comment" ⇒ "Common Device Comment" in the navigation window.
- Each program device comment: Select "Device" ⇒ "Device Comment" ⇒ "Each Program Device Comment" ⇒ "(data name)" in the navigation window.



(1): Splitter bar


A device comment editor can vertically or horizontally be split into two screens by using any of the following menus.

- Select [Window] ⇒ [Split]. (Vertical split only)
- Right-click on the screen, and select [Split] from the short-cut menu ⇒ [Vertical Split]/[Horizontal Split]
- Click , and select [Split] ⇒ [Vertical Split]/[Horizontal Split]

Point

- Pressing the **[Ctrl] + [Enter]** keys creates a line break in a comment column.
- The hidden comment is displayed by double-clicking + in the device name column.



- When linefeed comments are set in multiple lines, the comments can be displayed in a batch by using the following menu:
 - [Edit] ⇒ [Show All Linefeed Comments]
- Fonts can be changed. ( Page 82 Checking and Changing Colors and Fonts)

Displaying a device comment editor from a program editor

A device comment editor can be displayed from a program editor.

The device comment editor to be displayed depends on the setting in the following option:

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target"

When any comments do not exist in the reference that was set in "Reference/Reflection Target for Device Comment," the other comment editor is displayed.

Operating procedure

1. Open a program editor.
2. Select [View] ⇒ [Open Device Comment Setting] ⇒ [Open in Front]/[Tile Horizontally].

Precautions

When selecting a device on a program editor, the device comment editor corresponding to the selected device will appear.

For an ST editor, place the mouse cursor over a device to select.

When using the menu without selecting a device, the device comment editor to set common device comments will appear.



In another way to display a program editor and device comment editor vertically, press **Ctrl** + **Alt** + **C** keys.

Creating device comments

Comments can be created for each device in a device comment editor.

Adding device comments make it easy to understand the content of program processing.

To create each program device comments, create data for the device comments in advance. (📖 Page 132 Creating data)

The comments can be entered on a ladder editor. For details, refer to the following:

📖 Page 295 Entering/editing comments

Operating procedure

1. Enter the device of which comment is to be set in "Device Name."
2. Enter a comment for "Comment."

Point

- Up to 1024 characters can be entered for one comment.
- Setting a smaller number for the number of characters for a comment can reduce in size of data to be written to a CPU module.
The number of characters can be set in the following option.
[Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Device Comment Editor" ⇒ "Number of Editing/Displaying Characters" ⇒ "Number of Device Comment Editing/Displaying Characters"
- By selecting two or more consecutive cells in which the comment with number is inserted, and dragging the '+' symbol displayed at the lower right corner of the cell, the data of which number is incremented can be entered.
- When cutting/copying the hidden bit-specified word device comments, select the range and [Edit] ⇒ [Cut the Range Including Hidden Bit Specification Information]/[Copy the Range Including Hidden Bit Specification Information].
The bit-specified comments can also be pasted regardless of the setting of display/hidden by selecting [Edit] ⇒ [Paste the Range Including Hidden Bit Specification Information].

6

Precautions

For device comments, use characters in the Unicode Basic Multilingual Plane.

Creating multiple comments and setting display target

For details, refer to the following:

📖 Page 83 Displaying and Reading Comments

Detecting devices with empty cell

When comments are set in the multiple rows, detect the devices with empty cells.

Operating procedure

■ Detecting comments from device data being displayed on a device comment editor

Select the checkbox of "Display Only the Mismatched Comment" in the filter condition on a device comment editor.

■ Detecting comments from all device data in the device comment data

Select [Edit] ⇒ [Detect the Mismatched Comment].

Double-click "NG" in the displayed "Detect the Matched Comment of All Devices" screen to edit a device comment editor.

Device comment including @

By selecting "Yes" for the following option and using '@' for device comments, options of devices can be refined when searching for/replacing a device, inputting it in a program, or registering it in a watch window.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

Moreover, by applying the explanations of link devices to the device comments of refresh devices which are assigned to a device station on CC-Link IE TSN in advance, the refresh devices can be refined with their device comments.

Ex.

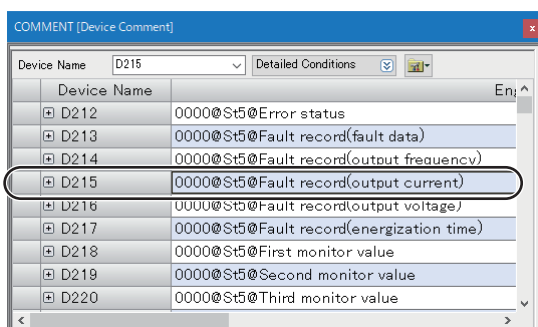
The following explains the method to refine refresh devices with a device comment when inputting a refresh device on a device station of CC-Link IE TSN (FR-A800-GN) in a program.

Operating procedure

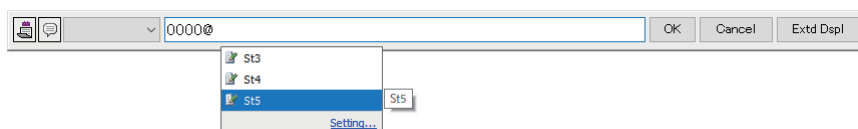
1. Apply the explanations of link devices for FR-A800-GN to the device comments of refresh devices. (Page 221 Applying explanations to device comments)

Each character string delimited by @ indicates the following:

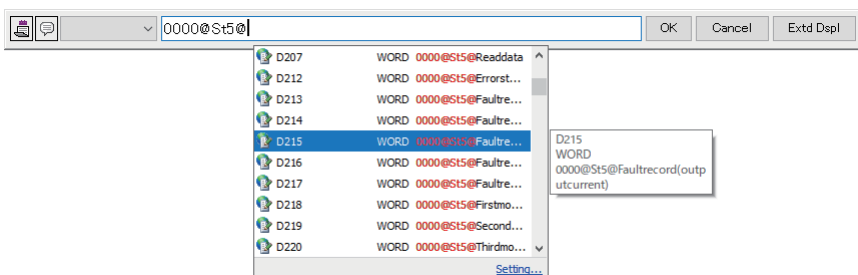
- Start I/O number of a CC-Link IE TSN module (Example: 0000)
- Station number of FR-A800-GN (Example: St5)
- Explanation of the link device (Example: Fault record (output current))



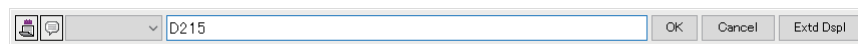
2. Display the element entry dialog in a ladder editor. (Page 281 Inserting from the element entry dialog)
3. Enter "0000@" in the element entry dialog to search refresh devices of the device station whose start I/O number is '0000.'



4. Double-click "St5" from the options, then enter '@' to search refresh devices of the device station whose station number is '5.'



5. Double-click the device for which the comment matching the intended use in the program is set. The device is applied to the element entry dialog.



Deleting unused device comments

Unused comments in a program can be deleted in a batch. To delete the comments, open a device comment editor in advance.

Operating procedure

Select [Edit] ⇨ [Delete Unused Device Comment].

| Deletion target | |
|-----------------------------|---|
| Device comment type | Deletion target |
| Common device comment | Unused device comments in all programs |
| Each program device comment | Unused device comments in the corresponding program |
| | Device comments in all programs |

Clearing all device comments

The comments set to device comment data can be deleted in a batch.

Operating procedure

■Deleting all device data in the device comment data

Select [Edit] ⇨ [Clear All (All Devices)].

■Deleting device data being displayed on a device comment editor

Select [Edit] ⇨ [Clear All (Displayed Devices)].

Exporting/importing device comments

Device comments can be exported/imported to/from a CSV file.

When multiple comments are set, the comments of which the checkboxes in the "Available" column are selected in the "Multiple Comments Display Setting" screen are output.

Exporting

Write a device comment to a CSV file.

When exporting one file only, the CSV file needs to be saved with an arbitrary name.

When exporting multiple files, CSV files are saved with the same name as device comments in an arbitrary folder.

Operating procedure

1. According to the number of files that will store device comments, perform the following operation.
 - One file: Select and right-click a device comment to export in the navigation window, then select [Export to File] from the shortcut menu.
 - Multiple files: Select "Device" ⇨ "Device Comment" in the navigation window, then right-click it and select [Export to Multiple Files] from the shortcut menu.
2. Set the extended setting as necessary, then click the [Yes] button.
3. Select a folder that will store the exported file(s) in the "Export to File" screen/"Specify Folder to Export" screen, and click the [Save] or [OK] button.

Point

By selecting "Write comment data to different files sorted by target device types." in the extended setting, files split for each device type can be output.

The file name of an output file is "(data name)" + "(device symbol)" + ".CSV". When "\" is included in a device symbol, it is replaced to "_".

Precautions

- When an error occurs during export of multiple files, the processing will terminate with saving the device comments exported until then.
- When no device comment is set for all devices, a file(s) is not output by exporting a device comment(s).

Importing

Import a comment in a CSV file to a device comment.

When importing one file only, it will be imported in the selected device comment.

When importing multiple files, they will be imported in the device comments which have the same file names.

If a device comment, which has a same file name, does not exist, a new device comment will be created.

Operating procedure

1. According to the number of files to be imported, perform the following operation.
 - One file: Select and right-click a device comment to import a file in the navigation window, then select [Import File] from the shortcut menu.
 - Multiple files: Select "Device" ⇒ "Device Comment" in the navigation window, then right-click it and select [Import Multiple Files] from the shortcut menu.
2. Set the extended setting as necessary, then click the [Yes] button.
3. Select a file(s) to be installed in the "Import File" screen, and click the [Open] button.

Point

Files exported for each device type can be imported in a batch by selecting [Import Multiple Files] from the shortcut menu.

Precautions

- When exporting files by splitting them for each device type, a device symbol is added to each file name. When importing them, devices defined in the files are read regardless of the device symbols of file names.
- When a device comment, that exceeds the applicable number of characters, is set in a device comment editor, a warning message appears in the "Output" window and the excessive characters are deleted.
- When importing multiple files, they are read in ascending order of the file names. When the same device exist in multiple files, the comment in the file read later are applied.
- When an error occurs during import of multiple files, the processing will terminate with saving the device comments imported until then.

CSV file format

The column titles in a device comment editor and header names in a CSV file are linked.

- In a device comment editor, only the data of which column titles match with header names in a CSV file is imported.
- Data can be imported even when the column order in a CSV file does not match with that in a device comment editor.
- To import data from a CSV file exported in GX Works3 with a different language, edit the header names in the CSV file to match with the column titles displayed in a device comment editor of the import target GX Works3.

Point

The CSV files exported with GX Works2 can be imported in GX Works3.

When multiple comment display is set, edit the header names in a CSV file exported from GX Works2 to match with the column titles in a device comment editor of GX Works3, and then import the file.

Searching for device comments

To search for a device comment, refer to the following:

 Page 466 Searching for/Replacing Character Strings

Reading sample comments

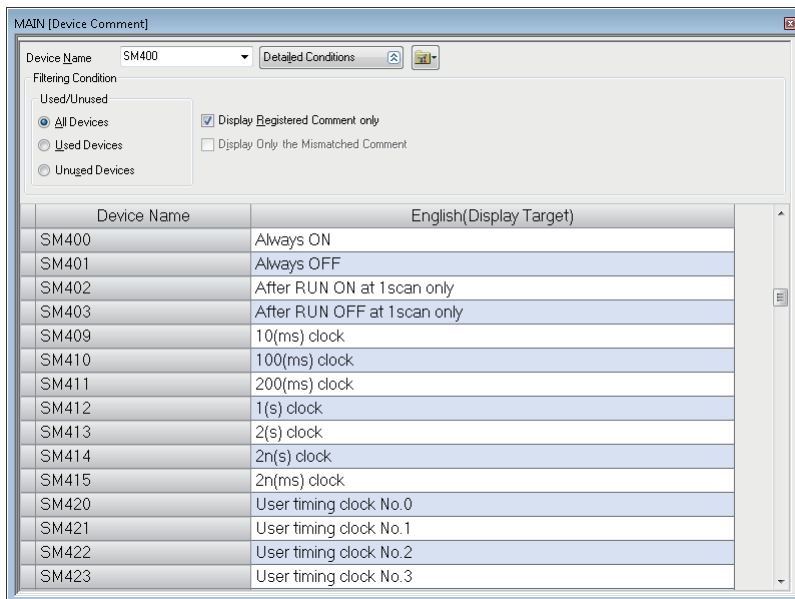
The sample comments of system devices (special relays/special registers), CPU buffer memory access devices, and intelligent function modules can be applied to a device comment editor automatically.

Operating procedure

1. Open a device comment editor.
2. Select [Edit] ⇒ [Read from Sample Comment].
3. Set each item in the "Read from Sample Comment" screen, and click the [OK] button.

The sample comments are applied to a device comment editor.

Ex.



Precautions

When reading sample comments of an intelligent function module, the data size may exceed the memory capacity of the CPU module and data may not be written. In this case, prepare an SD memory card.

The writable capacity of an SD memory card installed in an FX5CPU is the same as that of the FX5CPU module itself.

FX5CPUs do not support sample comments of CPU buffer memory.

Point

By selecting "Yes" for the following option, when adding an intelligent function module to a project, the sample comments for the module are automatically applied to the device comment editor of "Common Device Comment."

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Add New Module" ⇒ "Operation Setting" ⇒ "Read Sample Comment"

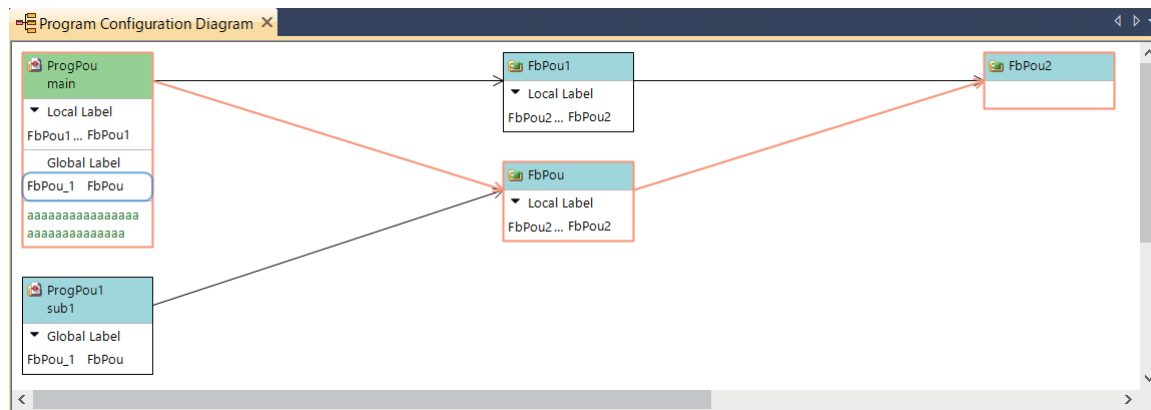
6.9 Checking/Editing the Relation between Programs

This section explains the method for checking the relation between the following data in a project with a diagram and editing the data on the diagram:

- Program block
- Function block
- Function

Window

Select [Tool] ⇒ [Program Configuration Diagram].



Data in a project is displayed as a block, and the associated data is connected to each other with a connection line.

Operating procedure

Switch the display mode/edit mode according to the intended use of a program configuration diagram.

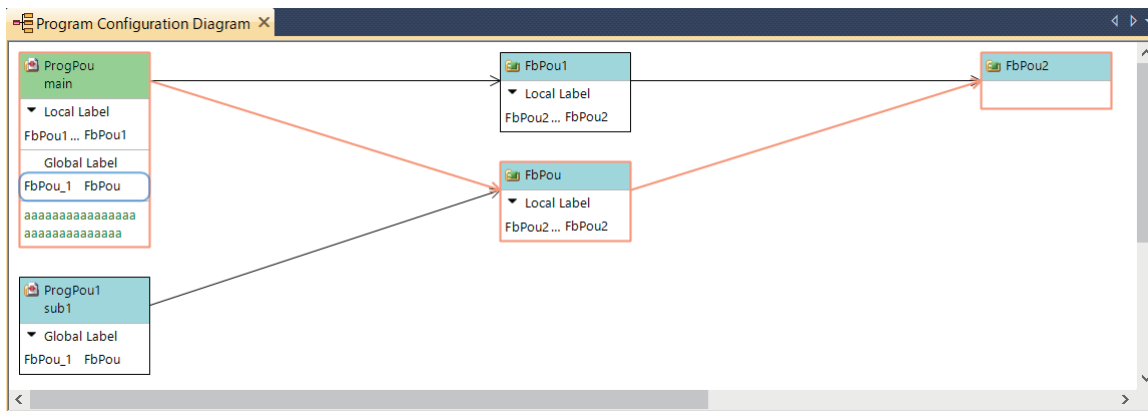
| Mode | Purpose | Operation | Reference |
|--------------|--|---|-----------------------|
| Display mode | To check a program configuration diagram | Select [Edit] ⇒ [Mode] ⇒ [Display Mode]. | Page 422 Display mode |
| Edit mode | To edit a program configuration diagram | Select [Edit] ⇒ [Mode] ⇒ [Edit Mode].* ¹ | Page 426 Edit mode |

*¹ When the displayed program configuration diagram is old, the mode cannot be switched to the edit mode. In this case, update the program configuration diagram. (☞ Page 422 Updating a program configuration diagram)

Display mode

This mode is used to check a program configuration diagram.

By selecting a block or label on a block in the display mode, the selected block and associated block with the selected block or label are marked with orange frames.



Operating procedure

■Selecting a block from the navigation window

By selecting data in the navigation window, then right-clicking and selecting [Select in Program Diagram] from the shortcut menu, the cursor can be placed on the block of the selected data.

■Expanding/collapsing a block

By selecting a block in "Program Configuration Diagram," then right-clicking and selecting [Expand/Collapse] from the shortcut menu, the display status of the selected block can be changed.

To change the display status of all blocks, select [Edit] ⇒ [Expand/Collapse All].

■Filtering a block

By selecting a block in "Program Configuration Diagram" or selecting a label on a block then right-clicking and selecting [Filter] from the shortcut menu, only the blocks that are associated with the selected block or label can be filtered.

■Updating a program configuration diagram

By right-clicking in "Program Configuration Diagram" and selecting [Update Configuration Diagram] from the shortcut menu, the display contents of the program configuration diagram can be updated.



Whether to retain the position or size of a block at the update can be set by setting the following option:

- [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Program Configuration Diagram" ⇒ "Update Configuration Diagram" ⇒ "Keep Element Arrangement"

Precautions

If "Program Configuration Diagram" has been opened even once, the contents cannot be updated even if "Program Configuration Diagram" is closed after editing data and then opened again. Update the contents manually by following the procedure in this section.

■Displaying a label editor

By selecting a block in "Program Configuration Diagram," then right-clicking and selecting [Open Label Setting of Selected Element] ⇒ [Open in Front]/[Tile Horizontally] from the shortcut menu, a local label editor of the selected block can be displayed.

Point

- A label editor can also be displayed by double-clicking a local label or global label on a block. In this case, the cursor is placed on the double-clicked label on the label editor.
- A global label editor can be displayed by selecting a global label on a block, then right-clicking and selecting [Open Label Setting of Selected Element] ⇒ [Open in Front]/[Tile Horizontally] from the shortcut menu.

■Displaying a program editor

By selecting a block in "Program Configuration Diagram," then right-clicking and selecting [Open Program Body of Selected Element] ⇒ [Open in Front]/[Tile Horizontally] from the shortcut menu, a program editor of the selected block can be displayed.

Point

A program editor can also be displayed by double-clicking data other than local labels and global labels on a block.

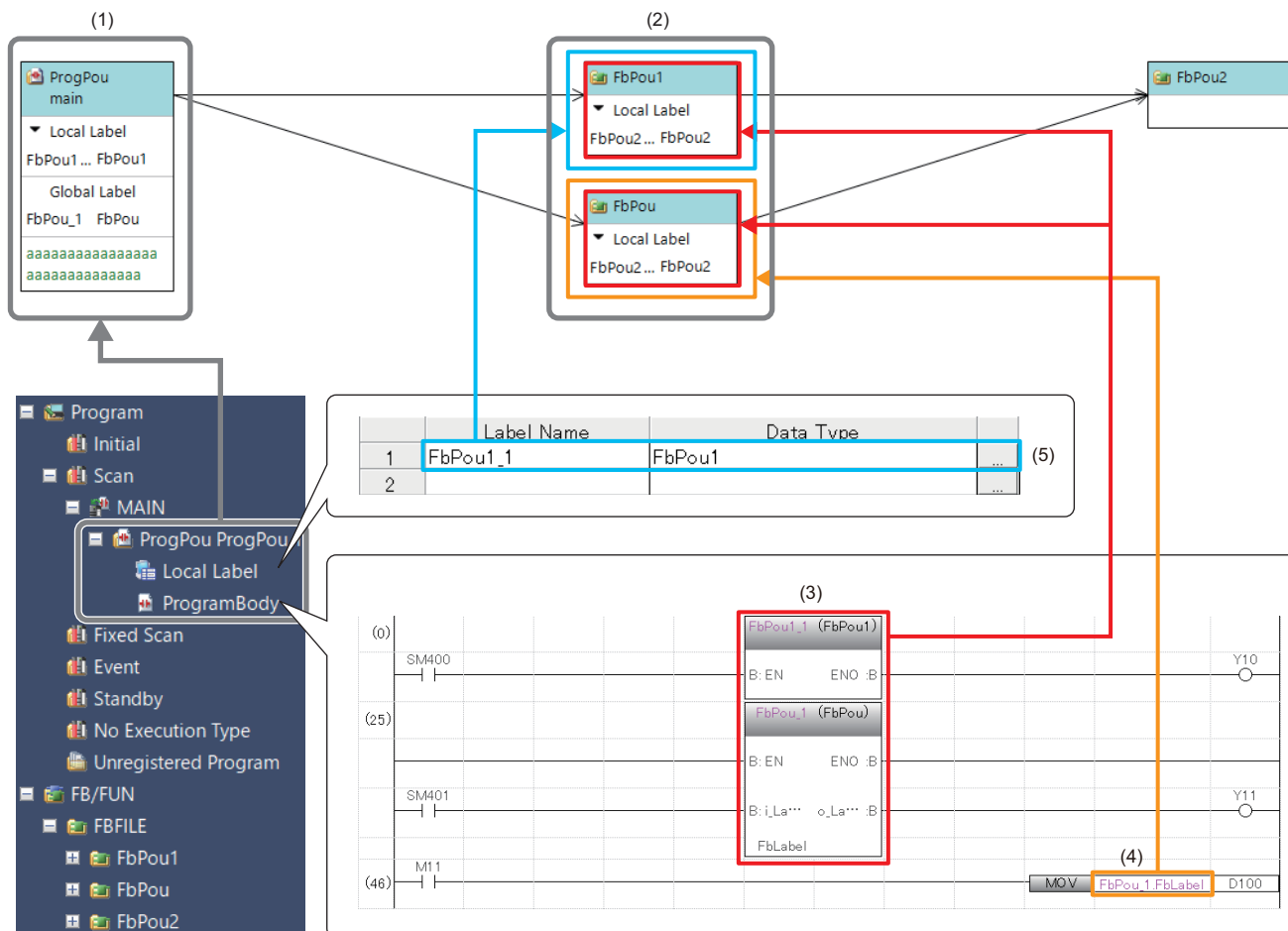
| Information to be displayed | |
|-----------------------------|-----|
| 1 | 1 |
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| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
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| 98 | 98 |
| 99 | 99 |
| 100 | 100 |

■ Relation between data

In a program configuration diagram, a block of the source data (1) is placed on the left , and a block of the associated data (2) is placed on the right.

The relations between the displayed data are as follows:

- (3): An associated function block and function (2) are called from the program body of the source data (1).
- (4): Associated data (2) is used in the program body of the source data (1).
- (5): A label of the data type for the associated data (2) is registered in a label editor of the source data (1).



■ Local label and global label

A label of the data type for the associated data is displayed on a block among the labels registered to a label editor.

■Data name and comment

- Data names and comments set to a program block, function block, and function are displayed in a block.
- By selecting [View] ⇒ [Display Title]/[Display comment], it can be switched to show or hide the data name or comment in a block.

■Setting data to be displayed in a configuration diagram

Data to be displayed in a program configuration diagram can be set in the following option:

- [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Program Configuration Diagram" ⇒ "Update Configuration Diagram" ⇒ "Auto-generation Target"

When updating a program configuration diagram after setting the above option to "No," an element which is no longer generated automatically is deleted from the program configuration diagram, and editing information such as a position of the element is discarded.

Information not to be displayed

The following data may not be displayed in a program configuration diagram:

- Data protected by security
- Instructions in a ladder
- Manufacturer-provided function blocks/functions that do not have the source data
- Manufacturer-provided function blocks/functions associated with other manufacturer-provided function blocks/functions

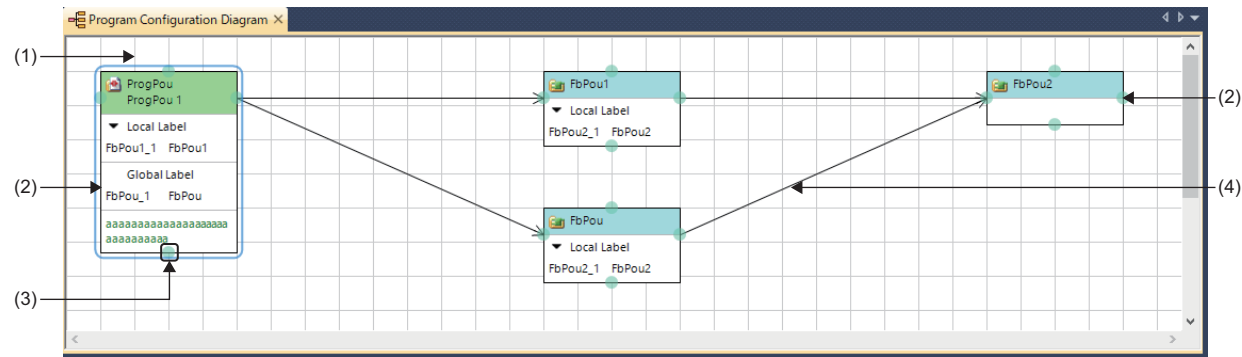
Considerations

If a program is in the unconverted state, a program configuration diagram may not be displayed properly.


Edit mode

This mode is used to edit a program configuration diagram.
By editing the data on the program configuration diagram, the edited contents are accordingly reflected to a project.

Window



Displayed items



| Item | Description |
|----------------------|--|
| (1) Grid | A grid line that serves as markers to place the blocks. |
| (2) Block | The following data in a project is displayed: <ul style="list-style-type: none">• Program block• Function block• Function |
| (3) Connection point | A terminal point of when connecting blocks with a connection line. <ul style="list-style-type: none">• Blue: Can be connected• Red: Cannot be connected |
| (4) Connection line | A line that indicates the relation between data. For details, refer to the following:  Page 424 Information to be displayed When a connection line is changed, the label of the data type before the change used in the relation source block is changed to the label of the target data type. |

Operating procedure

■Adding a block

The following explains the procedure to add a program block and function block.


1. Perform any of the operations:

| Operation | Operating procedure |
|-------------------------|---|
| Enter from an edit box | Select a cell to which a block is to be added, then enter a data name directly. |
| Insert from a menu | Select [Edit] ⇒ [Element] ⇒ [Program Block]/[Function Block]. |
| Insert from the toolbar | Select  (Program Block)/  (Function Block). |

2. Set each item in the "New Data" screen, then click the [OK] button.

■Adding a label

The following explains the procedure to add a label to a block.

1. Connect a block to which a label is to be added (source block) to an associated block. ( Page 427 Common operations of elements)
2. Set each item in the "Undefined Label Registration" screen and click the [OK] button.

Common operations of elements

| Operation | | Operating procedure |
|-------------------------------|--------------------|--|
| Change | To change a name | <ul style="list-style-type: none"> Double-click an element of which the name is to be changed, and enter a new name in the edit box. Select an element of which the name is to be changed, and press the [F2] key, then enter a new name in the edit box. |
| | To change the size | <ol style="list-style-type: none"> Place the cursor on the frame of a block of which size is to be changed. The icon of the cursor changes. Move the cursor vertically with the frame being held. |
| Move | | <ul style="list-style-type: none"> Drag and drop a block to be moved. Select a block to be moved, and press the [Ctrl] + [Shift] + [←] / [→] / [↑] / [↓] keys. |
| Copy ^{*1} | | <ul style="list-style-type: none"> Select a block to be copied, and select [Edit] ⇒ [Copy]. Select a block to be copied, and press the [Ctrl] + [C] keys. |
| Paste | | <ul style="list-style-type: none"> Select a block to be pasted, and select [Edit] ⇒ [Paste]. Select a block to be pasted, and press the [Ctrl] + [V] keys. |
| Delete ^{*2} | | <ul style="list-style-type: none"> Select an element to be deleted, and select [Edit] ⇒ [Delete]. Select an element to delete, and press the [Delete] key. |
| Connection line ^{*3} | To connect | Click a connection point, and drag it to a target connection point. |
| | To replace | Click a connection point of the replacement source while a connection line is selected, and drag and drop it to a connection point of the replacement target. |

*1 The following data, a label used in the following data, and a global label cannot be copied.

- Manufacturer-provided function block
- Tag FB
- Function

*2 The following data, a label used in the following data, and a global label cannot be deleted.

- Manufacturer-provided function block
- Tag FB

*3 In any of the following cases, data cannot be connected or the connection target cannot be replaced:

- A source (connection source) block is a manufacturer-provided function block
- An associated (connection target) block is a program block.
- The data is a tag FB or function.
- A circular reference occurs.

Correcting the layout

| Operation | Operating procedure |
|-----------------|---|
| Insert a row | Select a cell in a row to be inserted, then select [Edit] ⇒ [Layout] ⇒ [Insert Row] . A new row is inserted on the selected cell. |
| Delete a row | Select a cell in a row to be deleted, then select [Edit] ⇒ [Layout] ⇒ [Delete Row] . The row including the selected cell is deleted. |
| Insert a column | Select a cell in a column to be inserted, then select [Edit] ⇒ [Layout] ⇒ [Insert Column] . A new row is inserted on the left of the selected cell. |
| Delete a column | Select a cell in a column to be deleted, then select [Edit] ⇒ [Layout] ⇒ [Delete Column] . The column including the selected cell is deleted. |

Precautions

- The following menu cannot be used in a program configuration diagram:
[Edit] ⇒ [Undo]/[Redo]
- If the data displayed in a program configuration diagram is different from the actual data, such as when the data is edited in a program editor, the mode switches automatically from the edit mode to the display mode.

6.10 Checking a Program

This section explains the method for checking whether an error exists in a created program.

The following table shows the differences of check contents in a program check and a syntax check.

○: Checked, ×: Not checked

| Check point | Syntax check | Program check |
|--|--------------|---------------|
| Ladder block check (ladder program, FBD/LD program) | ○ | × |
| Program syntax check (ST program) | ○ | × |
| Use of undefined label check | ○ | × |
| Data type of argument check | ○ | × |
| Duplicated coils check | × | ○ |
| Use of out-of-range device check | × | ○ |
| Incorrect pointer check | × | ○ |
| Instructions, used in pairs, check (such as (FOR/NEXT, MC/MCR) | × | ○ |

Syntax check

This is for checking the validity of the program syntax.

This can be performed for ladder, ST, and FBD/LD programs.

Remote head modules do not support this check.

Operating procedure

■Checking all programs

Select [Convert] ⇒ [Check Syntax] ⇒ [ALL POU].

■Checking programs on activated program editors

Select [Convert] ⇒ [Check Syntax] ⇒ [Current POU].

When an error is found in the check result, the error message appears in the "Output" window. Take corrective actions according to the displayed contents.

When multiple worksheets exist, all programs in the POU are checked in this check.

Precautions

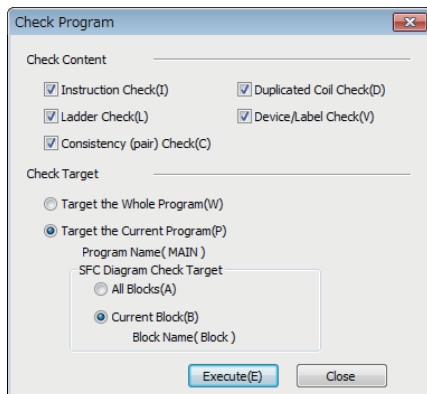
- After a syntax check is completed, the former operations cannot be undone or redone on a ladder editor.
- When a return element is used in an FBD/LD program, the local label may be changed to the unconverted state and the project may also be changed to the unsaved state.

Program check

This is for checking improper input and program inconsistency.
Remote head modules do not support this check.

Window

Select [Tool] ⇒ [Check Program].



When an error is found in the check result, the error message appears in the "Output" window. Take corrective actions according to the displayed contents.

Precautions

■When a macro type function block is used

When an error occurs in a program of a macro type function block, the cursor may jump to a location where the corresponding error does not exist even if the error message displayed in the "Output" window is double-clicked.

In that case, identify the location where the error has occurred by any of the following methods.

| No. | Method |
|-----|---|
| 1 | Search for the name of a device, label, or instruction given in the error message. (🔍 Page 460 SEARCHING FOR DATA) |
| 2 | <ol style="list-style-type: none"> ❶ Back up the project. ❷ Change the type of the function block to the subroutine type. (🔧 Page 507 Changing the type of a function block) ❸ Convert all programs. ❹ Double-click a displayed error message, and check the jump destination. <p>If an error does not occur after converting all programs, check a ladder where an input argument, output argument, or input/output argument of the macro type function block is used.</p> |

Target of duplicated coil check

■Instruction

The following instructions are checked as the target.

- RCPU and LHCPU: EGP, EGF, OUT, OUTH, SET, PLS, PLF, FF, DELTA, DELTAP, SFT, SFTP, MC, pointer, BLKMOV^{*1}, BLKMOVBP^{*1}, MOV^{*1}, MOVBP^{*1}, CMLB^{*1}, CMLBP^{*1}
- FX5CPU: OUT, OUTH, SET, PLS, PLF, FF, SFT, SFTP, MC, pointer, BLKMOV^{*1}, BLKMOVBP^{*1}, MOV^{*1}, MOVBP^{*1}, CMLB^{*1}, CMLBP^{*1}, OUTHS, UDCNTF

*1 Not checked when any of the following devices is used:

- Timer (T)
- Retentive timer (ST)
- Long timer (LT)
- Long retentive timer (LST)
- Counter (C)
- Long counter (LC)

■Device

The following devices are checked as the target.

For the available devices in a CPU module, refer to the user's manual of each module.

- RCPU and LHCPU

| Check range | Type | Device |
|--------------------|--|---|
| Check in a project | Device | M, SM, L, F, V, S, TR, X, Y, B, SB, DX, DY, D, SD, R, ZR, RD, W, SW, T(TC), T(TS), T(TN), C(CC), C(CS), C(CN), ST(STC/SC), ST(STS/SS), ST(STN/SN), LT(LTC), LT(LTS), LT(LTN), LC(LCC), LC(LCS), LC(LCN), LST(LSTC/LSC), LST(LSTS/LSS), LST(LSTN/LSN), P, I, BL, GLP |
| | Link direct device | J□\X, J□\Y, J□\B, J□\SB, J□\W, J□\SW |
| | Module access device | U□\G, U□\HG |
| | Safety device | SA\M, SA\SM, SA\X, SA\Y, SA\B, SA\D, SA\SD, SA\W, SA\T(TC), SA\T(TS), SA\T(TN), SA\C(CC), SA\C(CS), SA\C(CN), SA\ST(STC/SC), SA\ST(STS/SS), SA\ST(STN/SN) |
| | Step No./ Transition No. in an SFC program | BL□\S, BL□\TR |
| Check in file only | Device | #M, #V, #D, #T(TC), #T(TS), #T(TN), #C(CC), #C(CS), #C(CN), #ST(STC/SC), #ST(STS/SS), #ST(STN/SN), #LT(LTC), #LT(LTS), #LT(LTN), #LC(LCC), #LC(LCS), #LC(LCN), #LST(LSTC/LSC), #LST(LSTS/LSS), #LST(LSTN/LSN), #P, #LLP |
| | Safety device | SA\#M, SA\#D, SA\#T(TC), SA\#T(TS), SA\#T(TN), SA\#C(CC), SA\#C(CS), SA\#C(CN), SA\#ST(STC/SC), SA\#ST(STS/SS), SA\#ST(STN/SN) |

- FX5CPU

| Check range | Type | Device |
|--------------------|--|---|
| Check in a project | Device | M, SM, L, F, S, X, Y, B, SB, DX, DY, D, SD, R, W, SW, T(TC), T(TS), T(TN), C(CC), C(CS), C(CN), ST(STC/SC), ST(STS/SS), ST(STN/SN), LC(LCC), LC(LCS), LC(LCN), P, I, BL |
| | Module access device | U□\G |
| | Step No./ Transition No. in an SFC program | BL□\S |

■Label

The following labels are checked as the target.

- Local label
- Global label

The devices assigned to labels are also checked.

Precautions

Labels used in the following programs are excluded from the check target.

- Inline structured text program
- Function
- Function block

A selection function (SEL) used in a ladder editor and FBD/LD editor is a duplicated coil even if inconsistency does not occur.

6.11 Converting Programs

This section explains the method for converting a created program into a code that can be executed.

A data name displayed in red in the navigation window indicates that the data is unconverted. The data is required to be converted.

A data name displayed in light blue in the navigation window indicates that the data is unused. The data is not converted.

The name of unused data that is not converted is displayed in red. After the data is converted successfully, it will be displayed in light blue. If a conversion error occurs, all the unused data will be displayed in red.

Converting any or all programs

The program in a project can be converted and a label can be assigned. The program is also checked at conversion.

The differences in operation between "Convert" and "Rebuild All" are shown below:

| Item | Conversion target | Assignment of labels | Program check |
|-----------------------|---|--|---|
| Convert ^{*1} | Newly added or changed program and label | The memory is assigned to the newly added and changed label. | Whether to perform a program check can be specified in "Basic Setting" by selecting [Tool] ⇒ [Options] ⇒ "Convert." |
| Rebuild All | All programs and labels in a project (regardless if changed or not) | Retain: Converts a program without changing the memory assigned to a defined label ^{*2} . A newly added label and a label, of which the label name, data type, class, and initial value etc. have been changed, are reassigned again. Reassignment: Converts a program with assigning the memory to all labels. The memory usage can be optimized. | Whether to perform a program check can be specified in the "Rebuild All" screen. ^{*3} |

*1 Remote head modules do not support it.

*2 A label of which the label name, data type, class, and initial value etc. have not been changed after reassigning the memory in previous conversion of any or all programs.

*3 The instruction check cannot be performed if "No" is selected for the following option or if the project is for an FX5CPU:
[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Use Phase Processing Instructions"

Operating procedure

1. Select [Convert] ⇒ [Convert] ^{*1} (🔧) / [Rebuild All] (🔧).
2. To convert all programs, specify each item for "Label Assignment" and "Check Program"^{*2} in the "Rebuild All" screen, and click the [OK] button.

*1 When "Yes" is selected in the following option setting, the online program change is performed instead.

[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Online Program Change" ⇒ "Operational Setting" ⇒ "Execute Online Program Change in Converting"




*2 If there is no program, the check is not performed even if the check box for "Check Program" is selected.

Point



The unconverted data can be checked. Select and right-click a global label, POU, or program file in the navigation window, then select [Expanded/Collapse Tree] ⇒ [Open Unconverted Data] from the shortcut menu.

■Operations that requires a conversion for all programs

When one of the following operation is performed, converting all programs is required.



- Changing the module type/operation mode
- Changing the system parameter (Fixed Scan Communication Area Setting)
- Changing CPU parameters (File Register Setting, Device/Label Memory Area Setting, Index Register Setting, Refresh Memory Setting, Pointer Setting, Program Setting, FB/FUN File Setting, Refresh Setting (At I45 Exe))
- Changing CPU parameters (Program Capacity Setting, To Use or Not to Use SFC) of an FX5CPU
- Changing the option setting ("Other Editor" ⇒ "Label Editor Common" ⇒ "Data Type Setting," "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting")
- Adding a label, of which the data type is the function block, to a local label of converted function block
- Changing the type of a function block in the "Properties" screen of an FB file ( Page 507 Changing the type of a function block)
- Importing a ladder program from a CSV file
- Changing reserved area capacities in the "Properties" screen of a function block. ( Page 508 Setting reserved area capacities)
- Adding a label which exceeds the reserved area capacity^{*1} to a local label of converted function block
- Changing reserved area capacities in the "Properties" screen of a structure definition ( Page 252 Setting reserved area capacities)
- Adding a structure member which exceeds the reserved area capacity^{*1} to a converted structure definition
- Changing the tag FB setting (tag FB type, tag type, declaration position) in projects for an RnPCPU and an RnPSFCPU
- Changing a security version of a project and project password
- Changing the security key setting (for a project whose security version is '2' only)

*1 For details, refer to the following:

-  MELSEC iQ-R Programming Manual (Program Design)
-  MELSEC iQ-F FX5 Programming Manual (Program Design)

Considerations for conversion

For details on the conversion of a function block and function, refer to the following:

-  Page 508 Converting function blocks
-  Page 526 Converting functions

Considerations for conversion or conversion for all programs

■When canceling a conversion

A conversion is canceled for each program file. Even though the [Cancel] button is clicked during a conversion, it will not be canceled until the conversion for one program file is completed.

Note that a large-scale program file with multiple FBs/FUNs may require a longer time to cancel the conversion.

■When creating a sequence program including multiple instructions

'LD SM400' may be added in the beginning of the program in order to execute the program.

■When no program is included in a project

Program check is not performed.

■When an inline structured text is used in a ladder program

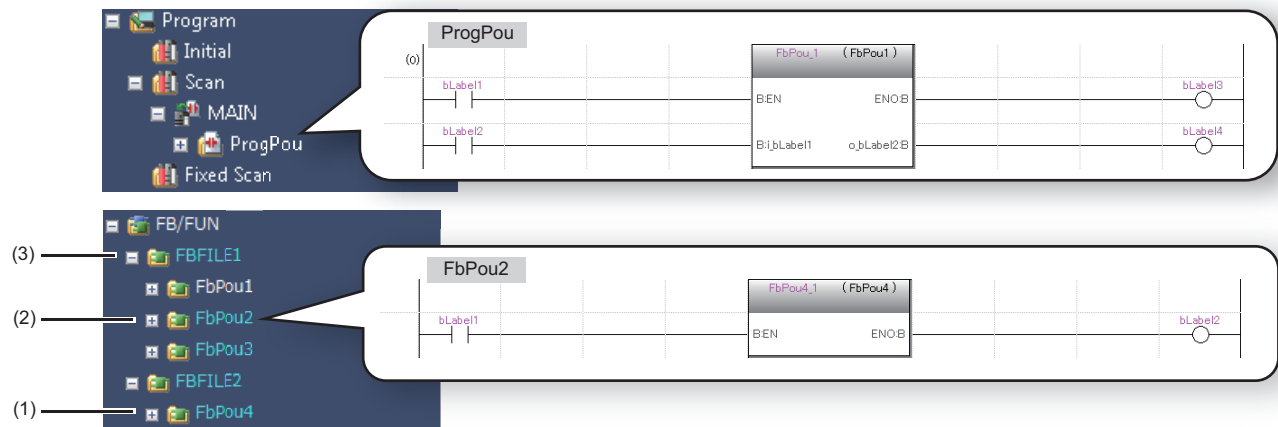
When an inline structured text box is placed in a wrapping destination ladder, a jump destination of an error message may be the top of a ladder block if a conversion error occurs in an inline structured text. Change the layout of the inline structured text box, or perform a conversion after change the number of displayed contacts so that the inline structured text box is not placed in a wrapping destination ladder.

■When the warning for the error code '0x120C2010' or '0x120C2011' is displayed

A warning message appears when converting a program containing an unused POU in which any of the following data is used.

- Function block
- Function
- Standard function block
- Structure

An example using a function block is explained below.



When writing the program (3) to a CPU module while a warning message is displayed, the POU (2) is written but the data (1) is not.

Therefore, an error will occur when reading the POU (2) from the CPU module to a new project in order to use it in a program and converting the created program because the data (1) is not included.

To avoid this error, take the following measures before writing the program (3) to the CPU module.

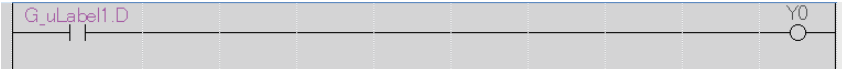
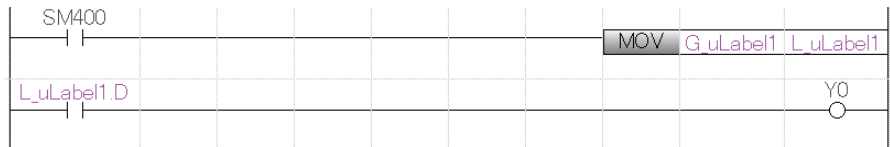
| Data | Measure |
|----------------------------|---|
| Function block Function | Move a function block or function into an FB file or FUN file including a converted POU and convert the program again. <div></div> |
| Standard function block | Use a standard function block in a converted program and convert the program again. |
| Structure | Register one or more structure type labels into a label editor in which the assigned label is included and convert the program including the label again. |

■When an error code '0x120110A2' or '0x120110A4' is displayed

A conversion error occurs when either of the following global labels is bit-specified or digit-specified in a program.

- Global label to which a digit-specified bit device is assigned (word type)
- Global label to which a bit-specified word device is assigned (bit type array)

Change the program as follows.

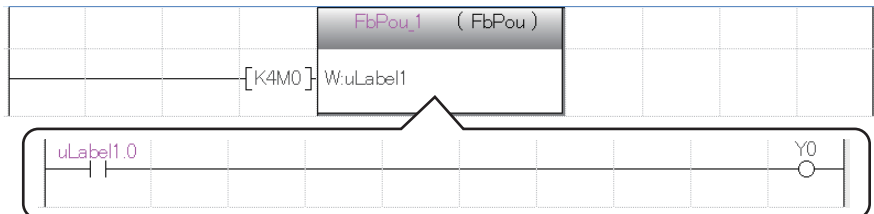
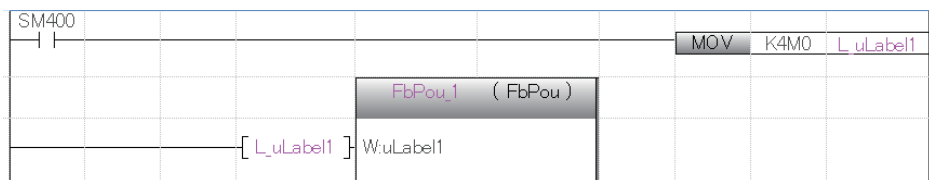
| Changing method | Program example | | | | | | | | |
|--|--|----------------|-----------------------|-------|-----------------------|-----------|-------------------------------------|----------------|--------|
| <div>❶ Transfer the current value of the global label to another device or label.</div> <div>❷ Specify a bit or digit for the device or label.</div> | <div>Example: Global label to which a digit-specified bit device is assigned (G_uLabel1)</div> <table><tr><th>Label Name</th><th>Data Type</th><th>Class</th><th>Assign (Device/Label)</th></tr><tr><td>G_uLabel1</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>... VAR_GLOBAL</td><td>▼ K4X0</td></tr></table> <div>An error occurs when converting a program where 'G_uLabel1' is bit-specified.</div> <div></div> <div>This program can be converted properly by changing it to the program where another label that the value of 'G_uLabel1' is transferred to (L_uLabel1) is bit-specified.</div> <div></div> | Label Name | Data Type | Class | Assign (Device/Label) | G_uLabel1 | Word [Unsigned]/Bit String [16-bit] | ... VAR_GLOBAL | ▼ K4X0 |
| Label Name | Data Type | Class | Assign (Device/Label) | | | | | | |
| G_uLabel1 | Word [Unsigned]/Bit String [16-bit] | ... VAR_GLOBAL | ▼ K4X0 | | | | | | |

■When an error code '0x120110A3' or '0x120110A5' is displayed

A conversion error occurs when either of the following Input/output labels is bit-specified or digit-specified in a program of a macro type function block.

- Input/output label using a digit-specified bit device as its argument (word type)
- Input/output label using a global label to which a bit-specified word device is assigned as its argument (bit type array)

Change the program as follows.

| Changing method | Program example |
|---|--|
| <p>❶ Transfer the current value of the digit-specified bit device or the global label to another device or label.</p> <p>❷ Use the device or label as the argument of an input/output label of a macro type function block.</p> | <p>Example: Input/output label using the digit-specified bit device (K4M0) as its argument (uLabel1)</p>  <p>An error occurs when converting a program using 'K4M0' as the argument of 'uLabel1.'</p> <p>This program can be converted properly by changing it to the program using another label that the value of 'K4M0' is transferred to (L_uLabel1) as the argument.</p>  |

Considerations after converting any or all programs (Retain)

A newly added label and a label of which the data type etc. have been changed are reassigned again.


The current (initial) label value can be reassigned by any of the following methods.

- Register the label to a watch window, and set the current value.
- Set the initial value on a label editor.*1

*1 FX5CPU does not support the setting for initial values of labels.

When the current value of a local label needs to be retained, perform the online program change.

For details, refer to the following:


 MELSEC iQ-R CPU Module User's Manual (Application)

Considerations after converting all programs (Reassignment)

When all programs are converted (reassigned), the label memory area is reassigned to all POU's. If all the converted programs are written to the CPU module and RUN as they are, the programs may be processed with the device values set before the program change.

After converting all programs, initialize the labels by the following procedure.

Operating procedure

1. Switch the CPU module to STOP.
2. Select "Device/Label Memory" in the "CPU Memory Operation" screen displayed by selecting [Online] ⇒ [CPU Memory Operation] to clear the values.
3. Select [Online] ⇒ [Write to PLC] () to write the changed program files. When the initial values of labels used in the program are set, write the initial label value file as well.
4. Reset the CPU module.

It can also be reset by selecting [Online] ⇒ [Remote Operation].

The labels are set to '0' or initialized with the values set in the initial label value file.

Converting a program file with the process control extension enabled



Operations of a program with the process control extension enabled can be set in the following option setting.
[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting"

■Adding/changing the program processing while the system is operating

For process control, when changing/adding the program processing while the system is operating, the current value of a registered label needs to be retained and the current value of a newly added/changed label needs to be initialized to keep the system operating.

However, labels newly added/changed after writing a programmable controller only cannot be initialized by converting any or all programs when writing them to the programmable controller next time.

To initialize only the current value of a newly added/changed label, perform the online program change.

In addition, set the following option so as not to convert (retain) any or all program after creating a new project.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Conversion Operation" ⇒ "Enable Conversion"

■System header and system footer

When creating a program file with the process control extension enabled, the system data for the process control extension is generated at conversion.

A program file of the scan execution type with the process control extension enabled, the system header POU (M+PHEADER) and system footer POU (M+PFOOTER) are created in the program file after conversion.

At conversion, the execution order of the system header is set to the start of the program file. As for the system footer, it is set to the end of the program file. (The order can be checked in the program file setting.)

When the process control extension is disabled or the execution type other than scan is set, the system header and system footer will be deleted from the program file at conversion.

■Increase of the number of steps used

The number of steps used increases in a program with the process control extension enabled.

The following table shows the number of extra steps used.

| Program execution type | Program block name | Number of extra steps used |
|------------------------|--------------------|----------------------------|
| Scan | M+PHEADER | Approx. 1400 steps |
| | M+PFOOTER | Approx. 30 steps |
| | Others | Approx. 10 steps |
| Fixed scan | All | Approx. 60 steps |

■Device memory

When a program with the process control extension enabled exists and "Use Common File Register in All Programs" is set for "File Register Setting" of "CPU Parameter," the device memory is created at conversion.

In addition, the data in the range set in the following option is overwritten to the device memory.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource"

Converting a project with the process control extension enabled

Note the following for projects used for CPU modules in a redundant system configuration with the process control extension enabled.

■Tracking setting

The following parameters are automatically set when converting a program.

| Parameter | Setting content |
|--|---|
| • "CPU Parameter" ⇒ "Redundant System Settings" ⇒ "Tracking Setting" ⇒ "Tracking Device/Label Setting" | The settings in "Detail Setting" are configured. |
| • "CPU Parameter" ⇒ "Redundant System Settings" ⇒ "Tracking Setting" ⇒ "Tracking Device/Label Setting" ⇒ "Device/Label Detailed Setting" | The range of a file register that was set in the following option is set for the trucking block No.64 ^{*1} . • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource" ⇒ "File Register: ZR" |

*1 A trucking block number that was set in the following option:

[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Redundant Setting" ⇒ "Tracking Block No."

The following device data must be set manually since it is not automatically set in "Device/Label Detailed Setting" of "CPU Parameter."

- Device data other than file registers used for FBD/LD programs for process control
- Device data used for programs other than FBD/LD programs for process control

When setting the device data described above, set them to a trucking block number other than No.64 in "Device/Label Detailed Setting" of "CPU Parameter"

Precautions

The contents of the tracking block No.64 in "Device/Label Detailed Setting" of "CPU Parameter" cannot be changed manually since they are automatically set when converting a program.

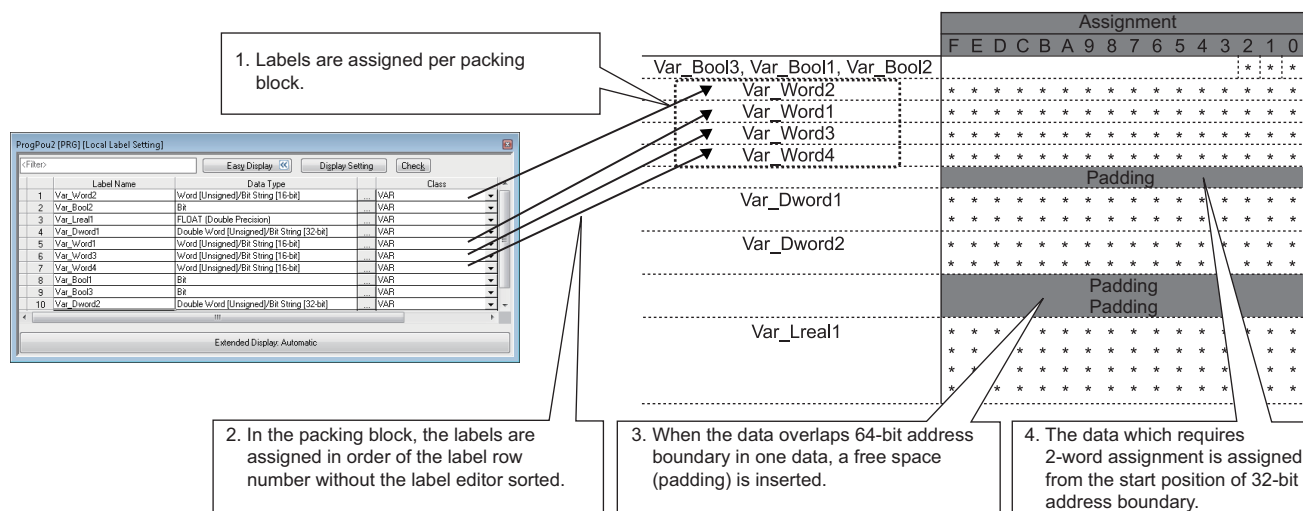
SD1670.F automatically turns ON at scanning while a CPU module is running in the backup mode since the set contents of the tracking block No.64 is transferred (tracked); do not turn SD1670.F OFF during the scan.

When reading parameters from a CPU module after converting a program, if the parameter is overwritten with a different content from the one that was automatically set as above, convert the program again.

Memory assignment of labels (RCPU/LHCPU/FX5CPU)

When converting/converting all programs, the labels declared in a label editor are assigned to the memory in a packing block (which is classified as type and data type, and set them in consecutive order of line numbers) unit. Since it is assigned in POU units, the start position of POU will be 64-bit address boundary.

Ex.



The types of packing blocks and assignment order is shown below.

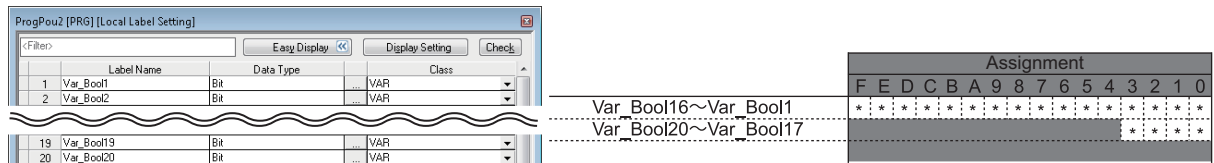
They are arranged in ascending order due to minimize the useless space.

| Assignment order | Packing block | Data type | Remarks |
|------------------|--------------------------|--|---|
| 1 | Bit | Bit | ☞ Page 440 Assignment of bit type |
| 2 | Word | Word [Unsigned]/Bit String [16-bit] Word [Signed] | — |
| 3 | String | String | Padding is not inserted because a packing block is assigned per one word unit, though the assignment amount differs depending on the number of character strings. |
| 4 | String [Unicode] | String [Unicode] | |
| 5 | Double Word | Double Word [Unsigned]/Bit String [32-bit] Double Word [Signed] | — |
| 6 | Time | Time | — |
| 7 | FLOAT [Single Precision] | FLOAT [Single Precision] | — |
| 8 | Timer | Timer | ☞ Page 441 Assignment of timer/retentive timer/counter |
| 9 | Retentive Timer | Retentive Timer | |
| 10 | Counter | Counter | |
| 11 | FLOAT [Double Precision] | FLOAT [Double Precision] | — |
| 12 | Long Timer | Long Timer | ☞ Page 441 Assignment of timer/retentive timer/counter |
| 13 | Long Retentive Timer | Long Retentive Timer | |
| 14 | Long Counter | Long Counter | |
| 15 | Array | All | ☞ Page 440 Assignment of array |
| 16 | Structure/FB instance | All | ☞ Page 440 Assignment of structure |

■Assignment of bit type

If the number of bit type labels exceeds 16, the labels will be assigned to the next memory area consecutively.
For FB instances, the area of EN/ENO is assigned to each head of the FB instances.

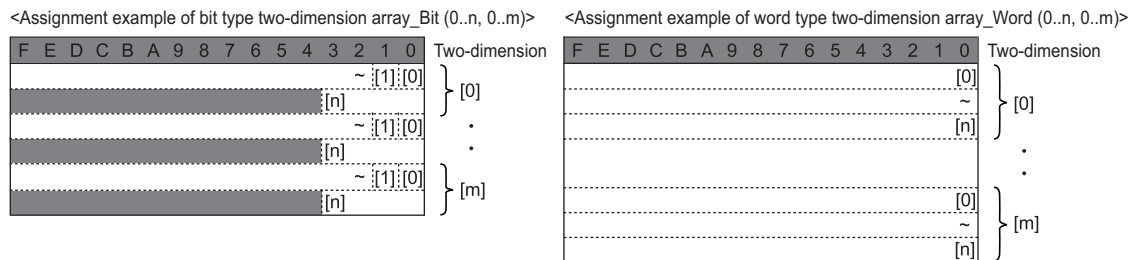
Ex.



■Assignment of array

For a bit type array, the start address of the array is assigned from 0th bit, and continuous bits are assigned in word units for the number of elements of the last dimension. For one-dimension and two-dimension, areas are assigned continuously for the number of elements of the dimension in units of the word assigned to the previous dimension.
For an array other than bit type, areas are assigned continuously for the number of elements of the last dimension to the memory capacity of the data type. For one-dimension and two-dimension, areas are assigned continuously for the number of elements of the dimension in units of the word assigned to the previous dimension. A padding is not inserted between the array elements.

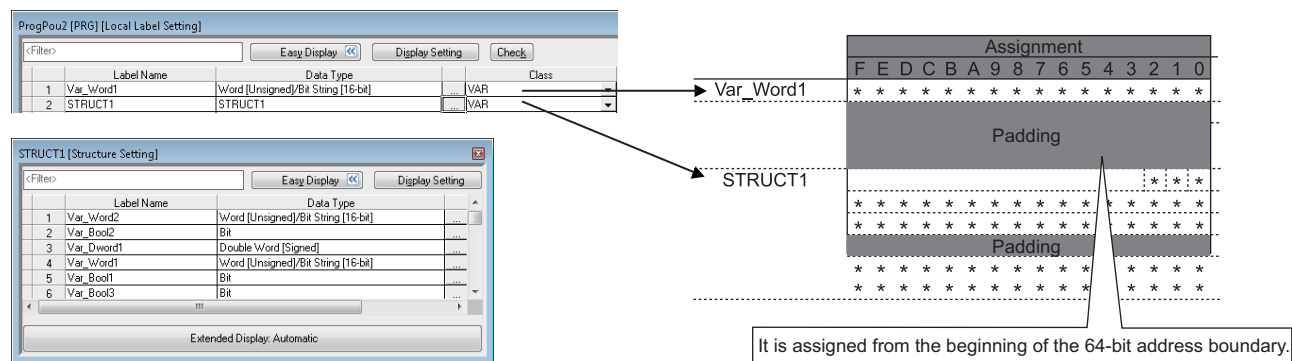
Ex.



■Assignment of structure

A member of structure is assigned according to the assignment order of packing blocks. When a structure is declared in the member of structure, it will be assigned in a packing block according to the order noted previously. It will be assigned from the start position of 64-bit address boundary.

Ex.



■ Assignment of timer/retentive timer/counter

● Timer, retentive timer, counter

The data types of the timer, retentive timer and counter are structures that have a contact, coil, and current value.

The following table shows the member configuration of each data type.

| Type | Member | Data type | Description |
|-----------------|--------|-------------------------------------|---|
| Timer | S | Bit type | The operation is the same as the contact (TS) of the timer device. |
| | C | Bit type | The operation is the same as the coil (TC) of the timer device. |
| | N | Word [Unsigned]/Bit String [16-bit] | The operation is the same as the current value (TN) of the timer device. |
| Retentive timer | S | Bit type | The operation is the same as the contact (STS) of the retentive timer device. |
| | C | Bit type | The operation is the same as the coil (STC) of the retentive timer device. |
| | N | Word [Unsigned]/Bit String [16-bit] | The operation is the same as the current value (STN) of the retentive timer device. |
| Counter | S | Bit type | The operation is the same as the contact (CS) of the counter device. |
| | C | Bit type | The operation is the same as the coil (CC) of the counter device. |
| | N | Word [Unsigned]/Bit String [16-bit] | The operation is the same as the current value (CN) of the counter device. |

Each of timer, retentive timer, and counter requires 2 words.



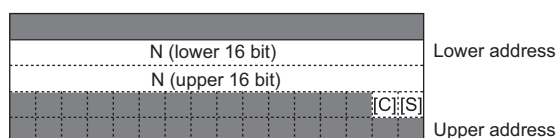
● Long timer, long retentive timer, long counter

The data types of the long timer, long retentive timer and long counter are structures that have a contact, coil, and current value.

The following table shows the member configuration of each data type.

| Type | Member | Data type | Description |
|----------------------|--------|--|--|
| Long timer | S | Bit type | The operation is the same as the contact (LTS) of the timer device. |
| | C | Bit type | The operation is the same as the coil (LTC) of the timer device. |
| | N | Double Word [Unsigned]/Bit String [32-bit] | The operation is the same as the current value (LTN) of the timer device. |
| Long retentive timer | S | Bit type | The operation is the same as the contact (LSTS) of the retentive timer device. |
| | C | Bit type | The operation is the same as the coil (LSTC) of the retentive timer device. |
| | N | Double Word [Unsigned]/Bit String [32-bit] | The operation is the same as the current value (LSTN) of the retentive timer device. |
| Long counter | S | Bit type | The operation is the same as the contact (LCS) of the counter device. |
| | C | Bit type | The operation is the same as the coil (LCC) of the counter device. |
| | N | Double Word [Unsigned]/Bit String [32-bit] | The operation is the same as the current value (LCN) of the counter device. |

Each of long timer, long retentive timer, and long counter requires 4 words.



■ Assignment of FB instances

For details of the FB instances, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Converting character codes

■ Considerations for using an instruction not supporting Unicode

To set a string constant or string type label as an argument of an instruction not supporting Unicode, check that the language set in the following option matches with that for the initial values of the string constant or string type label before converting a program.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Language for Instruction Conversion of Character String Operation and Label Initial Value"

Unify the language used in a project to set a string constant or string type label as an argument of an instruction.

The data type of an instruction not supporting Unicode is "string," "ANYSTRING_SINGLE," or

"ANYSTRING_SINGLE_ARRAY" mentioned in the following manual.

📖 MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

📖 MELSEC iQ-R Programming Manual (Module Dedicated Instructions)

Performing the online program change simultaneously at conversion

For the operation method for performing the online program change simultaneously at conversion, refer to the following:

📖 Page 617 Writing Programs While a CPU Module is in the RUN State

Checking for errors and warnings

When the program is converted, the target programs and label settings are checked and the result is displayed in the "Output" window.

The corresponding error location can be referred in the "Output" window.

Operating procedure

1. Double-click the error/warning message displayed in the "Output" window.
2. Check the corresponding error location and modify the error as instructed by the error/warning message.

Considerations

The cursor may jump to a location where the corresponding error does not exist even if the error message displayed in the "Output" window is double-clicked. The following shows corrective actions for this case.

■When a program includes an unconverted state ladder

Identify the location where the error has occurred by following the procedure below.

1. Convert all the programs.
2. Double-click a displayed error message, and check the jump destination.

■When a macro type function block is used

Identify the location where the error has occurred by either of the following methods.

| No. | Method |
|-----|--|
| 1 | Search for the name of a device, label, or instruction given in the error message. (🔍 Page 460 SEARCHING FOR DATA) |
| 2 | <div>❶ Back up the project.</div> <div>❷ Change the type of the function block to the subroutine type. (🔍 Page 507 Changing the type of a function block)</div> <div>❸ Convert all programs.</div> <div>❹ Double-click a displayed error message, and check the jump destination.</div> <div>If an error does not occur after converting all programs, check a ladder where an input argument, output argument, or input/output argument of the macro type function block is used.</div> |

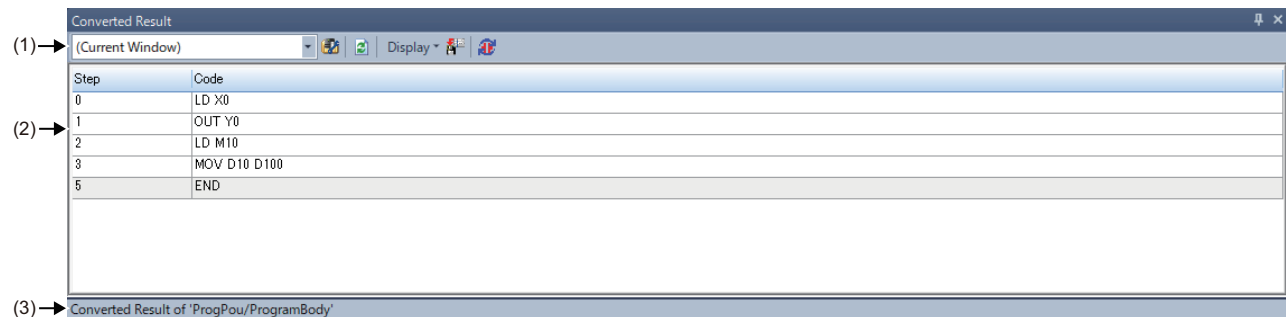
Displaying a converted result

Converted programs can be listed in the "Converted Result" window.








In addition, the corresponding location in the program can be referred from the "Converted Result" window.

Window

Select [View] ⇒ [Docking Window] ⇒ [Converted Result]().



Displayed items

| Item | | Description |
|----------------------|--|--|
| (1) Toolbar | (Current Window) | Specify a program block, function block, or function whose converted result is to be displayed. ( Page 444 Displaying a converted result) |
| | Enter POU Name or Program Name | |
| |  Select Converted Result | Click this to specify a program block, function block, or function whose converted result is to be displayed from the tree of the program data. |
| |  Display Target | |
| |  Update | Click this to display/update the converted result. |
| | View | Switch the contents displayed in the converted result. <ul style="list-style-type: none">• Hide Converted Result Inserted by System^{*1}• Display all Lines |
| (2) Converted result |  Export to File | Click this to export the converted result to a text file. ( Page 445 Exporting a converted result) |
| |  Synchronize | Click this to synchronize the cursor position in a program editor with that in the "Converted Result" window. The operations during the synchronization are as follows: <ul style="list-style-type: none">• Any element is selected in a program editor: The cursor automatically moves to the corresponding row in the "Converted Result" window.• Any row is selected in the converted result list: The cursor automatically moves to the corresponding data in a program editor. |
| (3) Status bar | | The converted result information is displayed. |

^{*1} When the checkbox of this items is selected, the following items are omitted in display:

LD TRUE (except for a ladder program), LD TMP, OUT TMP, start/end of an FB/FUN, definition information of an FB/FUN

^{*2} For an SFC program, the step number is not displayed.

Operating procedure

■Displaying a converted result

1. Enter the name of a program block, function block, function whose converted result is to be displayed in the input field on the tool bar (1).


The following table shows the input formats.

| Display target | Input format | Example |
|---|---|----------------------|
| Program block | Program block name | ProgPou |
| Program body | Program block name/Program body name | ProgPou/Program body |
| Inline structured text (FBD/LD program) | Program block name/Data name of an inline structured text element | ProgPou/STB_1 |
| Zoom | Program block name/Zoom name | Block/Action0 |
| Function block | Function block name | FbPou |
| FB program | Function block name/FB program name | FbPou/Program body |


| Display target | Input format | Example |
|----------------|--------------------------------|---------------------|
| Function | Function name | FunPou |
| FUN program | Function name/FUN program name | FunPou/Program body |

2. Click  (Update) on the tool bar (1).

Point

- The converted result can also be displayed by using the following menu while a program editor is active:
 - [Convert] ⇒ [Converted Result]
- The cell can be jumped to the corresponding data in a program editor by selecting a row in the displayed converted result, then performing either of the following operations:
 - Double-click the row.
 - Press the .

Exporting a converted result

1. Click  (Export to File) on the tool bar (1).
2. Enter a file name to export in the "Export to File" screen.
3. Specify "Text (*.txt)" for the file type, and click the [Save] button.

Point

The output contents follow the setting of the [Display] button on the tool bar (1).

6

Precautions

- In any of the following cases, the cursor does not move even when synchronization is enabled:
 - A contact/coil that is connected to a function is selected in a ladder editor.
 - A program element to which a value is to be substituted is selected in an ST editor.
 - A program component to which a value is to be substituted is selected in an FBD/LD editor.
- When the setting of the following option is changed or GX Works3 is upgraded, the converted result may be changed even when the program is not edited:

[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps"

6.12 Calculating Memory Size

This section shows how to calculate offline a memory size required when writing data in a project to a CPU module.
Remote head modules do not support this function.

Window

Select [Tool] ⇒ [Confirm Memory Size (Offline)].

Ex.
R08CPU

| Module Name/Data Name | Detail | Title | Last Change | Size (Byte) | Program (Step) | Label (Word) | Latch Label (Word) |
|--------------------------------|--------|-------|---------------------|----------------|----------------|--------------|--------------------|
| Untitled Project | | | | | | | |
| Parameter | | | | | | | |
| System Parameter/CPU Parameter | | | 2019/09/04 16:42:26 | Not Calculated | | | |
| Module Parameter | | | 2019/09/04 16:42:26 | Not Calculated | | | |
| Memory Card Parameter | | | 2019/09/04 16:42:26 | Not Calculated | | | |
| Remote Password | | | 2019/09/04 16:42:26 | Not Calculated | | | |
| Global Label | | | | | | | |
| Global Label Setting | | | 2019/09/04 16:42:27 | Not Calculated | | | |
| Program | Detail | | | | | | |
| MAIN | | | 2019/09/04 16:42:28 | Not Calculated | | | |

Operating procedure


1. Select a version from the pull-down list of "CPU Firmware Version."^{*1}
2. Select "Byte" or "Step" from the pull-down list of "Size Display Unit."
3. When the data to be written to an SD memory card is included, select the corresponding SD memory card from the pull-down list of "Memory Card Type."
4. Select the file to be written, then click the [Calculate] button.

^{*1} A version can be displayed in projects for RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU), RnENCPUs, RnPCPUs, and RnSFCPUs.

The setting methods for the details of a target file and each data are the same as those in the "Online Data Operation" screen.
Refer to the following:

Page 597 WRITING/READING DATA TO CPU MODULE

Depending on the CPU parameter setting, the used capacity may be displayed after calculation even if any file is not selected.
(Example: File Register Setting)

- The items displayed in "Memory Capacity" differ depending on a CPU module.
- When using a project for an FX5CPU, the capacity of an SD card is displayed by selecting the model name of the SD memory card from the pull-down list of "Memory Card Type."
- The firmware version of a CPU module can be checked in the "Product Information List" screen which can be displayed from the system monitor. ( Page 729 Check of the module firmware version and product information)

Precautions

- Capacity which is displayed in the "Label" column and "Latch label" column, and is enclosed with () is included in the one for the program or global labels using the data; therefore, the capacity enclosed with () is not included in the one for labels and latch labels.
- When writing data by using the [Online Program Change] menu, the size of global label assignment information displayed in the "Confirm Memory Size (Offline)" screen may differ from the actual size of data to be written to a CPU module.

7 SETTING DEVICE MEMORY

This chapter explains the setting methods for the device memory.

7.1 Device Memory

The device memory in GX Works3 is data to read/write values from/to the device memory in a CPU module.

By reading device memory, its state in a CPU module can be checked, and the device memory can be used for offline debugging as well.

In addition, the current values of device memory in a CPU module can be changed in a batch by writing the device memory to a CPU module.

Applicable devices

For the devices that can be set in a device memory editor and their input method, refer to the following:

 Page 929 Applicable Devices in GX Works3

Difference between global devices and local devices

A device memory is not distinguished between a global device or local device.

Depending on the name of a device memory, it is classified into the following two kinds of devices when writing it to a CPU module.

- Device memory with a different name from that of the program file: Global device
- Device memory with a same name as that of the program file: Local device

FX5CPUs do not support local devices.

Considerations when the process control extension is enabled

Do not change the value of a device memory in the range set for the system resource in the following option.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource"

7.2 Configuration of a Device Memory Editor

This section explains the screen configuration of a device memory editor.

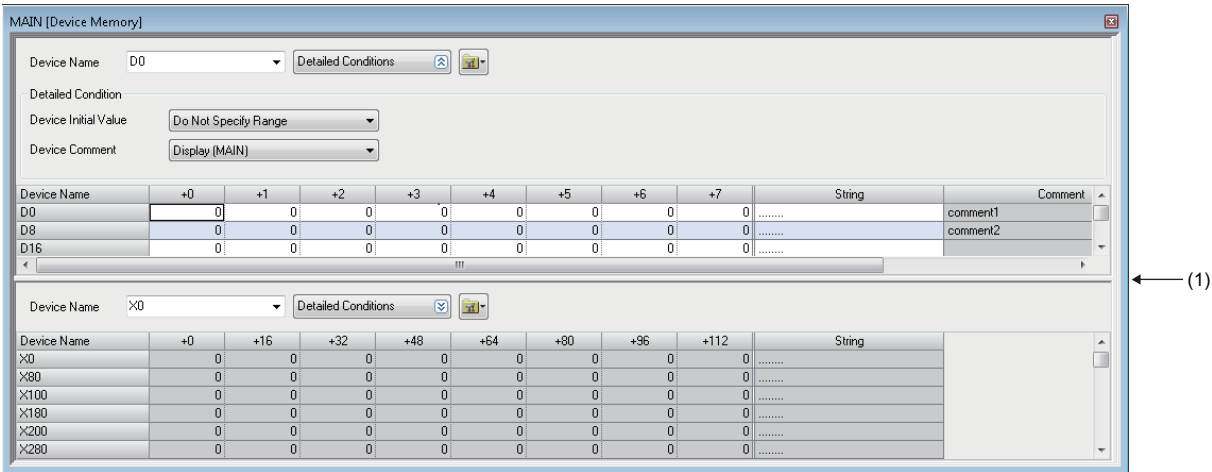
Window

Select "Device" ⇒ "Device Memory" ⇒ "(data name)" in the navigation window.

■Toolbar




■Device memory editor




(1): Splitter bar

A device memory editor can horizontally or vertically be split into two screens by using any of the following operations.

- Select [Window] ⇒ [Split]. (Horizontal split only)
- Right-click on the screen, and select [Split] from the short-cut menu ⇒ [Vertical Split]/[Horizontal Split]
- Click , and select [Split] ⇒ [Vertical Split]/[Horizontal Split]

By selecting "Specify Range" from the pull-down list of "Device Initial Value," only the initial device values in the specified range can be displayed.




Fonts can be changed. ( Page 82 Checking and Changing Colors and Fonts)

Setting the display format

Set the display format (Display Unit Format, Data Display Format, String Display Format, Value, Bit Order, Switch No. of Points) of the device value being displayed.

Operating procedure

1. Select [View] ⇒ [Display Format Detailed Setting] ().
2. Set each item in the "Display Format" screen and click the [OK] button.

The setting can also be performed in the toolbar.



When displaying a device value in binary, set the following:

- [View] ⇒ [Display Format Detailed Setting]() ⇒ "Display Unit Format" ⇒ "Bit and Word"

7.3 Setting Device Memory

This section explains the setting method of devices and device values.

Precautions

- If a deletion is executed after selecting a cell, the device value is cleared to '0.'
- The entering method by prefixing '#' to a device name to regard it as a local device is not supported.
Select global labels or local labels when reading the device memory from a CPU module.


Setting a value for each point

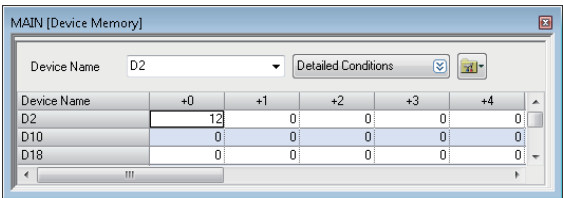
Set a device and device value for each point.

Ex.

Set the following values in a word multi-point format.
Device: D2, Device value: 12

Operating procedure

1. Set the display format. ( Page 449 Setting the display format)
2. Enter 'D2' in "Device Name."
3. Enter '12' to the device 'D2.'



Copying and pasting

When copying and pasting a value in a device memory editor, the value being displayed is copied and pasted as a tab-delimited character string.

A line feed code is inserted according to the column width displayed on the device memory.

For character strings other than numerical values (decimal, hexadecimal, and real number), "0" is pasted.

When pasting a value to Excel, select "Text" on the [Number] tab of "Format Cells" in Excel to display a copied character string as is.

Point

When the display unit format is bit, the device value can be changed by double-clicking a cell.

Setting values in batch



Set the same value to consecutive devices.

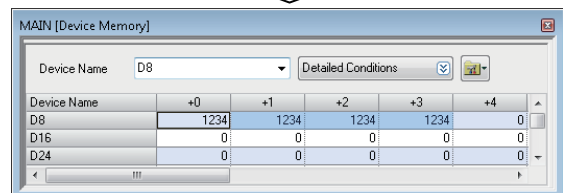
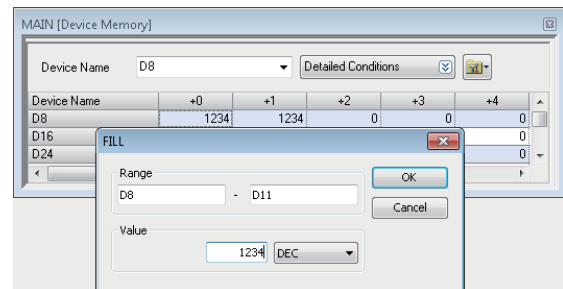
Ex.

Set the following values in a word multi-point format.

Device: D8 to D11, Device value: 1234

Operating procedure

1. Set the display format. ( Page 449 Setting the display format)
2. Enter 'D8' to "Device Name," and select the range of the device value to be set.
3. Select [Edit] ⇒ [FILL] ().
4. Set each item in the "FILL" screen and click the [OK] button.



Setting character strings

Set a character string to a device.

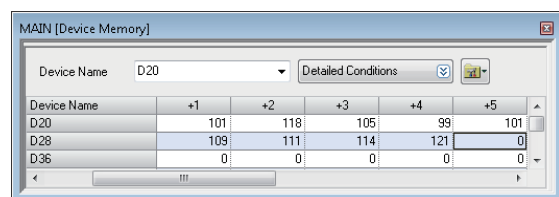
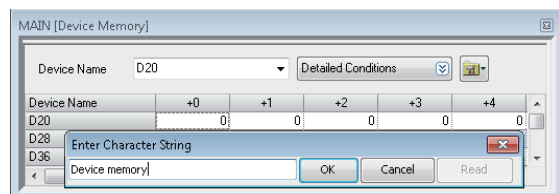
Ex.

Set the following values in a word multi-point format.

Device: D20, Character string: Device memory

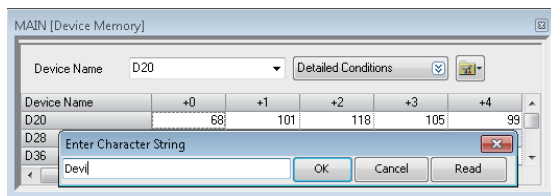
Operating procedure

1. Set the display format. (☞ Page 449 Setting the display format)
2. Enter 'D20' to "Device Name," and select [Edit] ⇒ [Enter Character String].
3. Enter a character string in the "Enter Character String" screen, and click the [OK] button.



Point

- Character string can be entered to "String" column directly.
- Click the [Read] button in the "Enter Character String" screen to read the set device values (string) one by one.



Precautions

For device memory, use characters in the Unicode Basic Multilingual Plane.

If a character outside the Unicode Basic Multilingual Plane is specified, it may not be displayed properly in the program.

Clearing whole memory of device memory

Clear the data set to device memory data to '0' in batch in the project.

Operating procedure

■Deleting all data in the device memory data

Select [Edit] ⇒ [Clear All (All Devices)].

■Deleting the devices displayed in a device memory editor

Select [Edit] ⇒ [Clear All (Displayed Devices)].

Linkage with initial device values

The values in the device memory can be registered as the initial values of devices. In addition, the initial device values can also be imported for values in the device memory.

Initial device value data to register should be created in advance.

Remote head modules do not support this linkage.

Operating procedure

1. Click the [Detailed Conditions] button.
2. Select "Specify Range" in the detailed conditions of "Device Initial Value."
3. Select [Edit] ⇒ [Register/Import Device Initial Value].

An initial device value editor appears. For details on the operations in the initial device value editor, refer to the following:



- Registering the values in the device memory as the initial device values: [Page 459 Setting initial device values](#)
- Importing the initial device values as values in the device memory: [Page 459 Registering in the device memory](#)

7.4 Writing/Reading Data to/from CPU Module

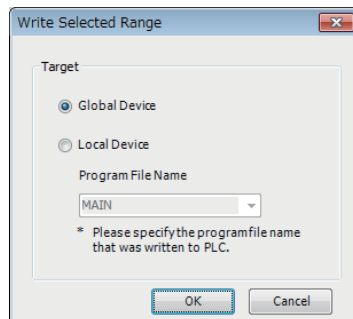
This section explains the method to write/read only the values within the selected range in a device memory editor to/from a CPU module.

To write/read all data in the device memory, use the "Online Data operation" screen. ([Page 597 Writing/Reading Programmable Controller Data](#))

Window

1. Select the writing/reading range in a device memory editor.
2. Select [Online] ⇒ [Device Memory] ⇒ [Read Selected Range] ()/[Write Selected Range] ().

The following screen is an example when writing data.



Operating procedure

Select the device to be written/read, and click the [OK] button.

7.5 Exporting/Importing Device Memory Data

Device memory data can be exported to a CSV file.
In addition, the exported CSV file can be imported.

Exporting device memory data

The following shows the operating procedure to export device memory data to a CSV file.

To export the data, selecting "Word Multi-point" for "Display Unit Format" in the "Display Format" screen is required in advance. (☞ Page 449 Setting the display format)

Operating procedure

1. Select the range of devices to be exported in a device memory editor.
2. Select [Edit] ⇒ [Export to File] (📄).
3. Select the range for export in the "Export Setting" screen.
When selecting "Specify Range," enter the start and end device numbers of the range for export.
4. Select the checkbox of "Export only the rows in which devices already set are included" as necessary, and click the [OK] button.
5. Set each item in the "Export to File" screen, and click the [Save] button.

Point

Device memory data is exported to a CSV file according to the display format of the device values.
Set the display format as necessary; however, selecting "Word Multi-point" for "Display Unit Format" is required.

For the method to set the format, refer to the following:


☞ Page 449 Setting the display format

Importing device memory data

The following shows the operating procedure to import device memory data from a CSV file.

Only a CSV file of device memory data exported in GX Works3 can be imported.

Operating procedure

1. Select [Edit] ⇒ [Import to File] ().
2. Select a CSV file to be imported in the "Import File" screen, and click the [Open] button.
3. Read a displayed message, and select the checkbox of "Clear all memory data of device type to be imported" in "Setting Before Import" as necessary.
4. Click the [OK] button.

■Clearing device memory data before import

Device memory data can be cleared before import by selecting the checkbox of "Clear all memory data of device type to be imported" in "Setting Before Import."

The following table shows the operation depending on the selection status of the checkbox.

| Selection status | Operation |
|------------------|--|
| Selected | All device memory data of the device type to be imported will be cleared, then only the data described in a CSV file will be written. (Example) When D0 to D39 are described in a CSV file, all the D device memory data will be cleared by importing data with the checkbox selected. Then, the device memory data of D0 to D39 will be written. |
| Not selected | Device memory data will be overwritten with the one described in a CSV file. Device memory data that is not described in the CSV file is not changed. |

Precautions

- Data may not be imported properly if a CSV file to be imported is edited.
- After import, check that device memory data is applied properly as intended.
- Device memory data of multiple device types cannot be imported at the same time.
Import device memory data for each device type.


8 INITIAL DEVICE VALUE SETTING

This chapter explains how to set the initial device values.

8.1 Initial Device Values

The initial device values which are managed in GX Works3 refer to data to be written to and read from the devices in a CPU module.

For details on initial device values, refer to the following:


 MELSEC iQ-R CPU Module User's Manual (Application)

 MELSEC iQ-F FX5 User's Manual (Application)

Remote head modules do not support these values.

Applicable devices

For the devices which can be set in an initial device value editor, refer to the following:

 Page 929 Applicable Devices in GX Works3

Writing of the initial device values to global/local devices

Initial device values are not distinguished between a global device or local device.

When writing initial device values to a CPU module, write them to each device according to the following methods.

- Global device: Create initial device value data with a different name from that of the program file, and write it to a CPU module.
- Local device: Create initial device value data with the same name as that of the program file, and write it to a CPU module.

Devices which cannot be used as local devices are not written even if their initial values are set.

FX5CPUs do not support local devices.

8.2 Configuration of an Initial Device Value Editor

This section shows the configuration of an initial device value editor.

Window

Select "Device" ⇒ "Device Initial Value" ⇒ "(data name)" in the navigation window.

Device Initial Value MAIN

| Points | Start | End | Comment |
|--------|-------|-----|---------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |

The device range and the device data that is set above will be written to CPU as initial value.
Users are required to execute "Device Memory Diversion" operation if the device initial range setting is changed.

Setting Method

☒ Start/End

☐ Points/Start

Device Memory Register Diversion

Device Memory for Register Diversion

Register to Device Memory

Device Memory Diversion

OK

Cancel

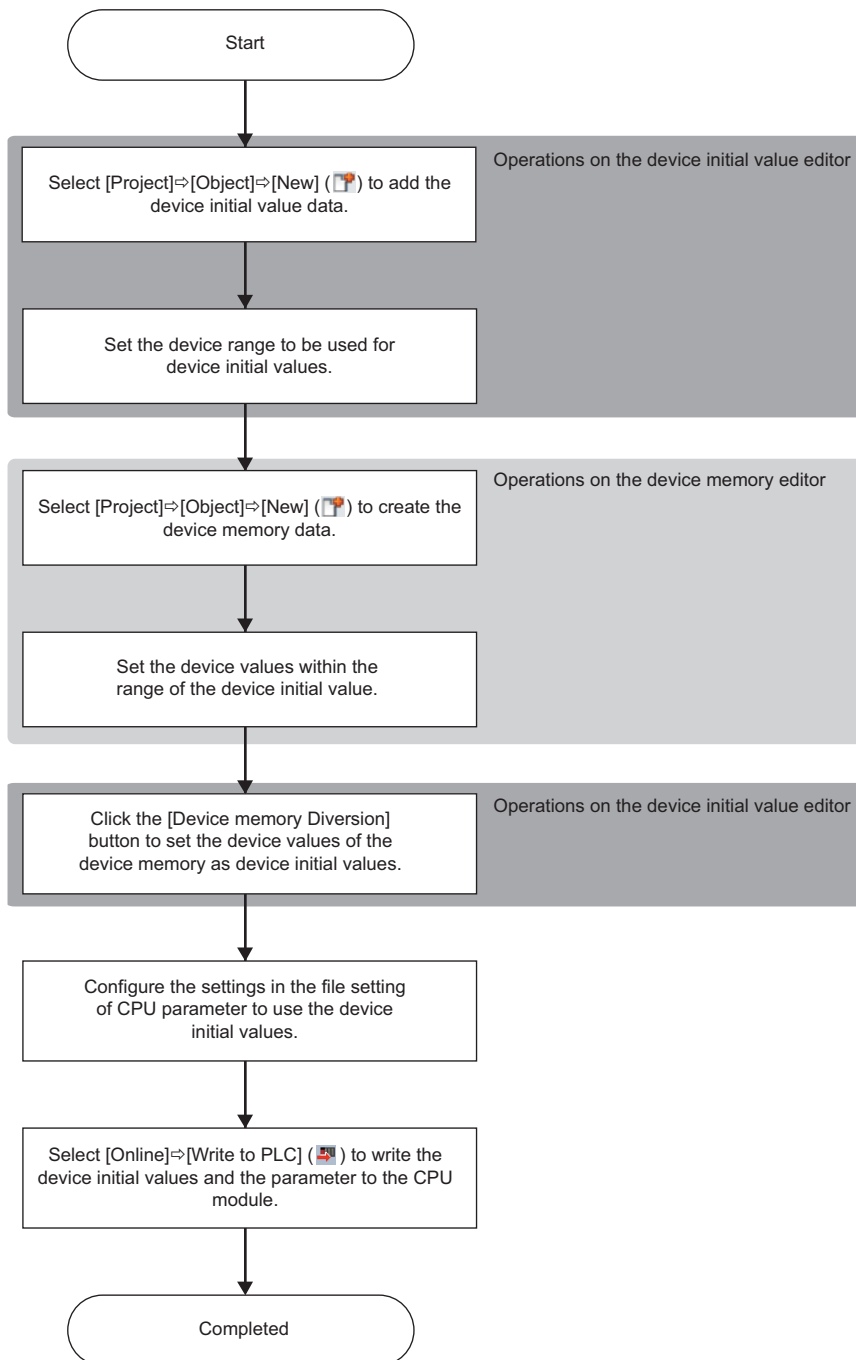


When editing a value in "Start"/"Last"/"Comment" column, the shortcut menu is displayed by pressing the **[Shift] + [F10]** keys.


8.3 Initial Device Value Settings

This section explains the methods for setting device values which was set in the device memory as the initial device values.

Setting procedure of initial device values



Setting initial device values

The following shows the procedure for setting device values which was set in the device memory as the initial device values. Initial device value data should be created in advance. ( Page 132 Creating data)

Operating procedure

1. Set each item in an initial device value editor.
2. Select the data to import from the pull-down list of "Device Memory for Register Diversion," and click the [Register to Device Memory] button.
3. Click the [OK] button.

■Using initial device values

To use each device value in the set range as the initial value when starting a CPU module, specify the name of the file to use in "File Setting" of "CPU Parameter."

■Device range

Device initial values can be set only for the devices in the range set in the following items in CPU Parameters:

- "File Setting" ⇨ "File Register Setting"
- "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Detailed Setting" ⇨ "Device Setting"

Registering in the device memory

Data in the range of the initial values which was set in an initial device value editor is registered in the device memory.

Operating procedure

1. Select data from the pull-down list of "Device Memory for Register Diversion."
2. Click the [Register to Device Memory] button.

If the registered data is modified on the device memory, it will not be applied to the initial device values. Click the [Device Memory Diversion] button in an initial device value editor again.


Point

To check the initial device values, create a new device memory and perform "Register to Device Memory" to it.

9 SEARCHING FOR DATA

This chapter explains operations for searching for and replacing character strings, devices, labels, instructions, etc. in each screen.

| Function | Supported screen | Purpose | Reference |
|---|--|--|---|
| Device/label search Device/label replacement | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • SFC diagram editor • Label editor | To search for/replace devices or labels in a program. | Page 463 Searching for/ Replacing Devices and Labels |
| Instruction search/ replacement | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • SFC diagram editor | To search for/replace instructions in a program. | Page 465 Searching for/ Replacing Instructions |
| Character string search/ replacement | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • SFC diagram editor • Device comment editor • Label editor • Label comment window | To search for/replace character strings used in a program, label, and device comment. | Page 466 Searching for/ Replacing Character Strings |
| Open/close contact change | <ul style="list-style-type: none"> • Ladder editor • FBD/LD editor • SFC diagram editor | To switch the contact type of a specified device in a program from an open contact to a close contact, or from a close contact to an open contact. | Page 468 Changing Contacts between Open Contact and Close Contact |
| Device batch replacement | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor | To replace devices and labels in a program in a batch. | Page 469 Batch Replacing of Devices and Labels |
| Cross reference | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • SFC diagram editor • Label editor • Parameter editor | To check a declaration location and a reference location of a device and label, or a label, which is not used in a program, in a list. | Page 472 Displaying cross reference information |
| Device list | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • SFC diagram editor • Parameter editor | To check the usage of devices. | Page 480 Displaying Device Usage |
| Program search/ replacement | • Ladder editor | To search for devices and labels, or to move to the corresponding row by specifying a step No. in a ladder program. | Page 306 Searching for/replacing data in a program |
| | • ST editor | To move to the corresponding row by specifying a line number on an ST editor. | Page 328 Searching for/replacing data in a program |
| | • SFC diagram editor | To search for devices and labels, or to move to the corresponding row by specifying a block number or block name in an SFC block list. | Page 386 Searching for/replacing data in a program |
| Block information device search | • SFC block list | To search for block information (devices/labels) in an SFC block list. | Page 385 Searching for block information |
| Data flow analysis | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • Parameter editor • Event history (offline monitor) window | To check a range affected by/affecting a specified device or label with a data flow diagram. | Page 482 Displaying a Range Affected by/Affecting a Device/ Label |
| Bookmark | <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • Dataflow analysis window | To register position information of a program. | Page 500 Registering a Bookmark |

- The "Find and Replace" window can also be opened by selecting [View] ⇒ [Docking Window] ⇒ [Find/Replace] ().
- 'Find' and 'Replace' can be switched from the pull-down list of the "Find and Replace" window.
- To replace a label, a device which can be replaced is for one point.
- The search starts from the top of the program in the inline structured text box regardless of the cursor position.



Precautions


- The program will be in the unconverted state after the replacement.
- To replace a label name, check whether a name to be replaced has been already used.
- Data cannot be replaced during monitoring unless a ladder editor is in the monitor write mode. Replace it after ending the monitoring.
- Read-protected data cannot be searched for or replaced. Change the setting for the data so that it can be edited (disabling the security, for example).

Range specification in editors

In a ladder editor, FBD/LD editor, and device comment editor, the target range for the all find function or replace all function can be specified.

A range that can be specified differ depending on an operation in the editor.

| Operation | Range |
|---|---|
| <ul style="list-style-type: none"> • Ladder editor/device comment editor: only one cell is selected • FBD/LD editor: only one element is selected | All cells or elements in the editors |
| <ul style="list-style-type: none"> • Ladder editor: multiple cells are selected • FBD/LD editor: multiple elements are selected • Device comment editor: a row or multiple cells are selected | Selected cells, elements, or rows |
| <ul style="list-style-type: none"> • Device comment editor: a column is selected | Selected row (including undisplayed bit specification information) |
| <ul style="list-style-type: none"> • Device comment editor: All the cells are selected (by  + ) | All (excluding columns which are not displayed in multiple comment display) |

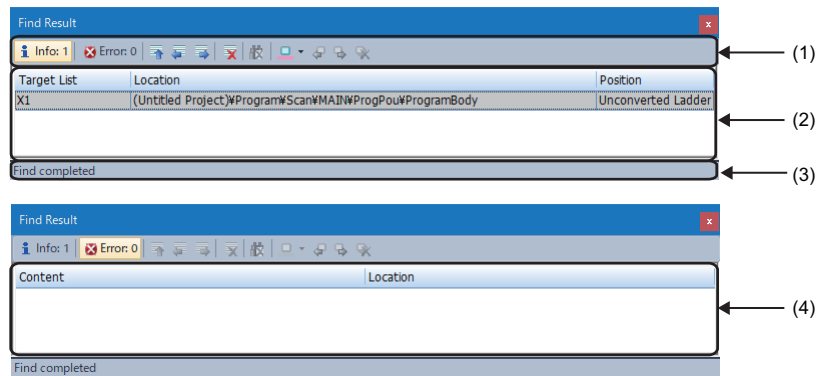
- Multiple cells or elements can be selected by selecting them with the  held down.
- When multiple device comments are selected by dragging in a device comment editor, bit specification information that is not displayed in the editor are also searched or replaced.

Displaying results and error logs

After the all find/replace all function is executed, the results and error logs are displayed.

Window

Click the [All Find] button/[Replace All] button in "Find and Replace" window.



Displayed items

| Item | Description |
|----------------------------|---|
| (1) Status | Displays the number of error logs and the search error. |
| (2) Search/replace results | Displays the position information to specify the location where data was searched for/replaced. |
| (3) Sub status bar | Displays the search/replace result. |
| (4) Error logs | Displays the errors in search/replace results. |

Point

The jump function is used to jump from any row of search/replace results or logs to the corresponding character strings.

To jump, select and right-click a row and select [Jump to the Selected Location]/[Jump to the Previous Location]/[Jump to the Next Location] from the shortcut menu, or double-click a row.

A row displayed in the "Find Result" screen can be highlighted.

☞ Page 477 Highlighting display

9.1 Searching for/Replacing Devices and Labels

Search for/replace devices or labels in a program.

Supported editor: Ladder editor^{*1}, ST editor, FBD/LD editor^{*1*2}, SFC diagram editor^{*1}, and label editor

^{*1} Assigned devices which are set to display in the following menu are not searched for/replaced.

[View] ⇒ [Device Display]

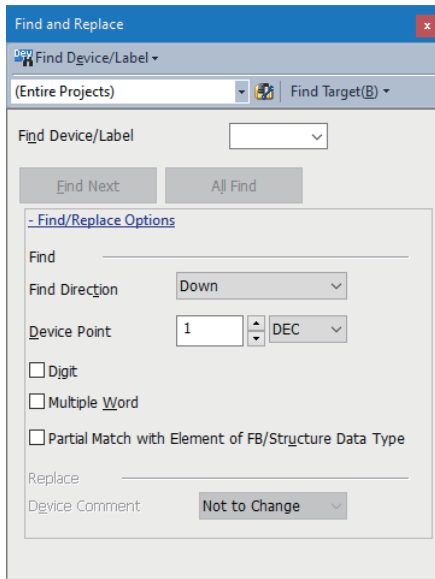
^{*2} The preview display area of inline structured text elements is not supported.

When searching a device name, it is also searched on the global editor where the device is assigned.

Window

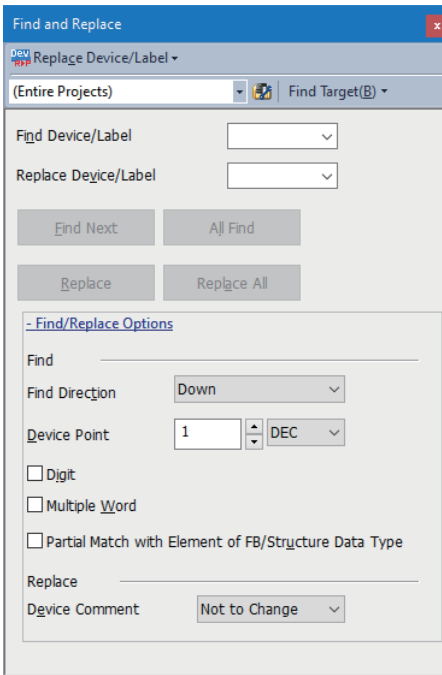
Select [Find/Replace] ⇒ [Find Device/Label] ()/[Replace Device/Label].

Find Device



The 'Find Device' dialog box has a title bar 'Find and Replace' with a close button. Below is a dropdown menu 'Find Device/Label' with a 'Find Target(B)' button. A search field 'Find Device/Label' is present. Buttons 'Find Next' and 'All Find' are shown. A section '- Find/Replace Options' contains: 'Find' section with 'Find Direction' (Down) and 'Device Point' (1, DEC); checkboxes for 'Digit', 'Multiple Word', and 'Partial Match with Element of FB/Structure Data Type'; and 'Replace' section with 'Device Comment' (Not to Change).

Replace Device



The 'Replace Device' dialog box has a title bar 'Find and Replace' with a close button. Below is a dropdown menu 'Replace Device/Label' with a 'Find Target(B)' button. Fields for 'Find Device/Label' and 'Replace Device/Label' are present. Buttons 'Find Next', 'All Find', 'Replace', and 'Replace All' are shown. A section '- Find/Replace Options' contains: 'Find' section with 'Find Direction' (Down) and 'Device Point' (1, DEC); checkboxes for 'Digit', 'Multiple Word', and 'Partial Match with Element of FB/Structure Data Type'; and 'Replace' section with 'Device Comment' (Not to Change).

Operating procedure

Set each item on the screen and click the [Find Next] button.

| Item | | | Description |
|----------------------|---------|--|---|
| Find/Replace Options | Find | Device Point | Enter the number of points to be searched for/replaced, counted from the device entered in the "Find Device/Label" field. When a label is entered for "Find Device/Label" or "Replace Device/Label," enter 1. Example) When X50 for "Find Device," X100 for "Replace Device," 3 for "Device Point," and "DEC" for entered value are set The devices are replaced as follows: X50→X100, X51→X101, X52→X102 |
| | | Digit | Select this checkbox to search for the entered device and digit-specified bit devices that include the entered device. |
| | | Multiple word | Select this checkbox to search for the entered device and the double-word format word devices that include the entered device. |
| | | Partial Match with Element of FB/Structure Data Type ^{*1} | Select this checkbox to search for the target used for arguments of function blocks ^{*2} , arguments of functions ^{*2} , and structure members in a program. |
| | Replace | Device comment | Select this to copy or move a device comment in "Find Device/Label" to "Replace Device/Label" (excluding step relays (S) and SFC transition devices (TR)). |

^{*1} Even when the checkbox of this item is selected, the input/output labels of FB instances are not searched for or replaced if "Include the input/output label of FB instance" under "Find Target" is not selected.

^{*2} A label whose class is "VAR_INPUT", "VAR_OUTPUT," "VAR_OUTPUT_RETAIN," "VAR_IN_OUT," "VAR_PUBLIC," or "VAR_PUBLIC_RETAIN" is searched.

When entering a label name, options will be displayed.

They can also be displayed by any of the following operations.

- Enter '.' at the end of a label name of structure type or an instance name.
- Press the **Ctrl** + **Space** keys.

In addition, by selecting "Yes" for the following option, when entering a common device comment or a label comment, devices and labels for which the comment has been set can be displayed as options.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

By using the following menu, the cursor jumps forward or backward from the current position to the positions where search or replacement was applied.

- [Find/Replace] ⇒ [Previous] (🔍) / [Next] (🔍)

By selecting "Include the input/output label of FB instance" under "Find Target," the input/output labels of FB instances in a ladder program or FBD/LD program are also searched for or replaced.

Examples of device search

■ Options

- Option: None

| Device specification | Search result |
|----------------------|---|
| M0 | <u>M0</u> , <u>K4M0</u> , <u>M0Z0</u> , <u>K4M0Z0</u> |
| K4M0 | <u>K4M0</u> , <u>K4M0Z0</u> |
| D0 | <u>D0</u> , <u>D0Z0</u> , <u>D0.1</u> |
| D0.1 | <u>D0.1</u> |
| J1\B0 | <u>J1\B0</u> , <u>J1\B0Z0</u> , <u>J1Z0\B0</u> , <u>J1Z0\B0Z0</u> , <u>J1\K4B0</u> , <u>J1\K4B0Z0</u> , <u>J1Z0\K4B0</u> , <u>J1Z0\K4B0Z0</u> |

- Option: Digit

| Device specification | Search result |
|----------------------|------------------------------|
| X0 to X3 | K1X0 |
| X0 to X0F | K4X0 |
| X0 to X1F | K8X0 |
| X0Z0 | X0Z0, K1X0Z0, K4X0Z0, K8X0Z0 |

- Option: Multiple words

| Device specification | Search result |
|----------------------|--|
| D0 to D1 | DMOV K1 <u>D0</u> , EMOV E1 <u>D0</u> , DMOV K1 <u>@D0</u> |
| D0 to D9 | BMOV <u>D0</u> D100 K10 |
| J1\W0 to J1\W1 | DMOV K1 <u>J1\W0</u> |
| @D0 to @D1 | DMOV K1 <u>@D0</u> |
| T0 to T1 | DMOV K1 <u>T0</u> |
| D0 to D1 | D0:D, D0:DU, D0:E |
| D0 to D3 | D0:ED |

■ Device with device type specifier (for ST editor, FBD/LD editor, and SFC diagram editor only)

| Device specification | Search result | Remarks |
|----------------------|---|---|
| D100 | <u>D100</u> : = 1; <u>D100</u> : D: = 1; <u>D100</u> : E:= 0.1; | Devices are searched regardless of device type specifier. |
| D100: D | D100: = 1; <u>D100</u> : D: = 1; D100:E := 0.1; | Only devices with a specified device type specifier are searched. |

9.2 Searching for/Replacing Instructions

Search for/replace instructions in a program.

Supported editor: Ladder editor, ST editor, and FBD/LD editor (LD element and FBD element (FB/FUN) only), and SFC diagram editor

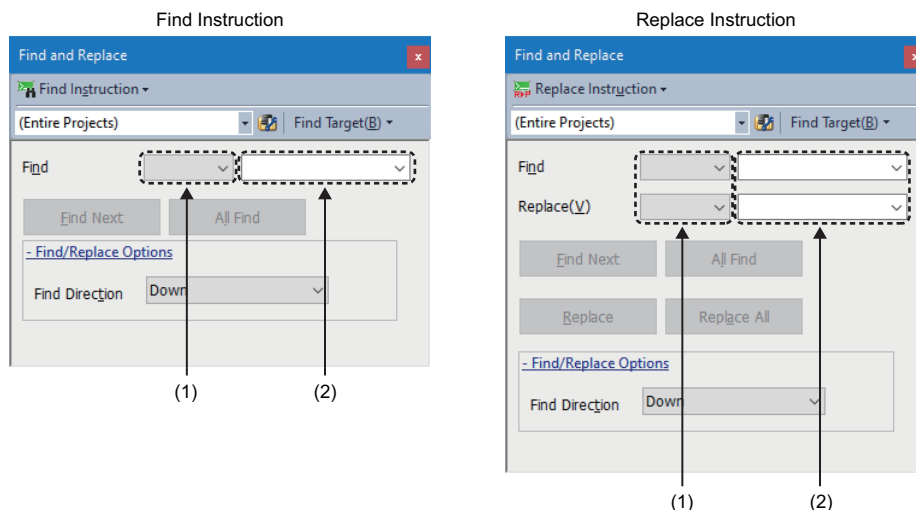
The NOP instructions used in a ladder program cannot be searched.

The following application instructions can also be searched as output instructions.

SET, RST, PLS, PLF, FF, SFT, SFTP, and MC

Window

Select [Find/Replace] ⇒ [Find Instruction] ()/[Replace Instruction]/[Find Contact or Coil] ()



(1): Element selection field

(2): Device instruction input field

Operating procedure

Set each item on the screen and click the [Find Next] button.

Point

By using the following menu, the cursor jumps forward or backward from the current position to the positions where search or replacement was applied.

- [Find/Replace] ⇒ [Previous] ()/[Next] ()

By selecting "Include the input/output label of FB instance" under "Find Target," the input/output labels of FB instances in a ladder program or FBD/LD program are also searched for or replaced.

Examples of instruction search

| Example of instruction specification ^{*1} | Search result |
|--|---|
| MOV | <u>MOV</u> , <u>MOVP</u> |
| MOVP | <u>MOVP</u> |
| MOV D0 K4Y0 | <u>MOV D0 K4Y0</u> , <u>MOVP D0Z1 K4Y0</u> , <u>MOV D0 K4Y0Z1</u> , <u>MOVP D0Z1 K4Y0Z1</u> |
| MOVP D0 J1W0 | <u>MOVP D0 J1W0</u> , <u>MOVP D0Z1 J1W0</u> , <u>MOVP D0 J1Z1W0Z1</u> , <u>MOVP D0Z1 J1Z1W0Z1</u> |

^{*1} The search specifying an argument can only be performed in ladder programs.

9.3 Searching for/Replacing Character Strings

Search for/replace character strings of the data in the project.

| Editor | Searchable character string | Replaceable character string |
|-----------------------|--|--|
| Ladder editor | Character strings except for the following ^{*1} • Assigned devices displayed on the editor ^{*2} | Character strings except for instruction names |
| ST editor | Character strings except for the following • Monitoring part (displayed on the right side of the screen during monitoring) • The omitted portion of the collapsed display (example: IF...END_IF) | |
| FBD/LD editor | Character strings except for the following • Assigned devices displayed on the editor ^{*2} • Inline structured text programs displayed in the preview display area of inline structured text elements | Character strings except for the following • Data type of a function • Data type of a function block • Input/output label of FB/FUN • Character string, "RETURN" of a return element • Assigned devices displayed on the editor by setting the option ^{*2} • Inline structured text programs displayed in the preview display area of inline structured text elements |
| SFC diagram editor | Character strings except for the following • Assigned devices displayed on the editor ^{*2} | Character strings except for the following • Qualifier • Comment of Step No./Transition No. • Step name specified to the jump destination |
| Label editor | Character strings except for class name | Character strings except for the following • Class name, data type, device name |
| Device comment editor | Character strings in the comment column | |
| Label comment window | | |

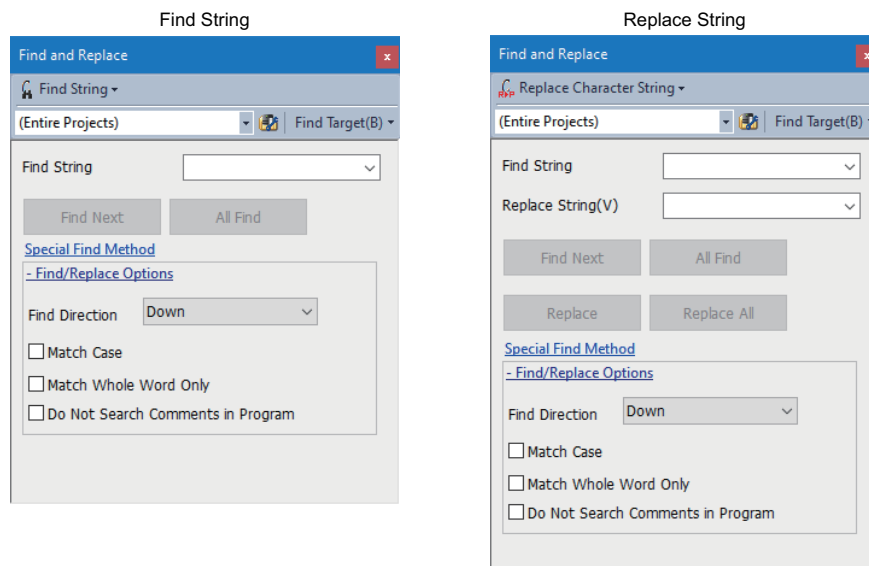
*1 The NOP instructions used in a ladder program cannot be searched.

*2 An assigned device is shown or hidden by setting in the following menu.

[View] ⇒ [Device Display]

Window

Select [Find/Replace] ⇒ [Find String]/[Replace Character String].



Operating procedure

Set each item on the screen and click the [Find Next] button.



By using the following menu, the cursor jumps forward or backward from the current position to the positions where search or replacement was applied.

- [Find/Replace] ⇒ [Previous] ()/[Next] ()

A note, P statement, and I statement in a ladder editor can be searched or replaced if a coil, instruction, pointer, or interrupt pointer, to which the note or statement is added, is selected.

By entering '@STB' or '@IST,' an inline structured text box or inline structured text element can be searched for.

Precautions

When searching for a comment in a program by using the character string search function, it may take time to display the result. When searching for character strings excluding a comment in a program, select the following checkbox:

- "Find/Replace Options" ⇒ "Do Not Search Comments in Program"

Searching for/replacing data by matching whole word only

The whole word means a string delimited by the break characters.

The character string which is completely match with the character string entered in "Find String" is searched for.

Break characters are shown as below.

- Space
- Tab
- Line feed
- Operator on ST editor

Ex.

Search for a device comment 'abc ; def' by the following character strings.

| String to be searched for | Search result | |
|---------------------------|-------------------------|-------------------------|
| | Unselected | Selected |
| a | <u>abc</u> ; def | Nothing is found. |
| abc | <u>abc</u> ; def | <u>abc</u> ; def |
| bc | <u>abc</u> ; def | Nothing is found. |
| abc ; def | <u>abc</u> ; <u>def</u> | <u>abc</u> ; <u>def</u> |

9.4 Changing Contacts between Open Contact and Close Contact

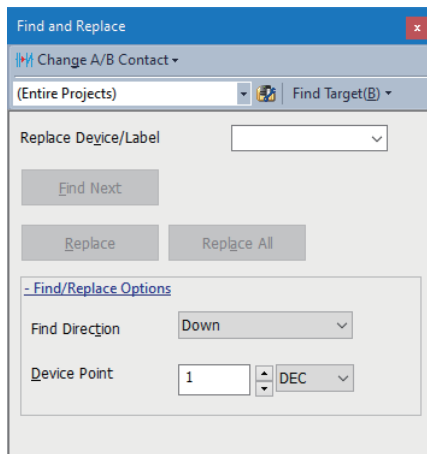
Change contact types from open contact to close contact, and vice versa.

Supported editor: Ladder editor, FBD/LD editor^{*1}, and SFC diagram editor

^{*1} The preview display area of inline structured text elements is not supported.

Window

Select [Find/Replace] ⇒ [Change Open/Close Contact].



Operating procedure

1. Set each item on the screen and click the [Find Next] button.

| Item | | Description |
|----------------------|--------------|--|
| Find/Replace Options | Device Point | Enter the number of points to be replaced, counted from the device/label entered in the "Replace Device/Label" field. When a label is entered for "Replace Device/Label," enter 1. Example) When X100 for "Replace Device," 3 for "Device Point," and "DEC" for entered value are set The open/close contact of X100, X101, and X102 will be replaced. |

2. Click the [Replace] or [Replace All] button to change the contact type.



When entering a label name, options will be displayed.

They can also be displayed by any of the following operations.

- Enter '.' at the end of a label name of structure type or an instance name of a function block.
- Press the **Ctrl** + **Space** keys.

In addition, by selecting "Yes" for the following option, when entering a common device comment or a label comment, devices and labels for which the comment has been set can be displayed as options.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

By using the following menu, the cursor jumps forward or backward from the current position to the positions where search or replacement was applied.

- [Find/Replace] ⇒ [Previous] (🔍) / [Next] (🔍)

9.5 Batch Replacing of Devices and Labels

Replace devices and labels in a program in a batch.

Supported editor: Ladder editor, ST editor, FBD/LD editor^{*1}, and SFC diagram editor, label editor (for replacing labels)

^{*1} The preview display area of inline structured text elements is not supported.

Window

Select [Find/Replace] ⇒ [Device Batch Replace].

Operating procedure

Set each item on the screen, and click the [Replace All] button.

| Item | Description |
|-----------------------------|--|
| Find Device, Replace Device | Enter a device name and label name which are to be searched and replaced. To replace a structure type label, enter a text including the structure member for "Find Device" or "Replace Device." To replace an array type label, enter a text including an array index for "Find Device" or "Replace Device." |
| Points, Point Format | Enter the number of points to be replaced from the device specified in the "Find Device." Example) When X0 for "Find Device," X10 for "Replace Device," 5 for "Points," and "DEC" for "Point Format" are set The devices are replaced as: X0 → X10, X1 → X11, X2 → X12, X3 → X13, X4 → X14 When a label is entered for "Find Device" or "Replace Device," it will be treated as '1' entered even if a point other than '1' is entered. |
| Replace Options | Device Comment |
| | Select whether to copy/move a device comment in "Find Device" to "Replace Device" (excluding S/TR). |

Point

Select a range of device/label on a ladder editor by a drag-and-drop operation to register multiple devices/labels in batch.

When entering a label name, options will be displayed.

They can also be displayed by any of the following operations:

- Enter '.' at the end of a label name of structure type or an instance name of a function block.
- Press the **[Ctrl]** + **[Space]** keys.

In addition, by selecting "Yes" for the following option, when entering a common device comment or a label comment, devices and labels for which the comment has been set can be displayed as options.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

Precautions

When specifying a step relay (S) or SFC transition device (TR) for "Find Device" and select "(Entire Projects)" for the target, the step relay (S) or SFC transition device (TR) of all blocks are replaced. (Example: when replacing 'TR0,' 'BL0\TR0' and 'BL1\TR0' also are replaced.)

When copying and pasting a device to be searched for or replaced from other applications such as Excel into the "Device Batch Replace" screen, the default value '1' is entered to a cell in which no point is entered.

9.6 Displaying Device and Label Reference Information

A project can be searched to identify where a selected device/label is used, and the information is displayed in a list. A cross reference window is displayed horizontally when it is docked on the top or bottom of the main frame, and displayed vertically when it is docked on the left or right of the main frame.

Point

The display format and detailed operation settings for each function can be set by setting the following option.
[Tool] ⇒ [Options] ⇒ "Find/Replace" ⇒ "Cross Reference"

Target data for creating cross reference information

Cross reference information is created based on devices used in the following data.

- Ladder programs
- ST programs
- FBD/LD programs
- SFC programs
- Global label
- Local label
- Structure
- Multiple CPU refresh setting in CPU parameters
- Refresh setting in module parameters
- Simple CPU communication setting in module parameters
- Simple device communication setting in module parameters
- External device configuration in module parameters
- Safety communication setting in module parameters

In a project for an FX5CPU, the cross reference information of devices used for both the CPU built-in functions and the parameter settings of extension modules and communication adapters are created.

Displaying cross reference information

Create and display the cross reference information of the devices/labels used in the project.

Supported editors: ladder editor, ST editor, FBD/LD editor, SFC diagram editor, label editor^{*1,*2}, and parameter editor^{*2}

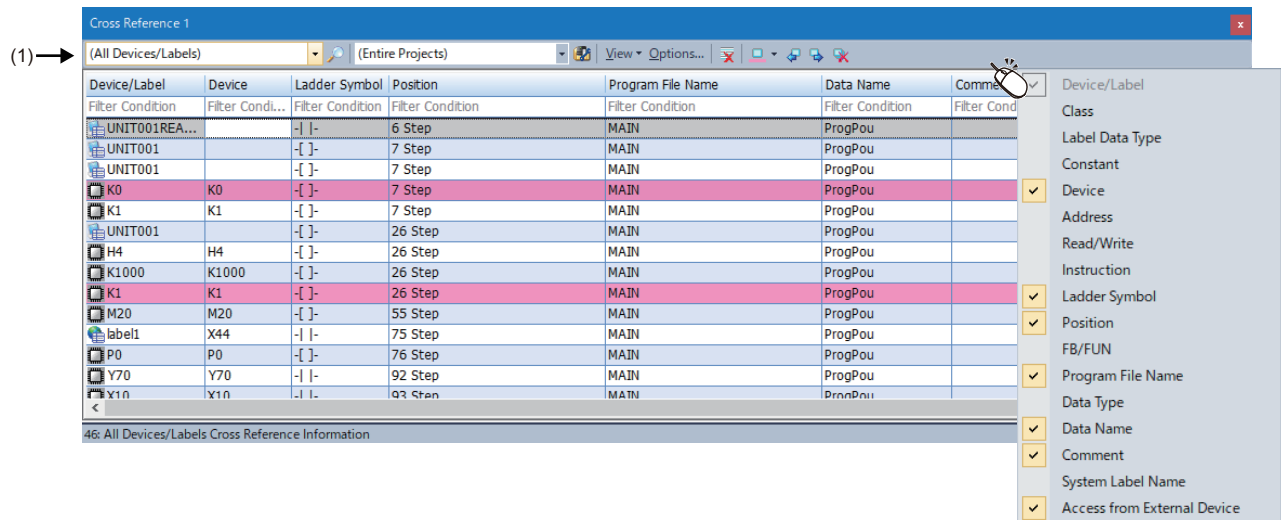
^{*1} When "Yes" is selected in the following option setting, data on a label editor is used for this operation.

[Tool] ⇒ [Options] ⇒ "Find/Replace" ⇒ "Cross Reference" ⇒ "Find Condition" ⇒ "Find Label Definition"

^{*2} When "(Current Window)" is specified, data in a label editor is not used for this operation.

Window



Select [View] ⇒ [Docking Window] ⇒ [Cross Reference 1/Cross Reference 2] ().



Up to two cross reference windows can be displayed at once.

















Up to 79999 pieces of cross reference information is displayed in each cross reference window.

Operating procedure

1. To specify a range to be searched, select the search location of a device/label by clicking  in the toolbar (1). (Multiple selections allowed.)
2. Enter a device name or a label name to search for in the column in which "(All Devices/Labels)" is displayed.
3. Click .

If searching for devices/labels while "(All Devices/Labels)" is displayed in the column, the cross reference information of all devices/labels is displayed.

To clear the displayed cross reference information, click .

- By selecting a row in the result list and performing any of the following operations, the cursor jumps to the position where the selected device or label is used.
 - Double-click the row.
 - Right-click the row, and select [Jump] from the shortcut menu.
 - Press the  key.
- After the cursor jumped from a cross reference window to a program editor, label editor, or SFC block list, by using the following menu, the cursor jumps forward or backward from the current position to positions where were searched before.
 - [Find/Replace] ⇒ [Previous] ()/[Next] ()
- Cross reference information can also be created by selecting and right-clicking a device/label in a program editor or in the "Label Comment" window, then selecting [Cross Reference] from the shortcut menu.
- By pressing the  key ( + ), the focus will move between the editor and a cross reference window.
- By pressing the  key ( + ) /  +  keys ( +  + ), the cursor in a cross reference window will move to the previous/next row.
- By selecting "No" for the following option, the cursor remains in a cross reference window even when jumping to each editor from the window. Therefore, the cursor can move to the previous/next row in the window by pressing the  /  key after the jump.
 - [Tool] ⇒ [Options] ⇒ "Find/Replace" ⇒ "Cross Reference" ⇒ "Operational Setting" ⇒ "Jump with cursor in jumping"

■Device/label options

Device or label options can be displayed in the input field by setting the following options as shown below.

| Option | Value |
|---|-------|
| [Tool] ⇒ [Options] ⇒ "Find/Replace" ⇒ "Cross Reference" ⇒ "Operational Setting" ⇒ "Auto-fill device/label name to display based on input history" | No |
| [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Operational Setting" ⇒ "Instruction/Device/Label name Prediction" | Yes |

After setting these options, device or label options are displayed by any of the following operations:

- Enter a device or label name in the input field.
- Enter '.' at the end of a label name of structure type or an instance name of a function block.
- Press the **Ctrl** + **Space** keys.

In addition, by selecting "Yes" for the following option, when entering a common device comment or a label comment, devices and labels for which the comment has been set can be displayed as options.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

■Specification method for label type and range

By entering a label name, to which a character string such as a program block name is appended, in the input field, the type and range of the label to be searched for can be specified.

When entering a label name, refer to the following example.

| Example name | | Type of label to be searched | Search range ^{*1} |
|--------------------------------|------------------|------------------------------|--|
| Label name | bLabel1 | Global label | Entire project |
| Program block name/label name | ProgPou/bLabel1 | Local label | Program block whose name is the same as the entered one |
| Function block name/label name | FbPou/bLabel1 | | <ul style="list-style-type: none"> • Program body of a function block whose name is the same as the entered one • Program body in which an FB instance or function block element whose name is the same as the entered one is used |
| Function name/label name | FunPou/bLabel1 | Global label ^{*2} | Program body of a function whose name is the same as the entered one |
| | | Local label | |
| Program file name/label name | MAIN/bLabel1 | Global label | Program file whose name is the same as the entered one |
| FB file name/label name | FBFILE1/bLabel1 | | FB file whose name is the same as the entered one |
| FUN file name/label name | FUNFILE1/bLabel1 | Global label ^{*2} | FUN file whose name is the same as the entered one |
| | | Local label | |
| /Label name | /bLabel1 | Global label | Entire project |

*1 When the following option is set to "Yes," a label editor is included in the search range.

[Tool] ⇒ [Options] ⇒ "Find/Replace" ⇒ "Cross Reference" ⇒ "Find Condition" ⇒ "Find Label Definition"

*2 Not searched for if a function is created in Ladder Diagram language.

■Device assigned to a label

Global labels and devices assigned to the global labels can be searched for at the same time.

In the following option, whether or not to search for assigned devices can be selected.

- [Option] in the toolbar ⇒ "Find Condition" ⇒ "Include Assigned Device in Finding Label Name"

■Array

In the following option, a constant label used as an array index can be analyzed, and whether or not to search for a label considering a constant value can be selected.

- [Option] in the toolbar ⇒ "Find Condition" ⇒ "Analyze and Find Constant in Find When Constant Label is Specified in Array Element"

■Automatic synchronization

This function automatically creates the cross reference information of a device or label selected in an editor or in the "Label Comment" window.

The cross reference window used for displaying the automatic synchronization result can be specified by selecting "Options" in the window and setting the items in "Operational Setting" on the "Option" screen.

In addition, when performing an automatic synchronization, the timing of cross reference information update can be specified. Note that this function cannot be used in a parameter editor.

■Local label selected in an editor



When displaying a cross reference window while a local label is selected in a program editor, the names of both the program in which the label is used and the label are automatically entered in the input field. (Example: When displaying a cross reference window while selecting the label 'bLabel1' which is used in the program file 'ProgPou,' 'ProgPou/bLabel1' is automatically entered in the input field.)

■Device or label selected in an editor

When selecting a device or label, which is displayed in the search result of a cross reference window, in any of the following editors, the row of the device or label in the search result is also selected.

- Ladder editor
- ST editor
- FBD/LD editor
- SFC diagram editor
- Label editor

In an ST editor, select the entire name of a device or label by any of the following operations.

- Double-click the device or label.
- Drag the mouse cursor from left to right on the device or label.
- Place the mouse cursor on the device or label and press the  +  keys.

Precautions

Even if a device or label is selected in an editor when "Not Auto-tracking" is selected for the following option, the corresponding row in the search result will not be selected.

- [Tool] ⇒ [Options] ⇒ "Find/Replace" ⇒ "Cross Reference" ⇒ "Operational Setting" ⇒ "Display Destination of Auto-tracking Result"

Information to be displayed

■Array

When searching for a label using a character other than number (such as a constant or a device) for an array index, a device that is assigned to the first element within the array element set for the data type of this label is displayed in the "Device" column.

■Displaying data types of arguments of an FB/FUN

For FBD/LD programs or SFC programs (FBD/LD elements), the data type of an FB/FUN using devices/labels as arguments can be displayed in the "FB/FUN" column.

Contacts, coils, and variable elements are displayed.

Up to 10 data types of an FB/FUN can be displayed for one element.

■Displaying and editing comments

- For a ladder, the comments specified in [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target" are displayed as device comments.
- To edit a comment, open the editor where the comment is defined by selecting and right-clicking a row arbitrarily in the search result in a cross reference window, then selecting [Comment Edit] from the shortcut menu.

 Page 411 Device comments

■Device assigned to a label

When searching for a label definition by entering the name of the device which is assigned to labels, only labels that the assigned device name matches completely with the entered name are displayed in a search result. (Example: By entering 'D0' to search for a label definition, only the labels to which 'D0' is assigned are displayed in a search result. Labels to which an index-modified device such as 'D0Z0' is assigned are not displayed.)

Information not to be displayed

The following data is not displayed in a cross reference window:

- Data protected by security
- Devices/labels set in module parameters of an unmounted module

Incorrect cross reference information is displayed

- When deleting data after converting, and displaying cross reference information, the deleted data may be displayed in the search result. To display the latest information, convert again and display the cross reference information.
- If a program or the option setting is changed, cross reference information does not correspond with the program. In order to update the cross reference information, display it again.

Filtering display

Cross reference information being displayed can be filtered.

Operating procedure

Enter or select a filtering condition, and press the  key.

■Filtering condition

The previously entered keywords can be selected from the pull-down list.

For "Data Name" and "Program File Name," search results can also be selected from the list as well as previously entered keywords.

■Tree display of filtering condition

Only data of which components match with the filtering conditions are displayed in the tree format when filtering display is performed for the structure data names or the instance names of the function block.

■Deleting a filtering condition

Filtering of a column can be cleared by deleting the keyword entered as a filtering condition for the column.

■Keywords for a filtering condition

The following table shows the wild cards that can be set as keywords in filtering conditions to search for a character string.

Ex.

When setting a filtering condition for the device/label column

| Wild card | Target | Example | Result |
|-----------|--|----------|-------------------------------|
| * | Any character string | *30* | ready301, K4X30, K1Y30, K4Y30 |
| ? | Any one character | K4?30 | K4X30, K4Y30 |
| [] | Any one of specified characters | [XY]8 | X8, Y8 |
| [!] | Any one character except for one in the brackets | K4X[!3]0 | K4X40 |
| [-] | Character strings within the range in the brackets | D[0-2] | D0, D1, D2 |

Hierarchical display

A structure/array/function block can be displayed hierarchically.

If a device uses two or more points in an instruction, devices after the start device can also be displayed.

Operating procedure

Select the checkbox of "Display Hierarchically" under the [View] menu on the toolbar.

Sorting display

The columns can be sorted in ascending/descending order by clicking the column header. However, they cannot be sorted if a structure/array/function block is hierarchically displayed.



Highlighting display

A displayed row can be highlighted.

Operating procedure

Select a row and click  (Set/Clear Highlight) on the toolbar.

Point

The color of a row to be highlighted can be selected by clicking  next to  (Set/Clear Highlight) on the toolbar. Rows can be color-coded with this function.

Moreover, by clicking  (Previous Highlight) or  (Next Highlight), the cursor jumps to the previous or next highlighted row.

Displaying a list of unused labels

The following labels which are not used in a project can be displayed in a cross reference window.

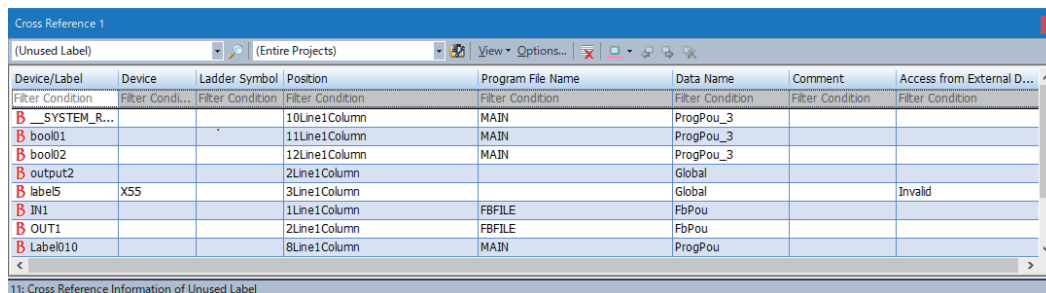
- Global labels which are not used in all POU's
- Local labels which are not used in POU's in a search range

Displayed labels can also be deleted in the window.

Supported editor: Label editor

Window

Select [Find/Replace] ⇒ [Unused Label List].



| Device/Label | Device | Ladder Symbol | Position | Program File Name | Data Name | Comment | Access from External D... |
|-----------------|--------|---------------|---------------|-------------------|-----------|---------|---------------------------|
| B __SYSTEM_R... | | | 10Line1Column | MAIN | ProgPou_3 | | |
| B bool01 | | | 11Line1Column | MAIN | ProgPou_3 | | |
| B bool02 | | | 12Line1Column | MAIN | ProgPou_3 | | |
| B output2 | | | 2Line1Column | | Global | | |
| B label5 | X55 | | 3Line1Column | | Global | | Invalid |
| B IN1 | | | 1Line1Column | FBFILE | FbPou | | |
| B OUT1 | | | 2Line1Column | FBFILE | FbPou | | |
| B Label010 | | | 8Line1Column | MAIN | ProgPou | | |



■ Search without specifying a range

Operating procedure

Click .

■ Search with specifying a range

Operating procedure

1. Click .
2. Select the checkbox of data to be searched in the "Reference Tree for Find In" screen. (Multiple selections allowed.)
3. Click .

Point

After the cursor jumped from a search result to a program editor, label editor, or SFC block list, by using the following menu, the cursor jumps forward or backward from the current position to the positions where search was applied.

- [Find/Replace] ⇒ [Previous] () / [Next] ()

Precautions

- Function blocks, functions, and structures which are not utilized in a program are not searched for.
- A label used in "Block Information" in the "Properties" screen of an SFC block as an array index is regarded as an unused label if it is not used in a program.
- Labels specified as aliases are not detected as unused labels even when these are not used in a program.

Deleting unused labels

Unused labels can be deleted in a cross reference window.

Operating procedure

1. Select a label in a search result list. (Multiple selections allowed.)
2. Right-click the label and select [Delete Label] from the shortcut menu.

Precautions

- When a label is deleted, the program related to the deleted label will be in the unconverted state.
- When utilizing a function block/function in a program, an input argument and an output argument which are not used in the function block/function are treated as unused ones. Note that the definition of a function block/function is changed when deleting an input argument and an output argument.
- When VAR_PUBLIC and VAR_PUBLIC_RETAIN are not used in the function block of the definition source, these are detected as unused labels even when used in a program other than the function block of the definition source.
- When a label name of an input/output argument of a function block utilized in an ST program corresponds to a local label name in the ST program, it is not detected as an unused label.

9.7 Displaying Device Usage

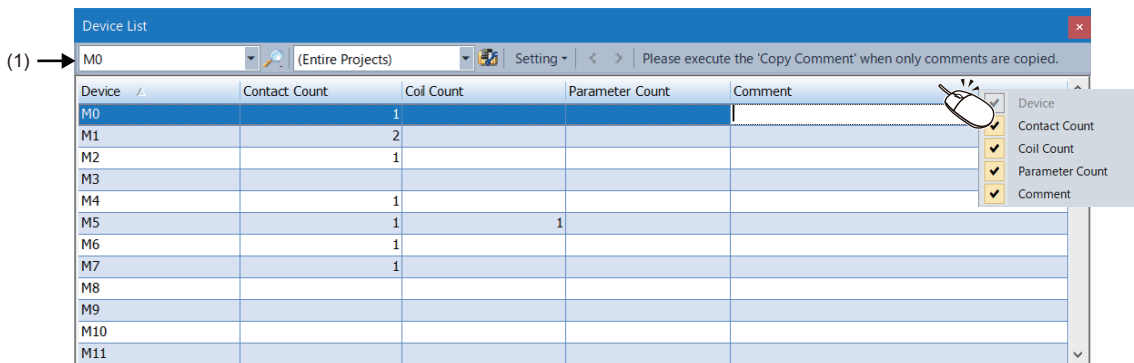
Display the usage of the specified devices.

Supported editor: Ladder editor, ST editor, FBD/LD editor, SFC diagram editor, and parameter editor*¹

*¹ When "(Current Window)" is specified, data in the parameter editor is not used for this operation.


Window

Select [Find/Replace] ⇒ [Device List].



Operating procedure

Set each item and press the **[Enter]** key.

To specify the range to be searched, select the search location of a device/label by clicking  in the toolbar (1). (Multiple selections allowed.)

To set the display format, set it in the screen displayed by selecting [Setting] ⇒ [Batch Setting] in the tool bar (1).

Point

- A device comment can be entered or edited in the Device List. Enter a comment in "Comment" column and press the **[Enter]** key.
- By any of the following operations, only comment can be copied or pasted.
 - Right-click and select [Copy Comment] from the shortcut menu.
 - Right-click and select [Paste Comment] from the shortcut menu, alternatively, press the **[Ctrl] + [V]** keys.
- The editor where the comment is defined is opened by selecting and right-clicking a row in the Device List, then selecting [Comment Edit] from the shortcut menu.

Considerations

■ Searching for coil instructions

As output instructions, the following application instructions can also be searched for:

SET, RST, PLS, PLF, FF, SFT, SFTP, and MC

■ Searching for assigned devices

The following devices cannot be searched for even when they are assigned to labels:

- Double-word device (LT, LST, LC, and LZ)
- Indirect-specified device
- Digit-specified device (used in an editor except for a ladder editor)

■ Searching for file registers (R/ZR)

File registers (R) and (ZR) are distinguished when searching the device list.

Specify them separately when searching for R devices or ZR devices.

FX5CPUs do not support file registers (ZR).

■ Searching for step relays (S)

when searching for a step relay (S), specify a step relay with block specification (BL□\S).

■Searching for devices set in module parameters


Devices set in module parameters of an unmounted module cannot be searched for.

■Checking the locations of devices used



The locations of devices used can be checked by opening a cross reference window from the device list. Select a row in the list and perform any of the following operations to open a cross reference window:

- Press the **Ctrl** + **E** keys or press the **Enter** key.
- Double-click the row.
- Right-click and select [Cross Reference] from the shortcut menu.

For details on the cross reference function, refer to the following:

 Page 471 Displaying Device and Label Reference Information

■Displaying and editing comments

- When searching data by selecting one program, comments specified in [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target" are displayed. ( Page 411 Device comments)
- When searching data by selecting multiple programs, common device comments are displayed.
- By entering a comment while one program is selected and searched, the device comment is applied to the device comment set in the following option. ( Page 411 Device comments)
 - [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target"

9.8 Displaying a Range Affected by/Affecting a Device/Label

The data flow analysis can display a range affected by/affecting a specified device or label (analysis target) with a data flow diagram where the target is set as the base point.


A range affected by/affecting a specified device or label can be checked visually, which makes it easier to specify a cause when an error occurs.

The following table shows the functions of data flow analysis.

| Function | Description | Reference |
|-------------------------------------|---|--|
| Device/label analysis | To display a range affected by/affecting a device or label in a data flow diagram | Page 487 Analyzing devices/labels |
| AI analysis for equipment operation | To estimate physical relation among devices in equipment operation, and display it in a data flow diagram | Page 490 Analyzing equipment operation with AI |
| Device/label monitoring | To monitor devices/labels on a data flow diagram, and check changes in their current values | Page 496 Monitoring devices/labels |

Analysis range

Devices/labels/constants used in the following items can be analyzed:

| Item | Remarks | |
|------------------------|---|---|
| Program | <ul style="list-style-type: none"> Ladder program ST program FBD/LD program Zoom (action/transition) in SFC program | Actions and transitions displayed in MELSAP-L (instruction format) are not analyzed. |
| Parameter | CPU parameter | Refresh setting between Multiple CPUs |
| | Module parameter | <ul style="list-style-type: none"> Refresh setting Simple CPU communication setting Simple device communication setting |
| | Parameter setting of extension modules and communication adapters | |
| AI analysis | Result of AI analysis | For details on the AI analysis, refer to the following:  Page 490 Analyzing equipment operation with AI |
| Offline monitor | Event history (offline monitor) | <ul style="list-style-type: none"> Only modify value events are analyzed. The event history displayed by using the following menu are not analyzed: [Diagnostics] ⇒ [Module Diagnostics (CPU Diagnostics)]/[System Monitor] ⇒ [Event History] |
| CPU built-in functions | | Devices/labels/constants are analyzed only in a project for an FX5CPU. |

Supported screens

The data flow analysis function is available in the following screens:

- Program editors (ladder, ST, FBD/LD, and SFC)
- Label editor
- Device list window
- Watch window^{*1}
- Intelligent function module monitor window^{*1}
- Event history (offline monitor) window^{*1}

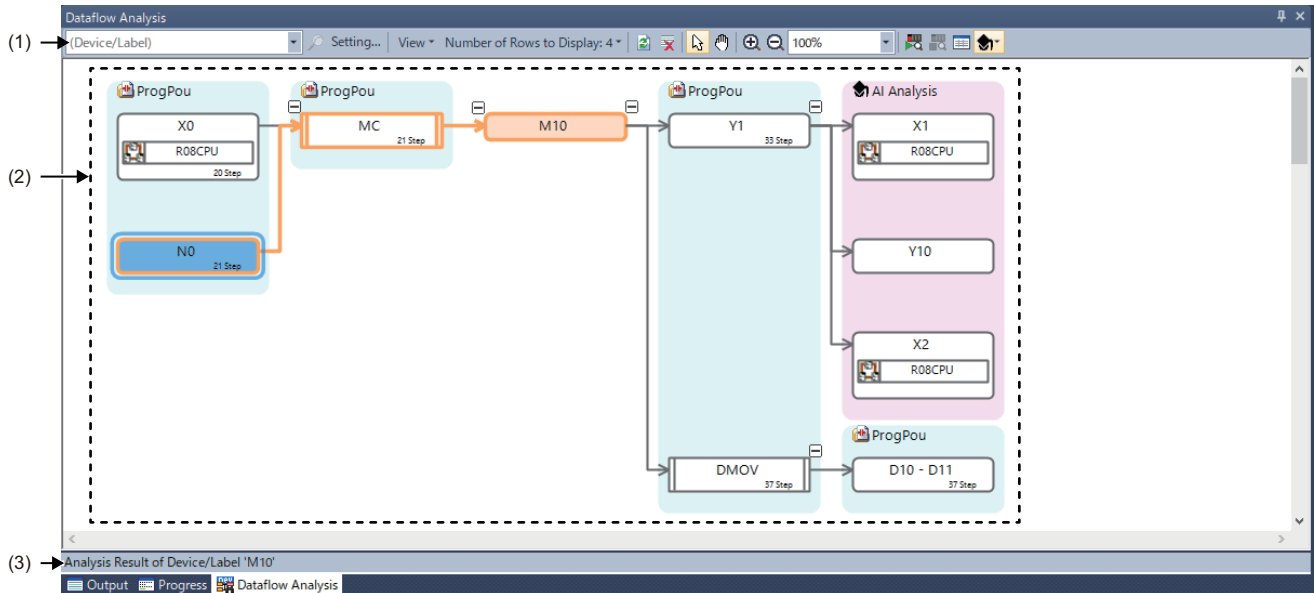
^{*1} When selecting a local label used in a function block in this window for an analysis, the label is not analyzed. To display the local label in a data flow diagram, start an analysis by specifying its label name in the "Dataflow Analysis" window.

Configuration of a data flow diagram

In a data flow diagram, an analysis target (base point) and range affected by/affecting the target are displayed graphically.

Window

Select [View] ⇒ [Docking Window] ⇒ [Dataflow Analysis] ().



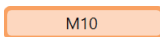
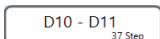
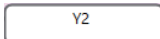




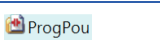
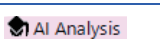
Displayed items

| Item | | Description |
|-----------------------|--|--|
| (1) Toolbar | <div> <div>(Device/Label)</div> <div>Analysis target device/label</div> </div> | Specify a device/label to be analyzed. The device/label type and range to analyze can be specified by entering a device/label to which a character string such as a program file name is appended. (Page 487 Specification method for device/label type and analysis range) |
| | Analyze | Click this to analyze a specified device/label. |
| | Setting | Select this to set an item to be included in an analysis range. |
| | View | Select this to set an item to be displayed in a data flow diagram. |
| | Number of Rows to Display | Select this to set the number of rows for a device, label, and comment displayed in a device/label block and process block. (Up to four rows) If the checkbox of "Display Device/Label and Comment" is selected in the pull-down list of the [View] menu, only the following number can be selected: <ul style="list-style-type: none"> • 2 • 4 |
| | Update | Click this to update a data flow diagram with specified analysis conditions (analysis target, setting, view, and number of rows to display). |
| | Clear All | Click this to clear an analysis result (data flow diagram). |
| | Select | Click either of the icons to switch the mouse cursor. |
| | Panning Hand | <ul style="list-style-type: none"> • Select: An element can be selected, expanded, or collapsed. In addition, the cursor can jump to a location in which the selected element is used. • Panning Hand: The display position of a data flow diagram can be moved. |
| | Zoom In | Click this to zoom in and out a data flow diagram. |
| | Zoom Out | |
| | 100% Zoom | Specify the magnification of a data flow diagram. |
| | Start Monitoring | Click this to start the monitor mode. |
| | Stop Monitoring | Click this to stop the monitor mode. |
| | Register FB Instance | Click this to specify an FB instance to be monitored. |
| | AI Analysis | Click this to analyze a logging file or recording file, and estimate physical relation among devices in equipment operation. (Page 490 Analyzing equipment operation with AI) |
| (2) Data flow diagram | | An analysis result is displayed with a data flow diagram. |
| (3) Status bar | | To display information of an analysis target. |

| Information to be displayed | |
|-----------------------------|-----|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
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| 99 | 99 |
| 100 | 100 |

■Element types

The following table shows the elements displayed in a data flow diagram.

| Element | Name | Description |
|---|--|--|
|  | Device/label block (base point) | A device/label specified as an analysis target (base point) |
|  | Device/label block (related) | A device/label/constant related to a device/label block (base point) |
|  | Device/label block (AI analysis) ^{*1} | A device/label that has physical relation with the device/label block (base point). This block is displayed when performing AI analysis. Position information of a device/label is not displayed on this block. |
|  | Process block (instruction/FUN/FB) ^{*2} | An instruction/function/function block related to a device/label block (base point) |
|  | Extended block ^{*3} | This block is displayed when the following functions affect on a device/label block (base point): <ul style="list-style-type: none"> • Event history (offline monitor)^{*4} • Parameter Example) If 'X0' is specified in any parameters, an extended block indicating the parameter is displayed in the device/label block of 'X0.' |
|  | Program block | A program block/function block/function which includes the analysis target or related item is displayed. |
|  | Program block (AI analysis) | This block is displayed on the back of a device/label block (AI analysis). |
|  | Loop | This icon is displayed when a device/label block or process block in a same location is repeated. If this icon is displayed on a block, the block cannot be expanded. Example) This icon is displayed if a same device is used for a contact and a coil. |
|  | Monitor value display area | The monitor value of a device/label is displayed when starting monitoring in the "Dataflow Analysis" window. |

*1 Not displayed for a global label specifying a constant of a local label as an array element.

*2 Not displayed for an instruction with no argument such as 'GOEND' or 'TRAN.'

*3 Not displayed for the following label/device:

- Local label used in a function block.
- Analysis target (base point) device/label with multiple definitions

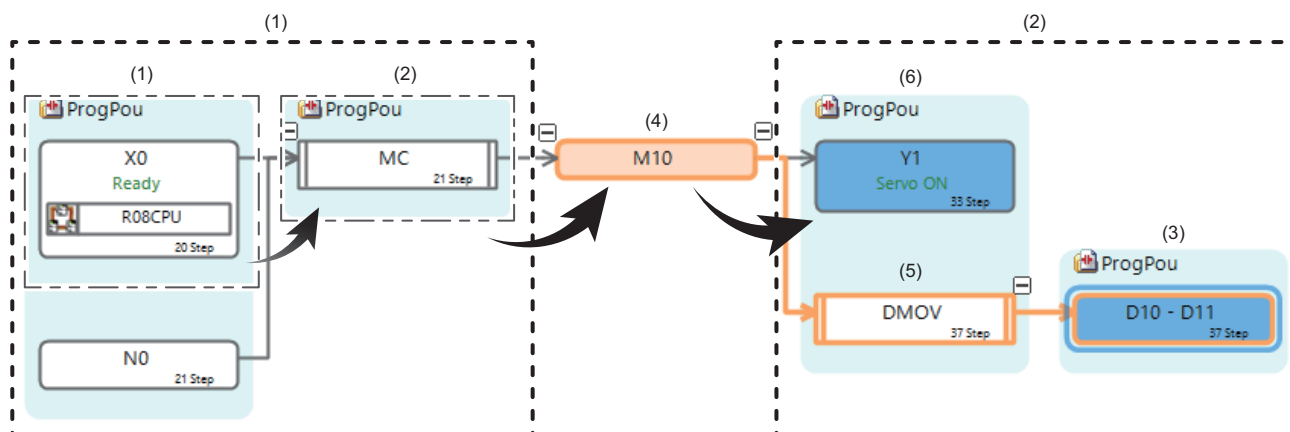
*4 An extended block is displayed only during offline monitoring which uses a recording file.

■Element layout

The following shows the layout of blocks in a data flow diagram.

In a data flow diagram, an analysis target (base point) is placed in the center, blocks (1) that affect the target are placed on the left, and blocks (2) that are affected by the target are placed on the right.

When selecting a device/label block (placing the cursor on it), the selected block (3), the base point (4), and the block (5) that is on the route between the selected block (3) and base point (4) are marked with orange frames. When selecting multiple device/label blocks, the frame is not displayed for the block (6) that is not on the route between the block (3) on which the cursor is placed and the base point (4).





Each block is placed in a data flow diagram according to the display order in the navigation window. When analyzing a device/label again after sorting data displayed in the navigation window, the layout of each block in the data flow diagram will be updated.

■Displaying comments

- For a device/label block and a process block, comments set in the following option or screen are displayed:
 - [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target"
 - [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Hierarchy Display Setting for Structures Comment"
 - "Multiple Comments Display Setting" screen

For a device/label block (AI analysis), common device comments are displayed.

- Comments which are set when an analysis starts are displayed. If a comment is edited or a setting is changed in the "Multiple Comment Display Setting" screen after the analysis starts, execute the analysis again to display the latest comments.
- Some comments may not be displayed when the following conditions are satisfied:

| Condition | Comment display |
|---|---|
| One of sequential devices is specified as an analysis target. (Example: device used in a DMOV instruction) | Only a comment set for the start device is displayed. |
| An analysis target (base point) device/label has multiple definitions. | <ul style="list-style-type: none"> Device: A common device comment is displayed. Label: A comment is not displayed. |

■Data protected by security

Data protected by security is not displayed in a data flow diagram.

Operation methods

■Selecting multiple elements

Multiple elements can be selected by any of the following operations:

- Drag the mouse cursor.
- Press the **Ctrl** + **A** keys. (To select all elements)
- Select an element, then press the **Shift** + **←** / **→** / **↑** / **↓** keys.
- Select a block with the **Ctrl** / **Shift** key held down.

■Jumping to a location in which a device/label is placed

By selecting a device/label in a data flow diagram and performing any of the following operations, the cursor jumps to a location in which the device/label is placed:

- Double-click the device or label.
- Right-click on the diagram, and select [Jump] from the shortcut menu.
- Press the **Enter** key.

Precautions



- The cursor cannot jump if the mouse cursor is (Panning Hand).
- The jump function is not available for the following items:
 - Device/label block (base point)
 - Extended block (event history (offline monitor))




- By using the following menu, the cursor jumps forward or backward from the current position to the positions where search was applied:
 - [Find/Replace] ⇒ [Previous] () / [Next] ()
- By pressing the **Shift** + **Enter** keys, jumping is possible while the cursor remains in the "Dataflow Analysis" window.

■Expanding/collapsing an element

By selecting an element in a data flow diagram and performing any of the following operations, the element can be expanded or collapsed:


- Click .
- Right-click on the diagram, and select [Expand/Collapse] from the shortcut menu.
- Press the  key.

Precautions

An element cannot be expanded or collapsed if the mouse cursor is  (Panning Hand).


■Moving to a device/label block (base point)

The cursor can move to a device/label block (base point) by any of the following operations:

- Right-click on the diagram, and select [Move to Base Point] from the shortcut menu.
- Press the  key.

■Displaying a device/label in a waveform

For the method for displaying a device/label in a waveform in GX LogViewer, refer to the following:

 Page 784 Starting GX LogViewer

Analyzing devices/labels

The following shows the procedure for analyzing devices/labels and displaying a data flow diagram.

Operating procedure

1. Select a device or label to be analyzed in a screen such as a program editor.
2. Right-click it and select [Dataflow Analysis] from the shortcut menu.

The "Dataflow Analysis" window appears, which displays an analysis result as a data flow diagram.

Point

- A data flow diagram can be displayed by pressing the **Ctrl** + **Shift** + **E** keys after selecting a device/label.
- A device/label can be analyzed from a block displayed in a data flow diagram.
Select and right-click either of the following blocks, then select [Dataflow Analysis] from the shortcut menu:
 - Device/label block
 - Process block (function block only)

Precautions

When there is no item related to a device/label which is specified as an analysis target, a data flow diagram is not displayed.

Specification method for device/label type and analysis range

By entering a device name or label name, to which a character string such as a program block name is appended, in the input field, the type and analysis range of the label/label to be analyzed can be specified.

When entering a device name or label name, refer to the following example.

| Example name | | Type of device/label to be analyzed | Analysis range |
|-------------------------------------|------------------|-------------------------------------|--|
| Label name | bLabel1 | Global label | Entire project |
| Program block name/label name | ProgPou/bLabel1 | Local label | Program block whose name is the same as the entered one |
| Function block name/label name | FbPou/bLabel1 | | Function block whose name is the same as the entered one |
| Function name/label name | FunPou/bLabel1 | | Function whose name is the same as the entered one |
| Program file name/label name | MAIN/bLabel1 | | Program file whose name is the same as the entered one |
| FB file name/label name | FBFILE1/bLabel1 | | FB file whose name is the same as the entered one |
| FUN file name/label name | FUNFILE1/bLabel1 | Global label*1 Local label | FUN file whose name is the same as the entered one |
| /Label name | /bLabel1 | Global label | Entire project |
| Local device name | #D10 | Local device | Entire project |
| Program file name/local device name | MAIN/#D10 | | Program file whose name is the same as the entered one |
| FB file name/local device name | FBFILE1/#D10 | | FB file whose name is the same as the entered one |
| FUN file name/local device name | FUNFILE1/#D10 | | FUN file whose name is the same as the entered one |

*1 Not analyzed if a function is created in Ladder Diagram language.

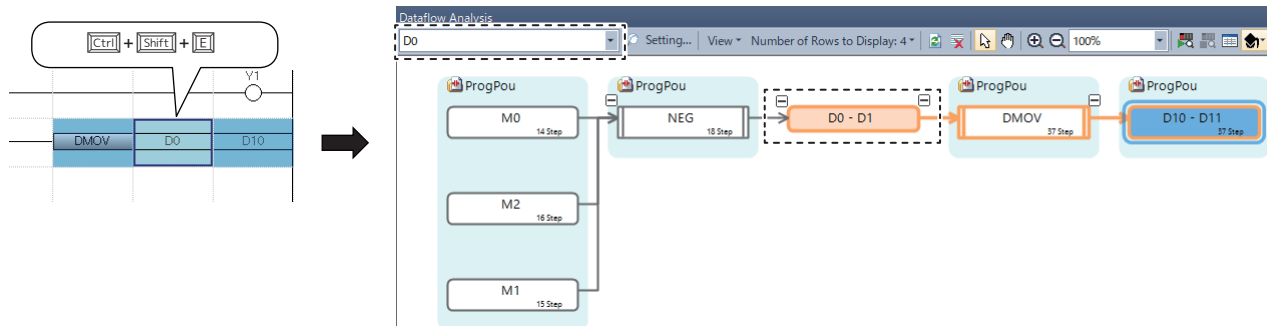
■Specification method for device range to be analyzed

When analyzing a device from a program editor, the device can be analyzed with the range which it uses.

(Example: When analyzing a device used in a DMOV instruction, the device range used as an argument is handled as two words.)

Ex.

Analyzing a device (D0-D1) used in a DMOV instruction



Analysis of an index-modified device

Only during offline monitoring, an index-modified device is analyzed with the device value to which the index value is applied. The following table shows the combinations of index modifications and analysis examples of index-modified devices.

| Combination of index modifications | | | Device example | Analysis example (when the value of Z0 is '1') |
|------------------------------------|------------------------|--------------------|----------------|--|
| Index modification | — | — | X0Z0 | X1 |
| | | | #M0Z0 | #M1 |
| | | | D0Z0 | D1 |
| Index modification | Digit specification | — | K4M0Z0 | K4M1 |
| | | | K4#M0Z0 | K4#M1 |
| Index modification | Bit specification | — | D0Z0.0 | D1.0 |
| Index modification | Indirect specification | — | @D0Z0 | @D1 |
| Bit specification | Index modification | — | D0.0Z0 | D0.1 |
| Index modification | Indirect specification | Bit specification | @D0Z0.0 | @D1.0 |
| Indirect specification | Bit specification | Index modification | @D0.0Z0 | @D0.1 |

Precautions

- When analyzing the following data, the value of an index register is not applied to the device value:
 - Device modified with a local index register
 - Index-modified device used as an array element of an array type label
 - 32-bit index modification with ZZ expression
 - Index register (Z, LZ, ZZ)
- '-' (A hyphen) is displayed if a device cannot be analyzed with the device value to which the index value is applied.

Unanalyzable device/label

- In a ladder program, a ladder in which a conversion error has occurred cannot be analyzed.
- Some devices/labels cannot be analyzed if the following devices/labels are specified:

| Specified device/label | Unanalyzable device/label/constant |
|---|--|
| Bit-specified device/label | Device/label a bit of which is not specified |
| Local label in a function block or structure member | FB instance or structure type label name |
| Digit-specified device/label | Device/label the digits of which are not specified |
| Label including an array element | Label which does not completely match with the one in a program |
| — | <ul style="list-style-type: none"> • Device/label specified as an array element • Device/label/constant used in a conditional expression of control syntax in a ST program |

Considerations

■When including an event history (offline monitor) in the analysis range

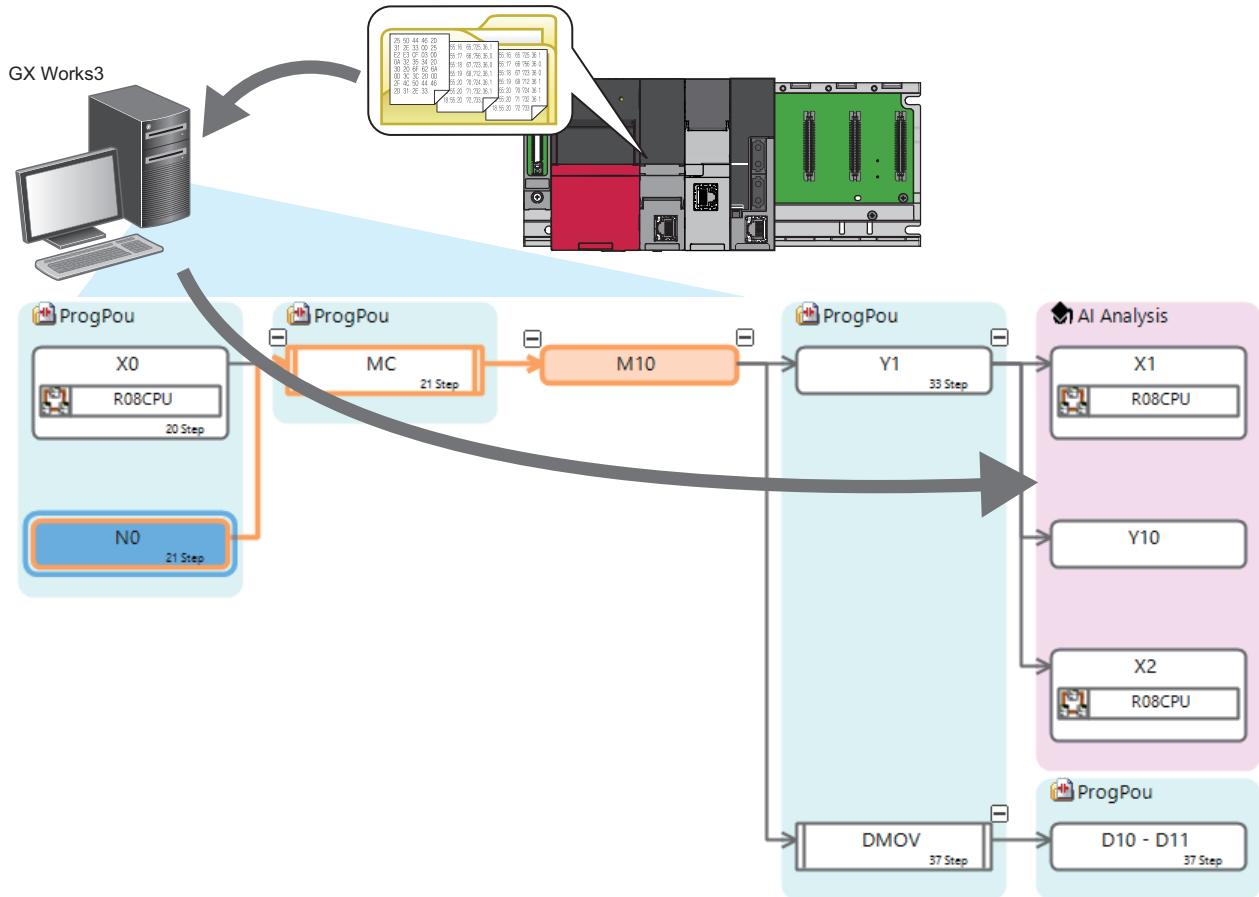
Note the following when including an event history (offline monitor) in the analysis range:

- Use a project written to a programmable controller. An extended block may not be displayed correctly if an analysis is executed with the following projects: a project different from the one written in the programmable controller, and a program in which a label assignment is changed.
- An extended block is not displayed when analyzing a local label of a function block.

Analyzing equipment operation with AI

The AI analysis is a function to estimate physical relation among devices in equipment operation by analyzing data collected from a programmable controller, and display it in a data flow diagram. When an error occurs, the cause can be identified easily by checking the estimated physical relation among devices.

R00CPU, RnPSFCPU, and remote head modules do not support this function.

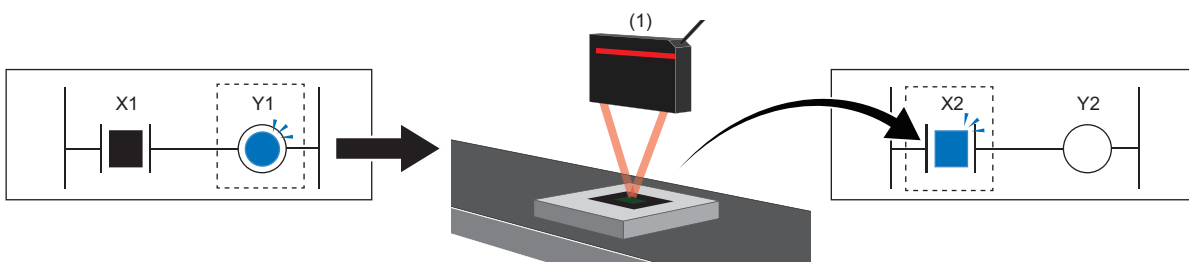


Ex.

The following shows an example of physical relation among devices in equipment operation.

Y1 turns ON and a conveyor operates. When a sensor (1) detects a work piece, X2 turns ON.

In this case, Y1 and X2 have physical relation.



If Y1 and X2 do not have relation in a program, their relation are not displayed in a data flow diagram even when analyzing devices/labels.

By performing the AI analysis, physical relation such as Y1 and X2 can be displayed in a data flow diagram.

Precautions

The AI analysis is a function to estimate the relation among devices by using data of a programmable controller, and does not guarantee that the analysis result displayed in a data flow diagram is correct.

Operating procedure

1. Analyze data collected from a programmable controller. (📖 Page 492 Analyzing collected data)
2. Perform the data flow analysis to display a data flow diagram. (📖 Page 487 Analyzing devices/labels)

Point

- The checkbox of the following item is automatically selected after performing the AI analysis:
[Setting] on the toolbar ⇒ "AI Analysis"
To hide the result of AI analysis, unselect the checkbox and perform the data flow analysis.
- A result of the AI analysis can be applied to a data flow diagram also by importing the result. (📖 Page 493 Importing an analysis result)

Target data

The following data, collected from a programmable controller, is used in the AI analysis.

| Target data | Function | Reference |
|-----------------------------------|-----------------------|--------------------------------|
| Recording file | Recording function | Page 759 Recording Function |
| Logging file in the binary format | Data logging function | Page 756 Data Logging Function |

If the target data does not satisfy the following conditions, the AI analysis may not be performed properly.

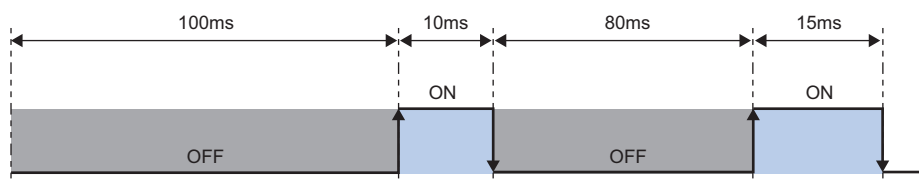
| Importance level | Condition |
|-------------------------|---|
| Required condition*1 | The system runs normally while collecting data to be analyzed. |
| Recommended condition*2 | <ul style="list-style-type: none"> • Bare minimum of devices/labels are specified as sampling targets. • Sampling time is between 10 to 30 cycles.*3 • The sampling interval is equal to or less than the minimum value of time taken for a target device/label to turn from ON to OFF or OFF to ON.*4 |

*1 If the condition is not satisfied, a proper analysis result cannot be obtained.

*2 If the condition is not satisfied, the AI analysis may take time or a proper analysis result may not be obtained.

*3 One cycle refers to the time taken for the target project to operate once.

*4 The following chart shows an example of the time taken for a target device/label to turn from ON to OFF or OFF to ON. In this case, the recommended sampling interval is 10 ms or less.



Devices/labels that can be analyzed

Devices/labels that satisfy the following conditions can be analyzed in the AI analysis:

- It exists in the recording file/logging file to be analyzed.
- It is used in a program in the project.

The following devices can be analyzed:

| Type | Device |
|---------------|--------------|
| Device | X, Y, DX, DY |
| Safety device | SAIX, SAIY |

For labels, global labels to which an input (X) or output (Y) is assigned can be analyzed.

Precautions

The following data is not analyzed in the AI analysis:

- Global label specifying an element other than constants as an array element.
- Device/label used in an unconverted function block or a function block that is not used in a program
- Device/label used in a function

■Considerations for recording setting/data logging setting

When collecting target data of the AI analysis by using the recording function or data logging function, configure a recording setting or data logging setting as follows:


- Specify devices/labels to be analyzed as sampling targets.
- For a logging file, select the checkbox of "Output date" in the data logging setting.


Analyzing collected data

Operating procedure




Open a project used for the recording function or data logging function in advance.

Using a project when the target data is collected is recommended.

1. Click  (AI analysis) on the toolbar.
2. Select "AI Analysis."
3. Click the [Browse] button in "Recording/Logging File."
4. In the displayed screen, select a logging file or recording file and click the [Open] button.
5. Select the checkbox of "Export the analysis result" in "Export Destination of Analysis Result."
6. Click the [Browse] button.
7. Enter the name of a file to be exported in the "Export Analysis Result" screen.
8. Click the [Save] button.
9. Click the [Start Analysis] button.
10. After the analysis is completed, perform the data flow analysis.

When a data flow diagram is displayed, click  (Update) on the tool bar.

Point

- GX Works3 can be operated even during analysis.
- Predicted time remaining for analysis can be checked in a dialog displayed during analysis. ( Page 492 Time required for the AI analysis)
- An analysis result can also be exported later. ( Page 493 Exporting an analysis result)
- When there are 5000 or more target devices/labels, the time taken for analysis can be reduced by specifying the devices/labels to be actually analyzed. ( Page 494 When there are 5000 or more target devices/labels)

■Time required for the AI analysis

Analyzing data may take time when the number of devices/labels to be analyzed is large.

Predicted time remaining for analysis can be checked in a dialog displayed during analysis.

Remaining time is predicted based on the following operating environment.

| Item | Description |
|------------------|---|
| CPU | Equivalent to Intel® Core™ i7 or higher |
| Required memory | 8 GB or more |
| Operating system | 64-bit version |

Note that the actual time may differ from the predicted time depending on the operating environment.

Exporting/importing an analysis result

A result of the AI analysis can be exported to a CSV file.

In addition, a result of the AI analysis can be applied to a data flow diagram by importing it from the CSV file.

■File format

The following shows the configuration of a CSV file.


| | |
|---|--|
| ① | 1 |
| ② | C:\PC\Desktop\SampleGXWorks3\Recorder\1TS01_001\record.melrc |
| ③ | 2024/01/17 10:00:00 |
| | X100 1 Y100 Y200 X200 Y102 Y221 X102 X221 Y101 Y220 X101 |
| | X100 2 Y100 Y200 X200 X101 X220 Y101 Y220 X102 X221 Y102 |
| | Y221 2 Y102 X102 X221 X100 X200 Y100 Y200 X101 X220 Y101 |
| ④ | |
| ⑤ | |
| ⑥ | |

| No. | Item | Description |
|-----|------------|---|
| ① | ver | The version information of an exported CSV file is displayed. |
| ② | filename | The path to an analyzed recording file or logging file is displayed. |
| ③ | updatedate | The update date and time of an analyzed recording file or logging file is displayed. |
| ④ | target | Analyzed devices/labels are displayed. |
| ⑤ | direction | Either of the following values is displayed: • 1: When "target" is affected by "rank" • 2: When "target" affects "rank" |
| ⑥ | rank | According to the result of AI analysis, devices/labels are arranged from the most relevant on the left. |

■Exporting an analysis result

A result of the AI analysis can be exported to a CSV file.


Operating procedure

1. Click  (AI analysis) on the toolbar.
2. Select "Export Analysis Result."
3. Enter the name of a file to be exported in the "Export Analysis Result" screen.
4. Click the [Save] button.

■Importing an analysis result

A result of the AI analysis can be imported from a CSV file.

Operating procedure

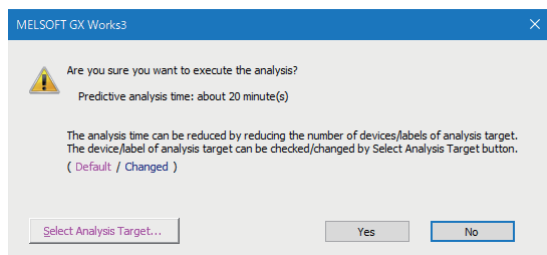
1. Click  (AI analysis) on the toolbar.
2. Select "Import Analysis Result."
3. Select a file (*.csv) to import a result and click the [Open] button.

Precautions

Data may not be imported properly if a CSV file to be imported is edited.

When there are 5000 or more target devices/labels

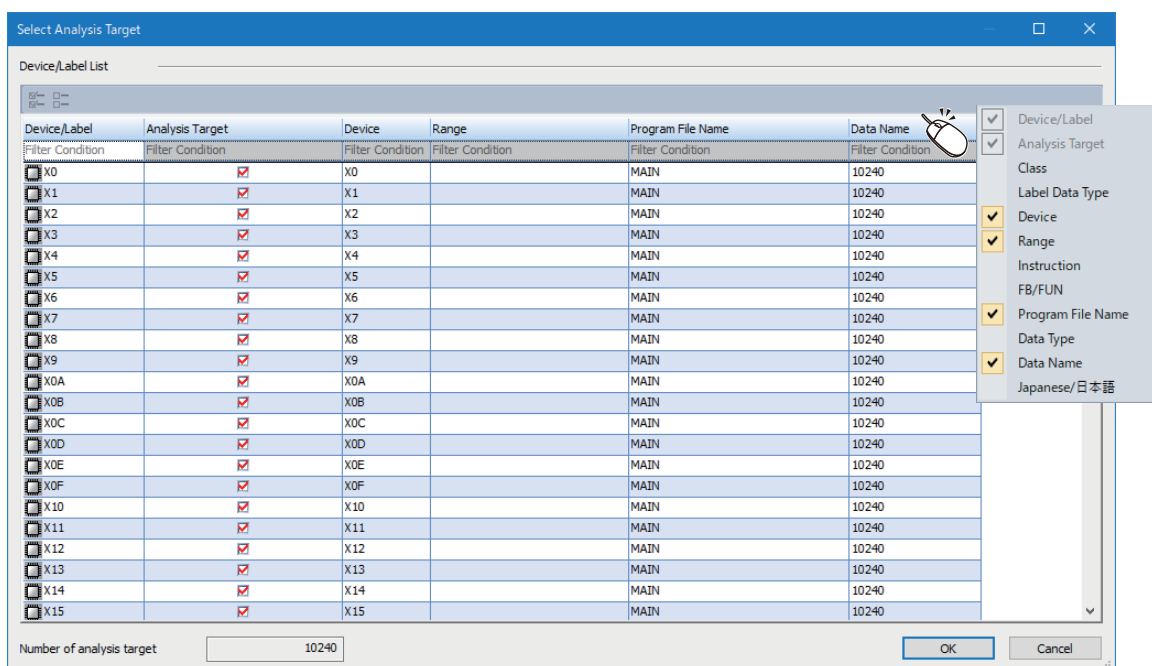
When there are 5000 or more target devices/labels, the predicted time for analysis is displayed in the confirmation screen after clicking the [Start Analysis] button.



By specifying devices/labels to be actually analyzed, the time taken for analysis can be reduced.

Window

Click the [Select Analysis Target] button in the confirmation screen for the predicted time.



Operating procedure

1. Select the checkbox of a device to be analyzed in the "Analysis Target" column.
2. Click the [OK] button.
3. Click the [Yes] button in the confirmation screen for the predicted time to start an analysis.


Point

- Devices/labels that are set as sampling targets in the recording file/logging file and also are used in a program of the open project are displayed.
- Items can be shown or hidden in the menu displayed by right-clicking each column header.
- After selecting rows, their checkboxes of "Analysis Target" can be selected or unselected in a batch by the following operation:
Right-click and select [Set the Selected Rows as Analysis Target]/[Deselect the Selected Rows as Analysis Target] from the shortcut menu.

■Filtering display

Device/label information displayed in the "Select Analysis Target" screen can be filtered.

Operating procedure

- Enter or select a filtering condition, and press the  key.
- Filtering of a column can be cleared by deleting the keyword entered as a filtering condition for the column.
- The following table shows the wild cards that can be set as keywords in filtering conditions to search for a character string.

Ex.

When setting a filtering condition for the device/label column

| Wild card | Target | Example | Search result |
|-----------|--|------------|--------------------------------|
| * | Any character string | *D30* | red301, @D30, XD30, D30, D30:U |
| ? | Any one character | K4?30 | K4X30, K4Y30 |
| [] | Any one of specified characters | [XY]8 | X8, Y8 |
| [!] | Any one character except for one in the brackets | K4X[!3]0 | K4X10, K4X20, K4X40 |
| | | K[!1-3]X0 | K4X0 |
| [-] | Character strings within the range in the brackets | [B-D]0 | B0, C0, D0 |
| | | D[0-2] | D0, D1, D2 |
| | | K4X[!3-4]0 | K4X10, K4X20, K4X50 |



The previously entered keywords can be selected from the pull-down list.

Precautions

In the following cases, information may not be filtered properly.

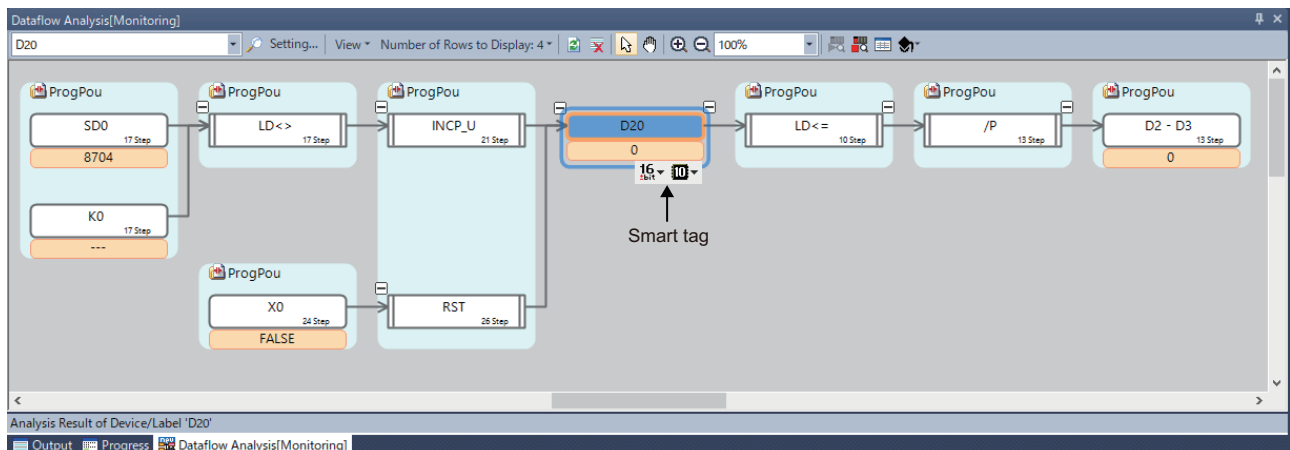
- An array element is specified as a filtering condition.
- A data type including "[]" is specified as a filtering condition.
- A comment includes a wild card.

■Sorting display

The columns can be sorted in ascending/descending order by clicking the column header.

Monitoring devices/labels

Devices/labels displayed with a data flow diagram can be monitored, and changes in their current values can be checked.



Starting/stopping monitoring

By starting monitoring, the monitor values of analyzed devices/labels can be displayed in a data flow diagram.

■ Starting monitoring

Operating procedure

Right-click on a data flow diagram and select [Monitor] ⇒ [Start Monitoring] from the shortcut menu.

■ Stopping monitoring

Operating procedure

Right-click on a data flow diagram and select [Monitor] ⇒ [Stop Monitoring] from the shortcut menu.

Point

When selecting a program with the specified program monitor function, the values after the selected program was executed are displayed as the monitor values. In this case, "[Monitoring (Running Specified Program Monitor)]" is added to the title of the "Dataflow Analysis" window.

For details on the specified program monitor function, refer to the following:

☞ Page 633 When monitoring devices/labels in a specified program

Precautions

- If a device/label block satisfies either of the following conditions, its monitor value is not displayed:
 - Local label used in a macro type function block or in a program body of a FUN
 - Local device used in an unregistered program or in a program body of an FB/FUN
- When a device/label cannot be monitored, an indefinite value or "----" is displayed in the monitor value display area.
- If an index-modified device is displayed in either of the following data display formats, an indefinite value is displayed in the monitor value display area:
 - 64-bit Integer [Signed]
 - 64-bit Integer [Unsigned]
- For sequential devices, only the monitor value of start device is displayed.

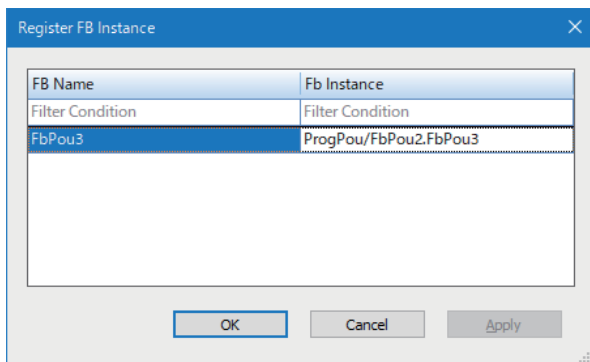
Displaying the monitor value of an FB instance

The monitor value of a local label used in a program body of a subroutine type function block can be displayed by specifying an FB instance to be monitored in the "Register FB Instance" screen.

Window

Double-click a program block of a function block on a data flow diagram.

Alternatively, right click it and select [Monitor] ⇒ [Register FB Instance] from the shortcut menu.



Operating procedure

1. Select an FB instance to display its monitor value, and click the [Apply] button.
2. Click the [OK] button.

■Filtering display

The list of FB instances displayed in the "Register FB Instance" screen can be filtered.

Operating procedure

Enter or select a filtering condition, and press the Enter key.

To clear filtering, delete the keyword entered as a filtering condition.

Point

The previously entered keywords can be selected from the pull-down list.

Setting the display format

The display format (data display format, display value) of a monitor value can be set for each of the displayed word devices and double-word devices.

Operating procedure

1. Select a device/label block of a word device or double-word device.
2. Click either of the following smart tags to set the display format:
 - Data Display Format (16-bit)
 - Display Value (10-bit)

Precautions

- The display format settings are saved in a project and not written to a programmable controller.
- Up to 10,000 display format settings can be retained. If the number of settings exceeds 10,000, they will be deleted in chronological order. However, note that if there are any data display format settings imported from a CSV file, the settings will be deleted from the one in the bottom row of the CSV file.

■Exporting the data display format

The data display formats of monitor values can be exported to a CSV file.
Only the data display formats the settings of which have been changed are exported.
A saved CSV file opened in spreadsheet software is displayed as follows:

| //Start Device | Points | Data Type | (1) |
|----------------|--------|-----------|-----|
| D0 | 5 | DINT | |
| J1 ¥WO | 2 | REAL | (2) |
| T3 | 1 | LREAL | |

- (1): Header
(2): Data segment

- The following describes the detailed formats of a file.
- The file format is Unicode (UTF-16 Little Endian with BOM).
 - Items are delimited by '\t' (a tab).
 - Each item is enclosed with " (double quotes).
 - When " (a double quote) is included in an item, "" (two double quotes) are displayed for each " (double quote) in the item.
 - A line feed is inserted at the end of a row. The line feed code is LF.
 - Item names in the header (1) are exported in a language set for the display language of GX Works3. (Page 49 Display Language Switching)

Operating procedure

Right-click on the data flow diagram, and select [Monitor] ⇒ [Device Data Type Setting] ⇒ [Export to File] from the shortcut menu.

■Importing the data display format

The data display formats for monitor values can be imported from a CSV file.

For a CSV file to be imported, follow the formats listed below:

- The header (1) is not mandatory.
- Use '\t' (a tab) for delimiting items.
- Add '/' (two slashes) at the head of the first column in a row to not be imported.
- Notation in the "Data Type" column is as follows:

| Data display format to be set | Notation |
|---|----------|
| 16-bit Integer [Signed] | INT |
| 16-bit Integer [Unsigned] | WORD |
| 32-bit Integer [Signed] | DINT |
| 32-bit Integer [Unsigned] | DWORD |
| 64-bit Integer [Signed] ^{*1} | QINT |
| 64-bit Integer [Unsigned] ^{*1} | QWORD |
| FLOAT [Single Precision] | REAL |
| FLOAT [Double Precision] ^{*1} | LREAL |
| String | STRING |
| String [Unicode] | WSTRING |

^{*1} Cannot be imported in an FX5CPU.

Devices that can be imported are as follows:

| Device |
|---|
| T ^{*1} , ST ^{*1} , LT ^{*1,2} , LST ^{*1,2} , C ^{*1} , LC ^{*1} , D, W, SW, SD, J□W ^{*2} , J□SW ^{*2} , U□G, U3E□G ^{*2} , U3E□HG ^{*2} , Z, LZ, R, ZR ^{*2} , RD ^{*2} |

^{*1} Imported as the current value information.

^{*2} FX5CPUs do not support it.

Operating procedure

Right-click on the data flow diagram, and select [Monitor] ⇒ [Device Data Type Setting] ⇒ [Import File] from the shortcut menu.

Precautions

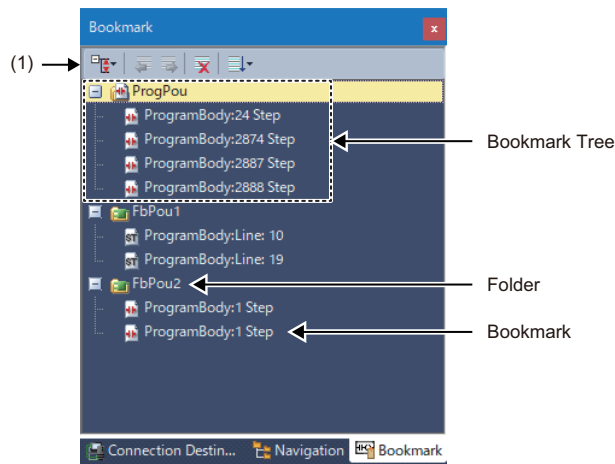
- A CSV file with more than 10,000 rows of data cannot be imported.
- When different data types are set for one device in multiple rows, the setting in the most upper row in the CSV file is imported.

9.9 Registering a Bookmark

The bookmark function registers position information of a program in a project. Specific data in a program can be referenced to quickly by using a bookmark.

Window

Select [View] ⇒ [Docking Window] ⇒ [Bookmark] (🔖).



Displayed items

| Item | | Description |
|-------------|--|--|
| (1) Toolbar | Expand/Collapse Tree | To expand or collapse a bookmark tree. |
| | Jump to Previous Bookmark (in Execution Order) | To jump to the bookmark that is previous to a selected one in the execution order. |
| | Jump to Next Bookmark (in Execution Order) | To jump to the bookmark that is next to a selected one in the execution order. |
| | Clear All | To clear all registered bookmarks. |
| | Sort | To sort bookmarks in each folder by name or execution order. |

Registering a bookmark

Position information of a program can be registered in a project. Up to 100 bookmarks can be registered.

Operating procedure

Right-click on any of the following screens, and select [BookMark] from the shortcut menu.


- Ladder editor
- Inline structured text box in a ladder editor
- ST editor
- FBD/LD editor
- Inline structured text element in an FBD/LD editor
- Dataflow analysis window

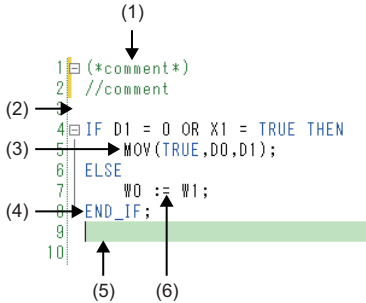
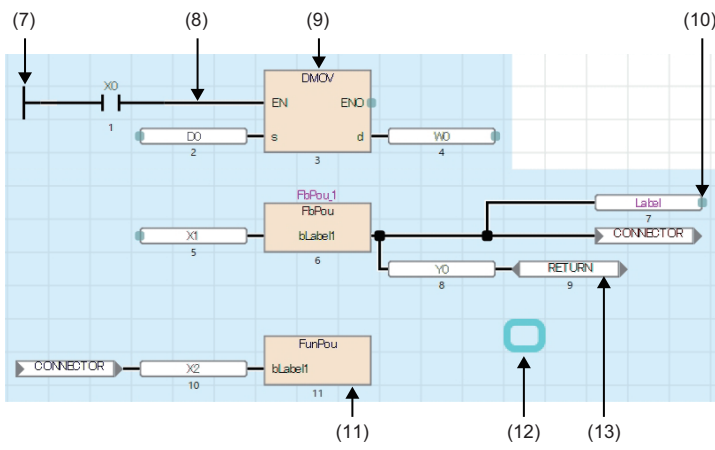
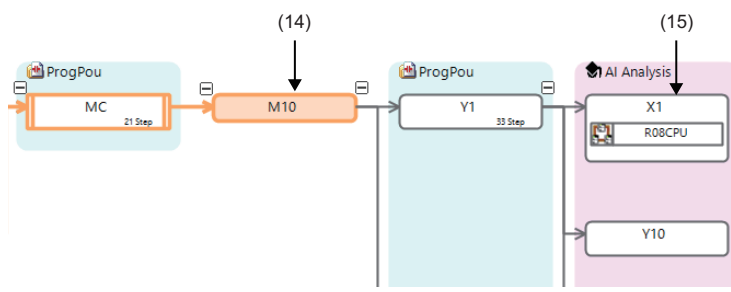
Point

- A bookmark can also be registered by selecting [Find/Replace] ⇒ [Bookmark].
- Position information of a Zoom (action/transition) in an SFC program can also be registered; however, excluding an action/transition displayed in MELSAP-L (instruction format).

Precautions

A bookmark cannot be registered if any of the following conditions is satisfied:

- The position information of a target is already registered as a bookmark.
- 100 bookmarks are already registered.
- The mouse cursor in the "Dataflow Analysis" window is  (Panning Hand).
- A registration was attempted in any of the following locations:


| Screen | location where the operation was attempted | |
|----------------------------|--|--|
| ST editor | (1) Comment |  |
| | (2) Blank row | |
| | (3) Instruction | |
| | (4) Instruction template (example: END_IF) | |
| | (5) Blank where no token exists | |
| | (6) Expression | |
| FBD/LD editor | (7) Left power rail |  |
| | (8) Connection line | |
| | (9) Element | |
| | (10) Input/output connection point of the following elements: • LD element • Variable element • Constant element • Jump element • Connector element • Return element | |
| | (11) FunPou | |
| | (12) Location where no element exists | |
| "Dataflow Analysis" window | (14) Device/label block (base point) |  |
| | (15) Device/label block (AI analysis) | |

Jumping to a program

The cursor can jump to a program position that is registered as a bookmark.

Operating procedure

Select a bookmark, then perform any of the following operations:


- Double-click the bookmark.
- Right-click the bookmark, and select [Jump] from the shortcut menu.
- Press the  key.

Deleting a bookmark

A bookmark can be deleted from a project.

Operating procedure

Select a bookmark or folder, then perform either of the following operations:


- Right-click the bookmark, and select [Delete] from the shortcut menu.
- Press the  key.

Changing a bookmark name

A bookmark name can be changed from the default (program name + position information).

Operating procedure

Select a bookmark, then perform either of the following operations:

- Right-click the bookmark, and select [Change the Bookmark Name] from the shortcut menu.
- Press the  key.

Considerations

■Editing or converting a program after bookmark registration

If a program is edited or converted after bookmark registration, position information registered as a bookmark will not be matched with the program. To update the bookmark, delete and register the bookmark again.

■Changing the module type and operation mode

If a new project is created due to the series change in changing the module type and operation mode of a project, bookmarks registered in the previous project will be deleted.

10 SEGMENTING PROGRAMS

By segmenting a process program which is used repeatedly in a program into an element, it can be used in a sequence program.

Efficient program development reduces a program error, thus program quality will be improved.

A segmented program file is referred to as 'POU' (☞ Page 102 Data configuration).

Besides, multiple POUs can be collected into a different file from a project. The file is referred to as 'library.'

POU

There are two types of POUs which can repeatedly be used; function blocks and functions.

Remote head modules do not support them.

■Function block

'Function block' is a program component (POU) created by segmenting a program, which outputs an operation result in accordance with a value of the internal memory and an input value, into components.

It is classified into the following three types.

| POU | Description | Reference |
|--------------------------------|---|---|
| Function block | A function block which is created by a user. In projects for an RnPCPU (process mode/redundant mode) and an RnPSFCPU, a function block in which the process control processing of a manufacturer-defined tag FB is customized (user-defined tag FB) can be created. | Page 505 Creating a Function Block Page 518 Creating a user-defined tag FB |
| Standard function block | A function block which can be used in general. It is prepared in GX Works3 in advance. | Page 58 Element selection window |
| Process control function block | A function block for process control. It can be used in the following programs. It is prepared in GX Works3 in advance. In addition, process control function blocks can be used in the following program. <ul style="list-style-type: none">• FBD/LD program for process control• FB program of a function block placed in an FBD/LD program (FBD/LD program)• FB program of a user-defined tag FB placed in an FBD/LD program (FBD/LD program) | Page 58 Element selection window |
| Module FB | A function block which is created by segmenting a dedicated processing for a module. It is prepared in GX Works3 in advance. | Page 521 Using a module FB |

■Function

'Function' is a program component (POU) created by segmenting a program, which has no internal memory and outputs the same operation result to the same input value always.

It is classified into the following two types.

| POU | Description | Reference |
|-------------------|--|----------------------------------|
| Function | A function which is created by a user | Page 525 Creating a Function |
| Standard function | A function which can be used in general. It is prepared in GX Works3 in advance. | Page 58 Element selection window |

Library

'Library' is an element collection of multiple POU's and structures. Elements in a library can be used in multiple projects.

■User library

'User library' is an element collection which is composed of created POU's and structures.

For details, refer to the following:

☞ Page 527 Enhancing Use of User Library

■Application library/MELSOFT Library (sample library)

'MELSOFT Library' (Sample Library) is an element collection provided by a manufacturer.

To obtain the application library/sample library (MELSOFT Library), please contact your local Mitsubishi Electric sales office or representative.

For details, refer to the following:

☞ Page 536 Enhanced Use of Application Library/MELSOFT Library

Remote head modules do not support this library.

10.1 Creating a Function Block

This section explains the method to create a sequence program using function blocks.

Function blocks

For details on function blocks, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

10

Procedure to use

■Creating a new function block

1. Create new function block data. (📖 Page 506 Creating new data)
2. Register a local label to use in a program body of a function block. Up to 5120 local labels can be registered in a function block. (📖 Page 507 Setting labels)
3. Create a program body by using a label. (📖 Page 507 Creating a program)
4. Paste a function block into a sequence program.
(Ladder program: 📖 Page 284 Inserting a function block, ST program: Page 324 Inserting a function block)

■Creating a function block from an existing ladder block

A function block can be created by selecting a ladder block in a program editor. (📖 Page 510 Creating a function block from an existing ladder block)

A created function block is automatically inserted in a sequence program.

This method is supported only in a ladder program.

Creating a new function block

The following explains the method to create a new function block.

For the number of creatable function blocks, refer to the following:

☞ Page 131 Maximum number of units of data that can be created in one project (RCPU/LHCPU/FX5CPU)

However, the maximum number of data that can be created may not be reached depending on the configuration of FB files and FUN files.

Creating new data

A function block data can be created in a project on the "New Data" screen.

| Item | | | Description |
|----------------|-------------------|--|---|
| Detail Setting | Inherent Property | Use MC/MCR to Control EN ^{*1} | For "Yes," the MC/MCR instructions are used to control 'EN.' For "No," the CJ instruction is used to control 'EN.' Select "Yes" when the raising/falling instructions are used in an FB. The operations of a timer/counter and the OUT instruction used in an FB differ depending the selected item. For details, refer to the following: ☞ MELSEC iQ-R Programming Manual (Program Design) ☞ MELSEC iQ-F FX5 Programming Manual (Program Design) |
| | | Use EN/ENO | For "Yes," a function block with EN/ENO is created, and EN/ENO labels can be used in a program without registering as local labels. For "No," a function block without EN/ENO is created. For details on EN/ENO, refer to the following: ☞ MELSEC iQ-R Programming Manual (Program Design) ☞ MELSEC iQ-F FX5 Programming Manual (Program Design) |
| | FB File | FB File of Add Destination | Select a storage destination file of a function block to be created. A new storage destination file can be created by entering a file name directly. |
| | | FB Type | For "Macro Type," the program body of a function block is stored in an FB file that will be the storage destination of the call source program block or program body of the function block. For "Subroutine Type," the program body of a function block is stored in an FB file. |

*1 For the conditions under which "Yes" can be selected, refer to the following:

☞ Page 506 Conditions to select "Yes" for "Use MC/MCR to Control EN"

■Conditions to select "Yes" for "Use MC/MCR to Control EN"

When all of the following conditions are applied, "Yes" can be selected for "Use MC/MCR to Control EN."

| Condition | |
|-----------|--|
| 1 | "Yes" is selected for "Use EN/ENO." |
| 2 | Any of the following settings is set. <ul style="list-style-type: none">• "Macro Type" is selected for "FB Type."• "Yes" is selected for the following option and "Subroutine Type" is selected for "FB Type." [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Use MC/MCR to Control EN" |
| 3 | A CPU module and GX Works3 supporting this setting are used. For the versions supporting this setting, refer to the following: ☞ MELSEC iQ-R CPU Module User's Manual (Application) |

Precautions

- If the function block in which the MC/MCR instruction is used is not executed, the outputs and the current values of timers in the function block will be reset. (If the instruction is not used, the current values are retained).
- When "Yes" is selected for "Use MC/MCR to Control EN," the system uses 'N0' (nesting) for MC/MCR instructions in an FB. Therefore, do not use 'N0' for the MC/MCR instructions in the same FB.

Setting labels

Set a label to use in a program body on a label editor.


The operations in the editor are the same as that in other label editors. For details, refer to the following:

 Page 235 Registering Labels

Operating procedure

Select "FB/FUN" ⇒ "(file name)" ⇒ "(FB)" ⇒ "Local Label" in the navigation window.

Precautions

Do not assign the instance of a function block to an alias. ( Page 238 Alias)

Creating a program

Create the program body of a function block by using labels.

Both local labels and global labels of a function block can be used.

The method for entering programs is the same as that of each program.

Operating procedure

1. Select "FB/FUN" ⇒ "(file name)" ⇒ "(FB)" ⇒ "ProgramBody" in the navigation window.
2. Configure the programs.

Changing the type of a function block

Change the type of a function block (macro type/subroutine type).

Operating procedure

1. Select "FB/FUN" ⇒ "(file name)" in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Properties].
3. Set the type of the function block for "FB Type" in the "Properties" screen, and click the [OK] button.

Setting reserved area capacities

Set the reserved area capacities of FB instances for each function block.

To apply the set reserved area capacities for programs, all the programs are required to be converted (reassigned).

For details on reserved area capacities, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Operating procedure

1. Select "Yes" for the following option.
[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Set Reserved Area"
2. Select "FB/FUN" ⇒ "(file name)" ⇒ "(FB)" in the navigation window.
3. Select [Project] ⇒ [Data Operation] ⇒ [Properties].
4. Set a reserved area capacity for "Label Reserved Area," "Latch Label Reserved Area," or "Signal Flow Reserved Area," then click the [OK] button in the "Properties" screen.
5. Convert (reassign) all the programs.

Precautions

- In a project for an FX5CPU, the reserved area capacities of function blocks cannot be changed.
- Only for subroutine type function blocks, the reserved area capacity for "Signal Flow Reserved Area" can be set.

Converting function blocks

- Function blocks (POUs) will not be converted even if a conversion was attempted as long as FB instances have not been created, or FB instances have been created only in unregistered programs.
- When a function block is edited, all the programs in which the FB file and the function block are used will be in unconverted state.

■ When editing only the program body of a subroutine type function block

By setting the following option, only the edited FB program or FB file will be in the unconverted state.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Convert, Online Program Change Target Setting"

When an unconverted function block is converted after changing the option from "High-speed" to "Low-speed," a POU including the function block is also converted.

Precautions

If the option is set to "High-speed" and any one of the following instruction is used in a subroutine type function block, a conversion error may occur. A conversion is successfully completed by converting the program again or performing the online program change.

- Rising instruction
- Falling instruction
- SCJ instruction
- STMR instruction

Considerations when creating FB programs

■Use of devices

Using labels is recommended for creating FB programs.

If an FB program which uses devices (X10, Y10, etc.) is used at multiple locations, the program may not operate normally. In addition, if an FB program which uses devices for the OUT instruction is used at multiple locations, duplicated coil is resulted. Duplicated coil can be avoided with the SET/RST instruction.

■When using master control instructions

When using a master control instruction in an FB program, use the MC instruction and the MCR instruction together.

■When using function blocks for a sequence program to be executed multiple times in a single scan

If a function block, which contains a rising instruction/falling instruction, or an instruction that requires multiple scans before the execution completion, is used in a sequence program to be executed multiple times in a single scan, the program may not operate normally.

| Item | Description |
|---|--|
| Program type to be executed multiple times in a single scan | <ul style="list-style-type: none"> • Periodic execution type program • Interrupt program • Subroutine program • FOR-NEXT instruction program |
| Unusable instructions for FBs which are used for above programs | Instructions which require multiple scans before the execution completion (JP.READ/JP.WRITE instruction, SORT instruction, SP.FREAD/SP.FWRITE instruction, etc.) |
| | Rising instruction (□P instruction (such as MOVP instruction), PLS, etc.) |
| | Falling instruction (PLF, LDF, ANDF, ORF, MEF, FCALLP, EFCALLP, etc.) |

Creating a function block from an existing ladder block

The following explains the method to create a function block by using a ladder block in a sequence program.

This method is supported only in a ladder program.

For the number of creatable function blocks, refer to the following:

☞ Page 131 Maximum number of units of data that can be created in one project (RCPU/LHCPU/FX5CPU)

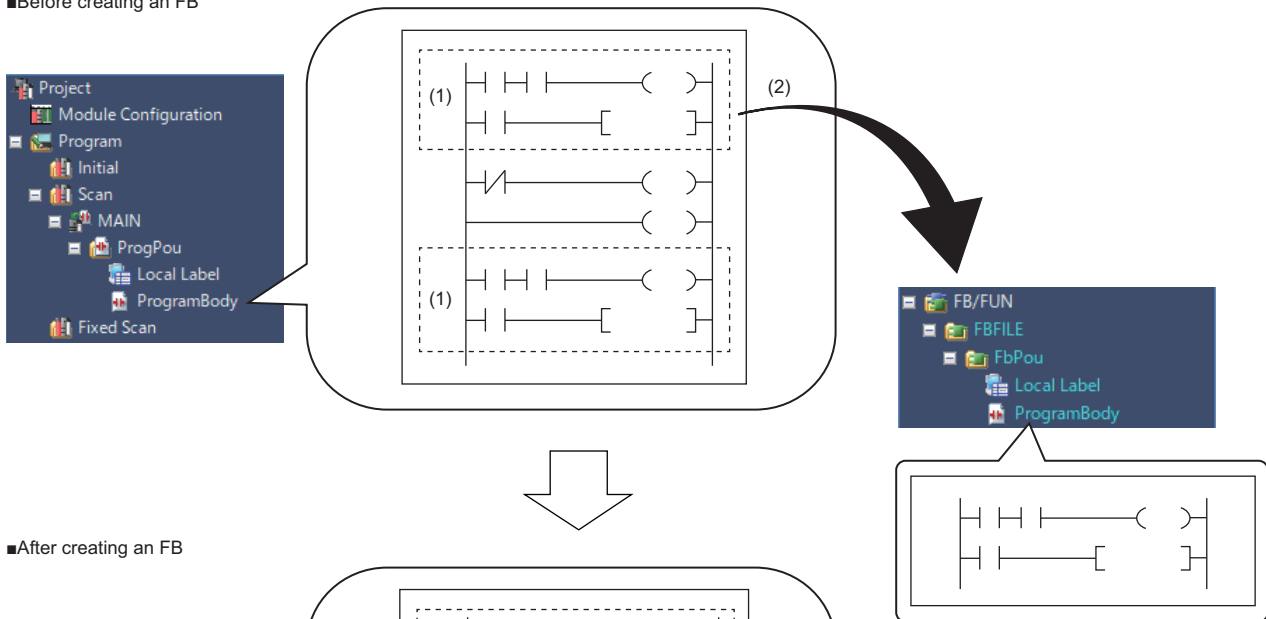
However, the maximum number of data that can be created may not be reached depending on the configuration of FB files and FUN files.

Usage example

■To segment a ladder block into an element

By segmenting an existing ladder block that is used repeatedly in a program into an element, it can be used in a program.

■Before creating an FB

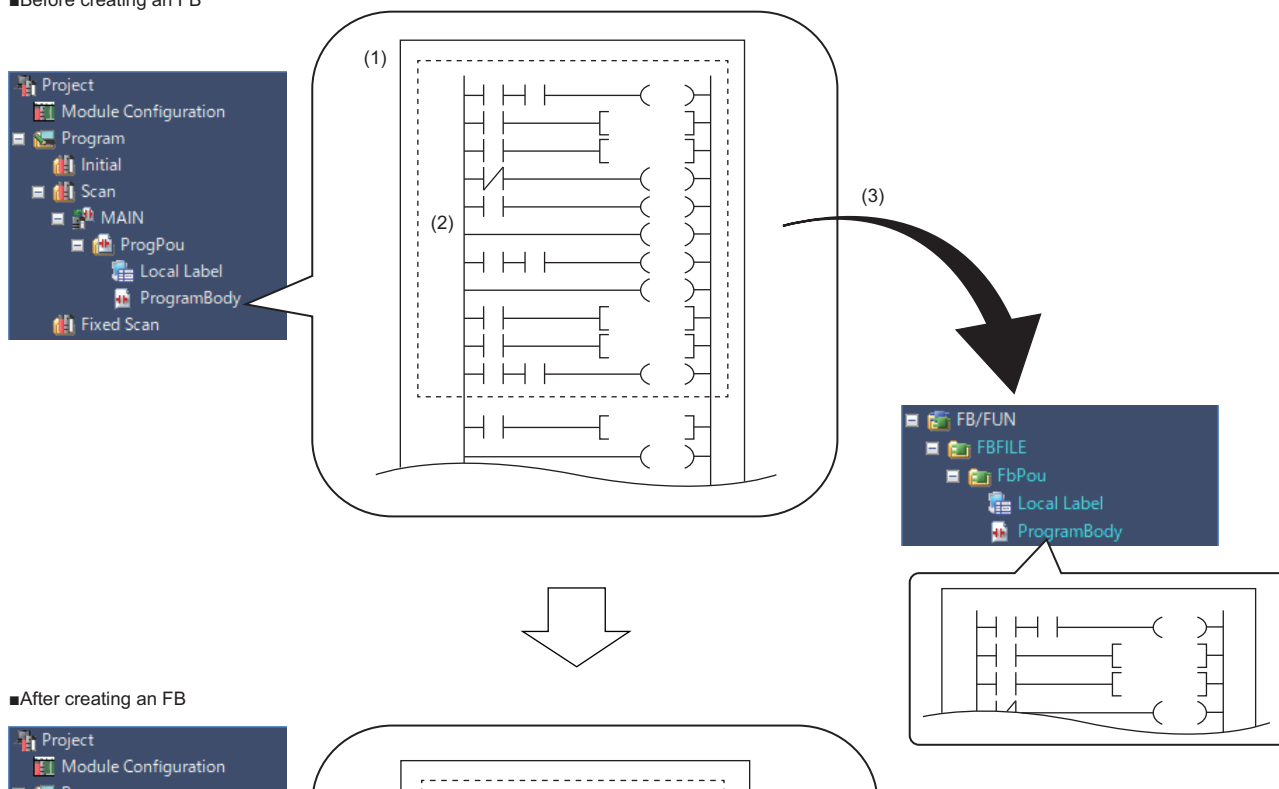


- (1) Ladder block used repeatedly in a program
- (2) Segment the ladder into an element (create a function block).
- (3) Utilize the created function block.

■To turn processing into a function

A program can be shortened by turning long processing in a ladder program into a function.

■Before creating an FB



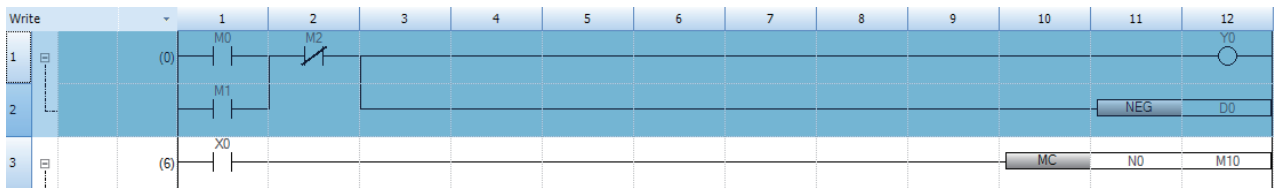
- (1) Long ladder program
- (2) Ladder block to be separated as one function
- (3) Turn the ladder block into a function (create a function block).
- (4) Utilize the created function block.

Creation method

The following shows the procedure for creating a function block from an existing ladder block.

Operating procedure

- 1. Select a ladder block to change it to a function block in a program editor.



- 2. Select [Edit] ⇒ [Create FB].
- 3. Set each item in "Basic Setting" and "Detail Setting" of the "Create FB" screen, and click the [OK] button.

For details on the setting items, refer to the following:

Page 506 Creating new data

The 'Create FB' dialog box has two tabs: 'Basic Setting' and 'Detail Setting'. The 'Basic Setting' tab is active and shows the following settings:

| Basic Setting | |
|---------------|----------------|
| Data Type | Function Block |
| (Data Name) | FbPou |

The 'Detail Setting' tab is also visible and shows the following settings:

| Detail Setting | |
|----------------------------|---------------------|
| Program Configuration | |
| Program Language | Ladder |
| Inherent Property | |
| Use MC/MCR to Control EN | No |
| Use EN/ENO | Yes |
| FB File | |
| FB File of Add Destination | <Same as data name> |
| FB Type | Subroutine Type |

Buttons: OK, Cancel

- 4. Set each item in "Set FB Instance" and "Local Label Definition Setting of FB," and click the [Execute] button.
- For details on "Local Label Definition Setting of FB," refer to the following:

Page 514 Local label definition setting for a function block

The 'Create FB' dialog box has a tab for 'Local Label Definition Setting of FB'. The settings are as follows:

Create a function block (FB) based on the selected program.
Created FB is inserted to the program position selected by the FB instance which is set by the setting shown below.

Set FB Instance

FB Instance Name: FbPou_1

Local Label Definition Setting of FB

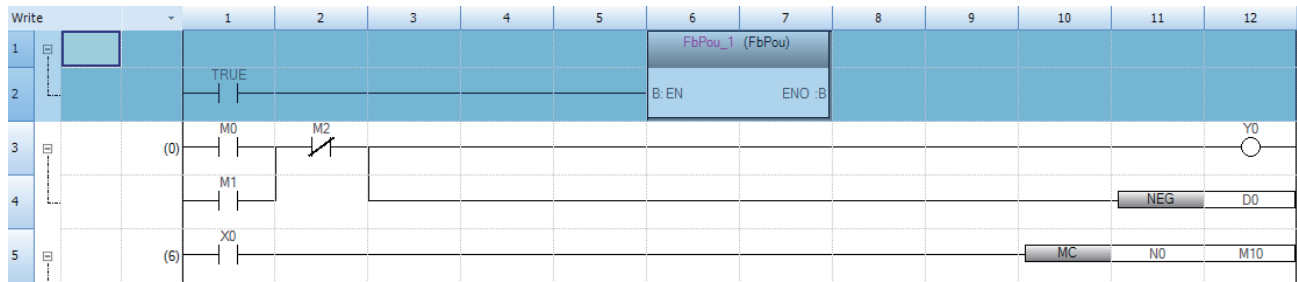
Define devices/labels extracted from a program to replace them as labels to use in a FB program.
* Information other than 'Data Type' of devices/labels is not inherited to labels of FB.
* If defining the extracted devices/labels as labels of FB is not required, please uncheck the checkbox for Device/Label Name.

☒ Define all devices/labels as labels of FB.

| Device/Label Name | Label Name | Data Type | Class |
|--|------------|---------------|-------|
| <input checked="" type="checkbox"/> M0 | >> v_bM0 | Bit | VAR |
| <input checked="" type="checkbox"/> M1 | >> v_bM1 | Bit | VAR |
| <input checked="" type="checkbox"/> M2 | >> v_bM2 | Bit | VAR |
| <input checked="" type="checkbox"/> Y0 | >> v_bY0 | Bit | VAR |
| <input checked="" type="checkbox"/> D0 | >> v_wD0 | Word [Signed] | VAR |

Buttons: Manual, Back to, Execute, Cancel

A function block is created and inserted above the ladder block selected in step 1.



5. Convert the program.

If a conversion error occurs, take corrective actions described in the following:

📖 Page 516 Troubleshooting

6. Delete the ladder block selected in step 1 from the program.

Point

When creating a function block from a ladder block for which a statement is set, operation will be as follows, regardless of whether the statement is selected:

- A created function block is inserted above the statement.
- The statement is added in the program of the created function block.

Label automatic naming rule

A label name is set according to the automatic naming rules.

For the automatic naming rules and prefixes to be added, refer to the following:

📖 Page 240 Automatic naming rule

If the class is set to "VAR" in "Local Label Definition Setting of FB" in the "Create FB" screen, 'v_' is added as a prefix.

In addition, symbols are converted into character strings.

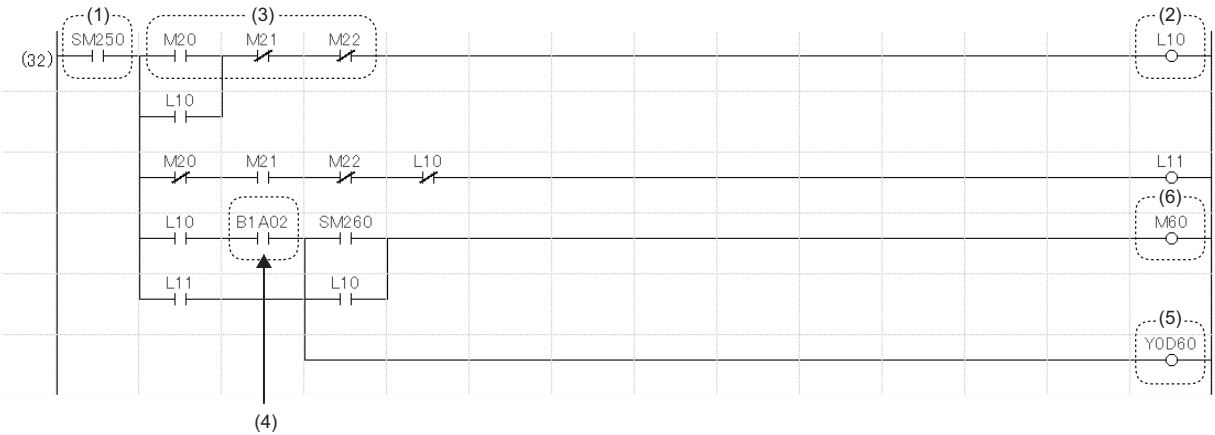
| Symbol | Character string |
|--------|---------------------|
| # | sh_ |
| @ | at_ |
| \ | - |
| [| - |
|] | "" (Null character) |
| , | - |
| . | - |

■Local label definition setting for a function block

The following shows a setting example of "Local Label Definition Setting of FB" in the "Create FB" screen.

Ex.


Segmenting a ladder block into an element



| No. | Description | Setting item | Setting content |
|-----|--|-------------------|---|
| (1) | Device that is always ON | Device/Label Name | Unselect the checkbox. (Use the device as is.) |
| (2) | Device that is used only in a selected ladder block | Class | VAR |
| (3) | Device that is used before and/or after a selected ladder block | | VAR_INPUT |
| (4) | Device that is used as a contact | | |
| (5) | Device that is used only as a coil | | VAR_OUTPUT |
| (6) | Device that is used as a coil and is also used before and/or after a selected ladder block | | VAR_IN_OUT |

Ex.

Turning processing into a function

Processing can be turned into a function as is by unselecting the checkbox of "Define all devices/labels as labels of FB." in "Local Label Definition Setting of FB" of the "Create FB" screen. ( Page 512 Creation method)

Considerations when creating a function block

■ Conversion state of a program

If a program is in the unconverted state, the "Create FB" screen cannot be opened.

■ Device settings

The following devices cannot be set as input, output, or input/output arguments.

- Timer
- Retentive timer
- Long timer
- Long retentive timer
- Counter
- Long counter

Change the corresponding device to a global label to which the device is assigned before creating a function block.

Alternatively, unselect the checkbox of the device in "Local Label Definition Setting of FB" in the "Create FB" screen.

Local Label Definition Setting of FB

Define devices/labels extracted from a program to replace them as labels to use in a FB program.
 *Information other than 'Data Type' of devices/labels is not inherited to labels of FB.
 *If defining the extracted devices/labels as labels of FB is not required, please uncheck the checkbox for Device/Label Name.

☐ Define all devices/labels as labels of FB.

| Device/Label Name | Label Name | Data Type | Class |
|---|------------|-----------|-------|
| <input type="checkbox"/> T10 | >> v_tdT10 | Timer | VAR |
| <input checked="" type="checkbox"/> M1 | >> v_bM1 | Bit | VAR |
| <input checked="" type="checkbox"/> M13 | >> v_bM13 | Bit | VAR |

Manual Back to Execute Cancel

Point

By unselecting the checkbox of a device in "Local Label Definition Setting of FB" in the "Create FB" screen, the device/label can be used as is in the program of a function block.

■ Use of module labels

A conversion error may occur if a module label is set as an argument of a subroutine type function block.

Use a macro type function block.

■ Instructions with a string type argument

When creating a function block, a device that is specified as an argument in an instruction using the string data type is defined as a string type label with the data length of "32."

To change the data length, follow the procedure below:

Operating procedure

1. Open a local label editor of a function block.
2. Change the data length in the "Data Type" column for an added label.

Troubleshooting

A conversion error may occur if a certain device, instruction, function block, or function is used in a selected ladder block. The following table explains corrective actions for an conversion error for each device, instruction, function block, and function.

Device/instruction/function block/function

Instruction that specifies the number of device/label points to access with its argument
(Example: BMOV)

Corrective action

Set the data type by an array.
The following figure shows a correction example.
(Example) BMOV

| | | | | |
|--|------|---------|---------|----|
| | BMOV | wLabel1 | wLabel2 | K3 |
|--|------|---------|---------|----|

- ❶ Open the local label editor for a function block.
- ❷ Click [...] in the "Data Type" column that is blanked out, and set "Data Type" and "Array Element."

| | Label Name | Data Type | |
|---|------------|-----------|-----|
| 1 | v_bM10 | Bit | ... |
| 2 | v_wLabel1 | | ... |
| 3 | v_wLabel2 | | ... |
| 4 | | | ... |

Target(L)
<ALL>

Type Category
☒ Simple Types
☐ Structured Data Type
☐ Function Block

Array Element
☒ ARRAY
Element (1 dimension) 3
Element (2 dimensions) 0
Element (3 dimensions) 0

Data Type
Bit
Word [Unsigned]/Bit String [16-bit]
Double Word [Unsigned]/Bit String [32-bit]
Word [Signed]
Double Word [Signed]
FLOAT [Single Precision]
FLOAT [Double Precision]
Time
String (32)
String [Unicode] (32)
Pointer
Timer
Counter
Long Counter
Retentive Timer

OK Cancel

Instruction with an argument for which only devices or array labels are available
(Example: D*)

Set the data type by an array.
The following figure shows a correction example.
(Example) D*

| | | | | |
|--|----|------------|------------|------------|
| | D* | wLabel2[0] | wLabel3[0] | dLabel4[0] |
|--|----|------------|------------|------------|

- ❶ Open the local label editor for a function block.
- ❷ Click [...] in the "Data Type" column for an array type label, and set "Array Element."

| | Label Name | Data Type | |
|---|-------------|----------------------|-----|
| 1 | v_bM10 | Bit | ... |
| 2 | v_wLabel2_0 | Word [Signed] | ... |
| 3 | v_wLabel3_0 | Word [Signed] | ... |
| 4 | v_dLabel4_0 | Double Word [Signed] | ... |
| 5 | | | ... |

Target(L)
<CALL>

Type Category
☒ Simple Types
☐ Structured Data Type
☐ Function Block

Array Element
☒ ARRAY
Element (1 dimension) 3
Element (2 dimensions) 0
Element (3 dimensions) 0

Data Type
Bit
Word [Unsigned]/Bit String [16-bit]
Double Word [Unsigned]/Bit String [32-bit]
Word [Signed]
Double Word [Signed]
FLOAT [Single Precision]
FLOAT [Double Precision]
Time
String (32)
String [Unicode] (32)
Pointer
Timer
Counter
Long Counter
Retentive Timer

OK Cancel

| Device/instruction/function block/function | Corrective action | | | | | | | | | | | | | | | | | | | | |
|--|---|--|------------|-----------|-------|------------------------------|------------|--|-----|--|------------|--|-----|---|-----------|--|-----|---|--|--|-----|
| Function block/function with an generic data type argument (Example: ADD) | <p>Set the correct data type.</p> <p>Open the local label editor for a function block, and correct the setting in the "Data Type" column.</p> <table><tr><th></th><th>Label Name</th><th>Data Type</th><th></th></tr><tr><td>1</td><td>v_wD0</td><td>Double Word [Unsigned]/Bit String [32-bit]</td><td>...</td></tr><tr><td>2</td><td>v_udLabel2</td><td>Double Word [Unsigned]/Bit String [32-bit]</td><td>...</td></tr><tr><td>3</td><td>v_wD2</td><td>Double Word [Unsigned]/Bit String [32-bit]</td><td>...</td></tr><tr><td>4</td><td></td><td></td><td>...</td></tr></table> | | Label Name | Data Type | | 1 | v_wD0 | Double Word [Unsigned]/Bit String [32-bit] | ... | 2 | v_udLabel2 | Double Word [Unsigned]/Bit String [32-bit] | ... | 3 | v_wD2 | Double Word [Unsigned]/Bit String [32-bit] | ... | 4 | | | ... |
| | Label Name | Data Type | | | | | | | | | | | | | | | | | | | |
| 1 | v_wD0 | Double Word [Unsigned]/Bit String [32-bit] | ... | | | | | | | | | | | | | | | | | | |
| 2 | v_udLabel2 | Double Word [Unsigned]/Bit String [32-bit] | ... | | | | | | | | | | | | | | | | | | |
| 3 | v_wD2 | Double Word [Unsigned]/Bit String [32-bit] | ... | | | | | | | | | | | | | | | | | | |
| 4 | | | ... | | | | | | | | | | | | | | | | | | |
| Instruction with an argument for which only devices are available (Example: EGP) | <p>Take either of the following corrective actions:</p> <ul style="list-style-type: none">Unselect the checkbox of the corresponding device in "Local Label Definition Setting of FB" in the "Create FB" screen when creating a function block. | | | | | | | | | | | | | | | | | | | | |
| Any of the following devices: <ul style="list-style-type: none">TimerRetentive timerLong timerLong retentive timerCounterLong counter | <div><div>Local Label Definition Setting of FB</div><div>Define devices/labels extracted from a program to replace them as labels to use in a FB program. * Information other than 'Data Type' of devices/labels is not inherited to labels of FB. * If defining the extracted devices/labels as labels of FB is not required, please uncheck the checkbox for Device/Label Name.</div><div><input type="checkbox"/> Define all devices/labels as labels of FB.</div><table><tr><th>Device/Label Name</th><th>Label Name</th><th>Data Type</th><th>Class</th></tr><tr><td><input type="checkbox"/> T10</td><td>>> v_tdT10</td><td>Timer</td><td>VAR</td></tr><tr><td><input checked="" type="checkbox"/> M1</td><td>>> v_bM1</td><td>Bit</td><td>VAR</td></tr><tr><td><input checked="" type="checkbox"/> M13</td><td>>> v_bM13</td><td>Bit</td><td>VAR</td></tr></table><div>ManualBack toExecuteCancel</div></div> <ul style="list-style-type: none">Change the corresponding device to a global label to which the device is assigned. | Device/Label Name | Label Name | Data Type | Class | <input type="checkbox"/> T10 | >> v_tdT10 | Timer | VAR | <input checked="" type="checkbox"/> M1 | >> v_bM1 | Bit | VAR | <input checked="" type="checkbox"/> M13 | >> v_bM13 | Bit | VAR | | | | |
| Device/Label Name | Label Name | Data Type | Class | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> T10 | >> v_tdT10 | Timer | VAR | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> M1 | >> v_bM1 | Bit | VAR | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> M13 | >> v_bM13 | Bit | VAR | | | | | | | | | | | | | | | | | | |

■Returning a program to the state before a function block was created

If an conversion error occurs, a program can be returned to the state before a function block was created by the following procedure.

Operating procedure

1. Delete a function block inserted in a program.
2. Delete the added labels of the function block in the local label editor of the program.
3. Select "FB/FUN" in the navigation window and delete the added FB file.








Creating a user-defined tag FB

The control processing of a manufacturer-defined tag FB can be customized by creating a user-defined tag FB.

In the FB program of a user-defined tag FB, the tag data can be referenced by using a tag access FB of a process control function block and a structure label for tag data reference.

A user-defined tag FB can be used only in an FBD/LD program for process control in projects for an RnPCPU (process mode/redundant mode) and an RnPSFCPU.

Procedure to use

1. Create new function block data. ( Page 518 Creating data)
2. Create a program body of a user-defined tag FB. ( Page 518 Creating a program)
3. Register a tag FB for which a user-defined tag FB has been specified on the tag FB setting editor.( Page 260 Registering Tag FBs)
4. Create an FBD/LD program for process control by using a tag FB instance of a registered user-defined tag FB.
5. Set the initial value of an FB property. ( Page 387 Display/setting an FB property)
6. Write the program to the programmable controller. ( Page 600 Writing data to a programmable controller)
7. Monitor and debug the program by displaying a faceplate.( Page 684 Checking Tag Data)
8. Apply the initial value of the FB property. ( Page 689 FB Property Management (Online) screen)

Precautions

If the definition of a user-defined tag FB is deleted in the navigation window, a project may become incorrect.

Before deleting a user-defined tag FB, search a project for the FB definition name by using the character string search function and check that it is not used.

Creating data

A function block data can be created in a project on the "New Data" screen.

| Item | | | Description |
|----------------|-----------------------|----------------------------|---|
| Detail Setting | Program Configuration | Program Language | Select a programming language to be used in a function block. When creating a user-defined tag FB, select "FBD/LD." |
| | | Use as Tag FB | Select whether to use a function block as a tag FB. When creating a user-defined tag FB, select "Yes." |
| | | Tag Type | Select a tag type. |
| | FB File | FB File of Add Destination | Select a storage destination file of a function block to be created. A new storage destination file can be created by entering a file name directly. |
| | | FB Type | When creating a user-defined tag FB, "Subroutine Type" is selected automatically. |

Creating a program

Create a program body of a user-defined tag FB by combining a function and a function block.

The method for entering programs is the same as that of an FBD/LD program.

Precautions

- Do not use the EI instruction in a user-defined tag FB or a function and function block which is called from a user-defined tag FB
- User-defined tag FBs cannot be copied to other project.

■Tag access FB

Tag access FBs can be used in a user-defined tag FB.

However, if a tag access FB to use does not support the tag type of a user-defined tag FB type, the tag access FB cannot be used.

For details on the tag types and their corresponding tag access FBs, refer to 'Correspondence table of tag types and tag access FBs' in the following manual:

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

■Structure label for tag data reference

When using a tag data value (such as the SV value, PV value, MV value) in a program of a user-defined tag FB, use a structure label for tag data reference.

Structure labels for tag data reference can only be used in the FB program of a user-defined tag FB.

For details on the structure labels for tag data reference that can be used in each tag type, refer to 'Tag type list' in the following manual:

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

Precautions

When the global label setting "M+PTAG" or tag data structure in a project is deleted, a structure label for tag data reference is also deleted. Add a structure label for tag data reference in the FB program of a user-defined tag FB.

- [Edit] ⇒ [Process Control Extension] ⇒ [Add Structured Data Type Label for Tag Data Reference]

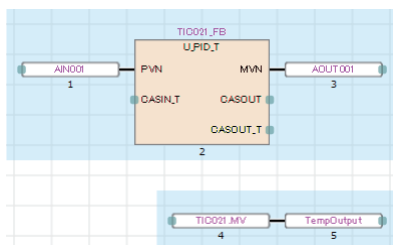
■Usage example of tag data

To use the member of tag data of a user-defined tag FB in an FBD/LD program for process control, create a variable element with a name '(label name of the tag data).(member name of the tag data).'

Ex.

When using the MV value of user-defined tag FB 'TIC021_FB,' create a variable element with the name 'TIC021.MV.'

- Label name of tag data: TIC021
- Member name of tag data: MV



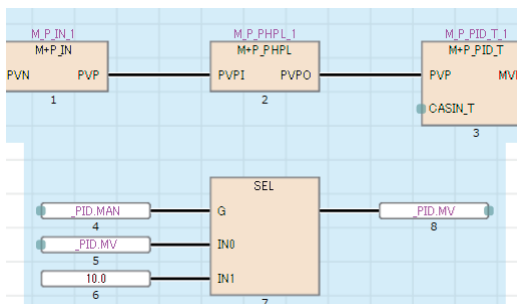
■Usage example of a structure label for tag data reference

To use the member of tag data of a user-defined tag FB in the FB program of a user-defined tag FB, create a variable element with a name '(name of a structure label for tag data reference. member name of the tag data).'

Ex.

When using the MV value of a user-defined tag FB (tag type: PID), create a variable element with the name '_PID.MV.'

- Structure label for tag data reference: _PID (tag type: PID)
- Member name of tag data: MV



Method for having an operation constant to a user-defined tag FB

The following shows the procedure for directly setting an initial value such as that of an operation constant of a tag access FB used in an user-defined tag FB from the user-defined tag FB in a program.

For details on operation constants, refer to the following:

MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

Operating procedure

1. Register a label of 'VAR_PUBLIC' class or 'VAR_PUBLIC_RETAIN' class to a local label of a user-defined tag FB.
2. Substitute the registered label (step 1) for an operation constant.

To substitute a label for an operation constant of a tag access FB, use a variable element.

Example)

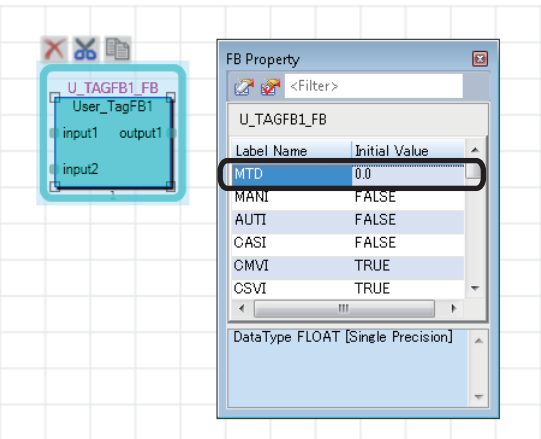
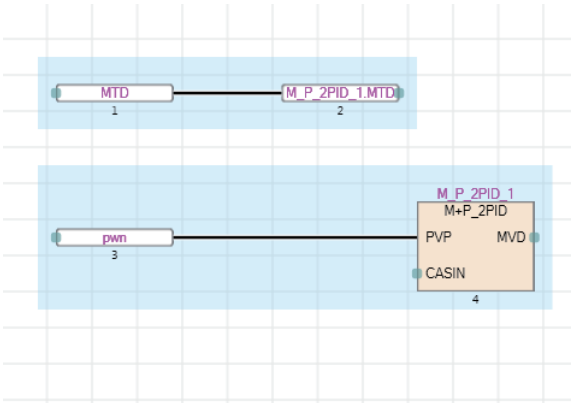
When substituting a label for the operation constant 'MTD' with the tag access FB (label name: M_P_2PID_1), define a variable element with the label name 'M_P_2PID_1.MTD.' Connect the label registered in step 1 and the variable label with the name "M_P_2PID_1.MTD."

3. Register a user-defined tag FB on the tag FB setting editor.
4. Place the user-defined tag FB (step 3) on an FBD/LD program.
5. Select the placed user-defined tag FB.

The registered label (in step 1) is displayed in the "FB Property" window.

For details on the "FB Property" window, refer to the following:

Page 387 Display/setting an FB property



Using a module FB

In GX Works3, 'Module FB,' which is composed of the segmented processing for each module (function block), is provided. By using the module FBs, the operation settings can easily be performed without programming the processing of each module.

Note that the module FBs cannot be used in safety programs.

Importing module FBs in a project

Module FBs are displayed in the [Module] tab in the element selection window when one of the following operations is performed.

- Place a module on the module configuration diagram and fix parameters.
- Add a new module in the navigation window.



The manual of module FBs can be opened from the element selection window. Select and right-click a module FB, then select [Help] from the shortcut menu.

Using a module FB in a program

Operating procedure

1. Drag a module FB in the [Module] tab in the element selection window and drop it onto a program.
2. Select the local label or global label from the pull-down list in the "FB Instance Name" screen, and enter an FB instance name.

The FB instance is inserted into the program.

In addition, the definition of the module FB is added to "M_FBLIB" in the navigation window.

Precautions

- When using a module FB, registering a module label in advance (at creation of new project) is recommended. Otherwise, it may take time when using the module FB.
- Do not assign the instance of a module FB to an alias. (📖 Page 238 Alias)

- An error occurs when converting a program, such as (1) in the following figure, which is created by using a transfer instruction or assignment statement in order to pass the value of a module label to the member of an FB instance of a module FB. Modify the program so that the module label is connected to the input variable of the FB instance of the module FB such as (2).

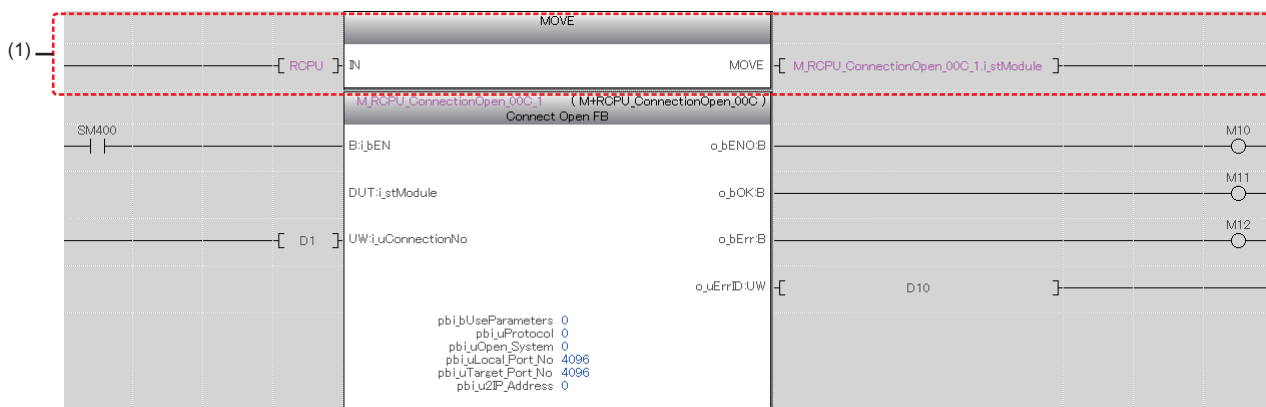
Ex.

The following shows a program example. The elements used in the program are as follows:

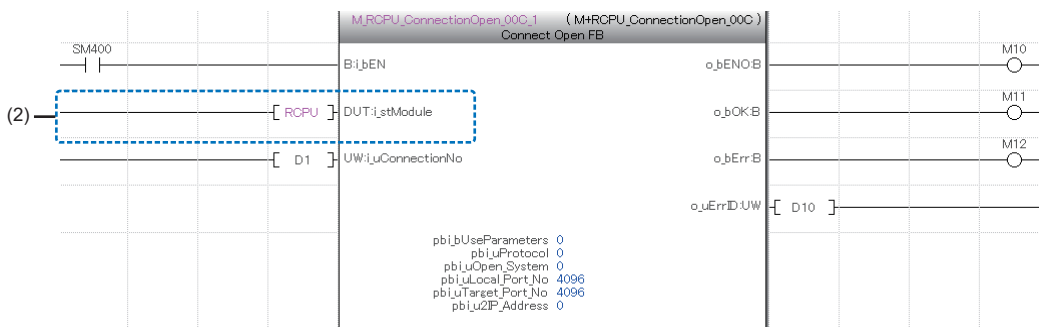
- Module label: RCPU
- Module FB: M_RCPU_ConnectionOpen_00C_1
- FB instance: M_RCPU_ConnectionOpen_00C_1
- Member (input variable): i_stModule

Ladder program

Program in which a conversion error occurs



Modification example



ST program

Program in which a conversion error occurs

(1)

```

M_RCPU_ConnectionOpen_00C_1.i_stModule := RCPU;

M_RCPU_ConnectionOpen_00C_1(
  i_bEN:= SM400 ,

  i_uConnectionNo:= D1 ,
  o_bENO=> M10 ,
  o_bOK=> M11 ,
  o_bErr=> M12 ,
  o_uErrID=> D10 );

```

Modification example

(2)

```

M_RCPU_ConnectionOpen_00C_1(
  i_bEN:= SM400 ,
  i_stModule:= RCPU ,
  i_uConnectionNo:= D1 ,
  o_bENO=> M10 ,
  o_bOK=> M11 ,
  o_bErr=> M12 ,
  o_uErrID=> D10 );



```


■Using a library associated with a module

Depending on a module (simple motion module), a library that is associated with a module can be used.

The following shows the procedure to use the library.

Operating procedure

1. In the [Module] tab in the element selection window, double-click "(module name)" under the tree of "Module FB."
2. Read the message, and click the [Yes] button.*¹
A message with "Environment Setup Procedure" described in is displayed.
3. Obtain a library by following the message.
4. Register the library to the library list. ( Page 532 Registering user libraries in the library list)
A shortcut to the library is added as a child item of "(module name)" in the tree expanded (double-clicked) in step 1.
5. Double-click the shortcut to the library.
6. Utilize an element from the library to a project. ( Page 533 Utilizing an element)

*¹ The message may not appear depending on the module.

Precautions

■When a library has already been registered

When a library associated with a module has already been registered in the library list, step 3 and 4 in the procedure above are not required.

According to the operations after step 1, data to be displayed as a child item of "(module name)" is determined.

The following shows each operation and data to be displayed.

| Operation | Data to be displayed |
|--|---|
| Check the displayed message, and click the [Yes] button. | A shortcut to the library only |
| Check the displayed message, and click the [No] button. | A shortcut to the library and a module FB |
| No operation (No message is displayed.) | A module FB only |

■Redisplay of a shortcut to a library

A shortcut to the library disappears once the project is closed.


When opening the project next time, select a module in which a library associated with the module is used.

By clicking the [Yes] button after reading the message*¹, a shortcut to the library is displayed again.

*¹ The message may not appear depending on the module.

■Redisplay of a module FB

To redisplay module FBs that are not displayed in the tree, perform any one of the following operations.

| No. | Operation |
|-----|--|
| 1 | Delete the library that is associated with a module from the library list. ( Page 532 Deleting libraries/updating display information) |
| 2 | <ol style="list-style-type: none"> ① Open the project again. ② In the [Module] tab of the element selection window, double-click "(module name)" under "Module FB" in the tree. ③ Click the [No] button in the confirmation message appeared. |

Setting the operation parameters for a module FB

Operating procedure

1. Open the label editor where the FB instance of a module FB is registered (local label or global label in a program where the module FB is used).

2. Select the FB instance and enter the initial value of a label within the extension display area.

However, the initial value of a label whose operation parameter is array cannot be set in a label editor. Set an initial value in a program.

When the operation parameter of a module FB which is set using the initial label value is changed in a program, the module FB operates with the changed value. Before changing the label values of a module FB, check the affect of the change using the cross reference function.

Editing a module FB

A local label and a program body of a module FB cannot be edited.

However, a module FB can be copied in the navigation window and the copied one can be edited.

'+' of the copied module FB names will be replaced with ' _ '.

Adding the definition of a module FB

The definition of a module FB can be added to the navigation window by dragging and dropping the module FB from the [Module] tab in the element selection window onto "FB/FUN" in the navigation window.

10.2 Creating a Function

This section explains the method to create a sequence program using functions.

Functions

For details of the functions, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Procedure to use

1. Create new function data. (📖 Page 525 Creating data)
2. Register a local label to be used in a FUN program. Maximum 5120 local labels can be registered in a function.
(📖 Page 525 Setting labels)
3. Create a FUN program using labels. (📖 Page 526 Creating a program)
4. Paste the function into a sequence program.
(Ladder program: 📖 Page 290 Inserting a function, ST program: Page 325 Inserting a function)

Creating a function

The following explains the method to create a function.

For the number of creatable functions, refer to the following:

📖 Page 131 Maximum number of units of data that can be created in one project (RCPU/LHCPU/FX5CPU)

However, the maximum number of data that can be created may not be reached depending on the configuration of FB files and FUN files.

Creating data

A function block data can be created in a project on the "New Data" screen.

| Item | | | Description |
|----------------|-----------------------------|-----|---|
| Detail Setting | Use EN/ENO | Yes | Become a function with EN/ENO. EN/ENO labels can be used in a program without registering as local labels. For details on EN/ENO, refer to the following: 📖 MELSEC iQ-R Programming Manual (Program Design) 📖 MELSEC iQ-F FX5 Programming Manual (Program Design) |
| | | No | Become a function without EN/ENO. |
| | FUN File of Add Destination | | Select the storage destination file of a function to be created. A new storage destination file can be created by entering a file name directly. |

Setting labels

Set a label to use in a program body on a label editor.

The operations in the editor are the same as that in other label editors. For details, refer to the following:

📖 Page 235 Registering Labels

Operating procedure

Select "FB/FUN" ⇒ "(file name)" ⇒ "(Function)" ⇒ "Local Label" in the navigation window.

Creating a program

Create a program body of a function by using a label.

The labels set to the local label of the function can be used.

The method for entering programs is the same as that of each program.

Operating procedure

1. Select "FB/FUN" ⇒ "(file name)" ⇒ "(function)" ⇒ "ProgramBody" in the navigation window.
2. Configure the programs.

Converting functions

- Functions (POUs) will not be in the converted state even if the conversion was attempted as long as functions are not used in the program, or functions are used only in unregistered programs.
- When a function is edited, all the programs in which the FUN file and the function are used will be in unconverted state.

■When editing only the program body of a function

By setting the following option, only an edited FUN program or FUN file will be in unconverted state.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Convert, Online Program Change Target Setting"

When an unconverted function is converted after changing the option from "High-speed" to "Low-speed," a POU including the function is also converted.

10.3 Enhancing Use of User Library

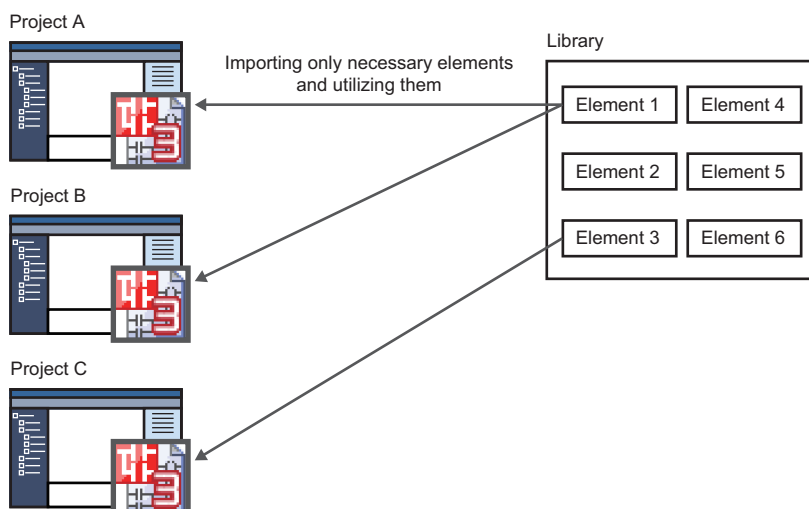
This section explains the method to store a created element in a library file and utilize it to a sequence program. In this section, the user library is explained as a library.

User libraries

The user library collects the elements which are used generally in multiple projects to make them easy to utilize. It can be used by importing elements of a library into each project.

The following data can be registered in the user library.

- POU's (program block, function block, function)
- Global labels, structures
- Module labels, module FBs
- Each program device comments, common device comments



Procedure to use

1. Create a library file. (📖 Page 528 Creating a library)
2. Register a library in GX Works3. (📖 Page 532 Registering user libraries in the library list)
3. Utilize elements from a library to projects. (📖 Page 533 Utilizing an element)

Precautions

When using the library file which is on a network drive or a removable media, save the file in the hard disk of a personal computer before using.

Creating a library

The following explains the operations such as the creation and editing methods of a library.

Preparing a source project for library

To create a library, a source project is required.
Prepare an existing project or a project that collects the elements to be registered in a library.

Precautions

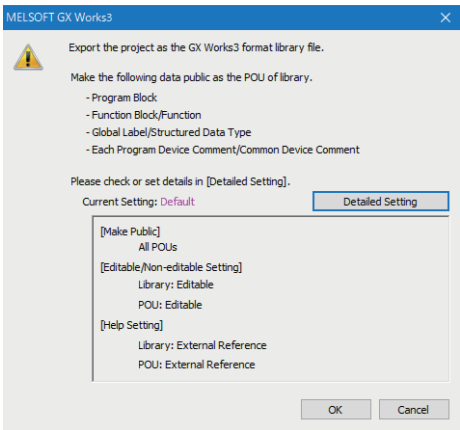
After registering a library, the registered elements are displayed in the [Library] tab in the element selection window. However, the information of global labels (such as label name, and data type) is not displayed.
When creating a library that includes multiple global labels, set comments to distinguish them on the "Properties" screen of global labels.

Creating a library file

A library file can be created by exporting a project as a library file (*.usl).
The library file is a file that stores the data related with elements in a project.
To prevent libraries and elements from falsification, set a password when exporting them.

Operating procedure



1. After creating elements in a project, select [Project] ⇒ [Library Operation] ⇒ [Export Library].
2. Click the [OK] button in the confirmation screen appeared.



By clicking the [Detailed Setting] button on the screen above, the following can be set on the "Library Export Detailed Settings" screen.

| Item | Description |
|-------------------------------|---|
| Make Public | Set whether to release or close the data to users who use the library. |
| Editable/Non-editable Setting | Set whether to set a password to edit to the exported library. When setting a password, the applicability of editing (editable/read-only/read-protected) can be set for each element. Additionally, an individual password can be set to a read-protected POU. By selecting the checkbox of "Disable Password Authentication," editing of a read-protected POU can be disabled. (☞ Page 529 POU's whose password authentication is disabled) |
| Help Setting | Set whether to import the help file to the library or refer it externally. |

Precautions

- When "Security Version" is set to "1" and "File Size" is set to "Compression" in the "Properties" screen, the project cannot be exported as a library file. Select "Standard" for the setting in advance.
( Page 145 Compressing a project file)
- For read-only or read-protected elements utilized from other libraries, the reading applicability of the elements cannot be changed when exporting them.
- For the characters that cannot be used for a library name, refer to the following:
( Page 925 Unusable character strings for a name of a project/work space/library)


■POUs whose password authentication is disabled

When disabling password authentication for a read-protected POU, note the following on a library file in which a read-protected POU has been registered, and on a project in which the library file was created.

- Do not delete them; otherwise, the POU cannot be opened.
- It may not be determined if they are the latest ones.

To prevent this, before creating a library file, setting version information to the library file or a project in which the library file is to be created is recommended.

The operating procedure for setting version information is shown below.



| Item | Operating procedure |
|--------------|--|
| Project | <ol style="list-style-type: none"> 1. Select "Project" in the navigation window. 2. Right-click it and select [Properties] from the shortcut menu. 3. Enter a text for "Version" in the "Properties" screen. 4. Click the [OK] button. 5. Save the project. |
| Library file | <ol style="list-style-type: none"> 1. Enter a text for "Version" in the "Export Library" screen which appears when creating a library file. ( Page 528 Creating a library file) 2. Click the [Save] button. |

■Security version of a project

When creating a library file in a project whose security version is '2,' note the following:

- When registering a library file to a library list, then opening the library and changing the security version from '2' to '1,' the settings at the export are initialized. Reconfigure the settings to export the library again.
- A project password for a library needs to be set at export. The purpose is different between a project password for a library and that for a project.

The following table shows the passwords to be used.

| Password type | Setting target | Purpose |
|--------------------------------|----------------|---|
| Project password for a library | Library | To register, edit, or refer to a library. For details, refer to the following:  Page 722 Library operation |
| Project password for a project | Project | To perform an operation or function which requires the project authentication. For details, refer to the following:  Page 722 Project authentication |
| Register password | | To perform the following operations: <ul style="list-style-type: none"> • Changing the security version of a project from '2' to '1' • Changing the project password |

Creating a GX Works3 format library from a GX Works2 format library

Remote head modules do not support this function.

Operating procedure

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX Works2 Format] ⇒ [Open User Library], and specify the library to be converted into a GX Works3 project.
2. Select the series in the confirmation screen displayed, then click the [OK] button.
3. Check the contents of the project after changing the module type, and edit the project as necessary.
4. Export the project as a library file.

Creating a GX Works3 format library from a GX IEC Developer format library

This function is supported for the SUL format files which are created with GX IEC Developer version 7.04.

Operating procedure

■A GX Works3 project is open

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX IEC Developer Format] ⇒ [Open SUL Format User Library], and specify a library to convert to GX Works3 project.
2. Read the displayed message, and click the [OK] button.
3. Check the contents of the project after changing the module type, and edit the project as necessary.
4. Export the project as a library file.

■A GX Works3 project is not open

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX IEC Developer Format] ⇒ [Open SUL Format User Library], and specify a library to convert to GX Works3 project.
2. Read the displayed message, and click the [OK] button.

The "New" screen appears.

3. Set each items in the "New" screen, and click the [OK] button.
4. Check the contents of the project after changing the module type, and edit the project as necessary.
5. Export the project as a library file.

■Import of some library POU's

1. Create a GX Works3 format library from a GX IEC Developer format library. (☞ Page 530 Creating a GX Works3 format library from a GX IEC Developer format library)
2. Open a GX IEC Developer format project in a GX Works3 project by changing the module type. (☞ Page 118 Opening a GX IEC Developer format project)
3. Register the user library exported in step 1 in the library list. (☞ Page 532 Registering user libraries in the library list)
4. Copy the library POU's to the GX Works3 project.
5. Repeat step 1 to step 4 for each GX IEC Developer format library.

Precautions


When a password is set for the user library, entering password is required when importing library elements.

However, when the following option is set in GX IEC Developer, entering a password is not necessary.

- [Edit] ⇒ [User Library] ⇒ [Change Password] ⇒ "Change Password (user library name)" ⇒ "Allow read access for closed library"


Editing libraries

Elements in a library file can be edited, added and deleted same as projects.

The password authentication is required to edit a library protected by password. ( Page 722 Library operation)

Besides, the user registration is required for the library file exported from a safety project. ( Page 709 User management)

For details on the number of creatable pieces of data, refer to the following:

 Page 131 Maximum number of units of data that can be created in one project (RCPU/LHCPU/FX5CPU)

Operating procedure

1. Select [Project] ⇒ [Open Other Format File] ⇒ [GX Works3 Format] ⇒ [Open User Library].

2. Edit POU's.

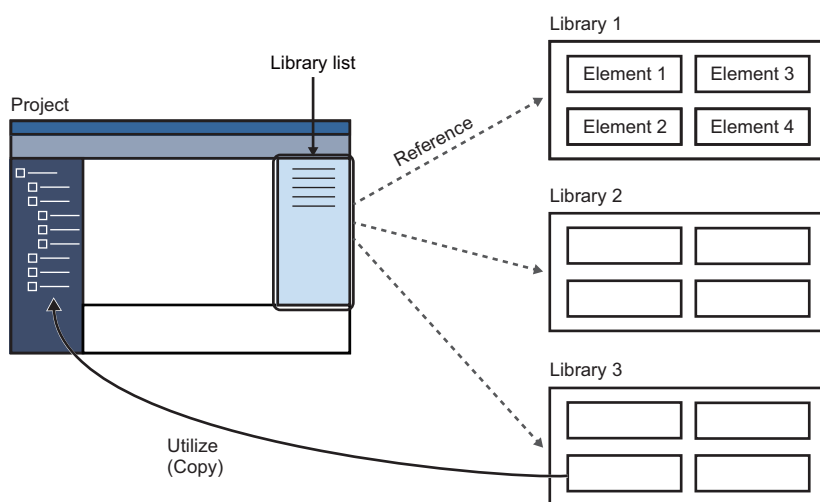
The editing method is the same manner as elements of the project.

Enhanced use of libraries

An element in a library can be utilized by registering the library in the library list.

The reference to the library file is registered in the library list.

The information of library file is saved not in a project unit but in a logon user unit on personal computer.



For the considerations for utilizing the library file created in the different version of GX Works3, refer to the following:

 Page 908 Using a Project in a Different Version

The project password authentication is required to utilize a library file created in a project whose security version is '2.' For details, refer to the following:

 Page 722 Library operation

Registering user libraries in the library list

Register a library containing elements to be utilized in the list.

Up to 64 libraries can be registered.

When the registered library file was edited while GX Works3 is running, updating the display information of library is necessary.

Operating procedure

■Registering libraries to be referenced

1. Select [Project] ⇒ [Library Operation] ⇒ [Register to Library List] ⇒ [User Library].
 2. Select a file in the "Register Library to Library List" screen, then click the [Open] button.
- For the library/element which is protected by password, the icon will be displayed in a pale color on the [Library] tab.

■Deleting libraries/updating display information

1. Select the [Library] tab in the element selection window.
2. Select the library to be deleted/updated, then select [Project] ⇒ [Library Operation] ⇒ [Delete from Library List] (🗑️)/[Update the Display Information of Library].

■Displaying Help

1. Select the [Library] tab in the element selection window.
2. Select a library or element, and select [Project] ⇒ [Library Operation] ⇒ [Help] or right-click [Help] from the shortcut menu.

■Displaying program files/FB files/FUN files

1. Select the [Library] tab in the element selection window.
2. Select [Project] ⇒ [Library Operation] ⇒ [Show Program/FB/FUN File].

Utilizing an element

A library POU registered in the element selection window can be utilized in other projects.

To utilize POUs which were set the read-protection when exporting the library, the password is required before editing.

Operating procedure

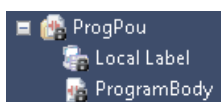
■Pasting elements onto the navigation window

1. Select an element in the [Library] tab in the element selection window. (Multiple selections allowed.)
2. Drag and drop the element onto the navigation window.

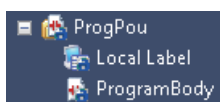
Elements can be dropped onto the place which is able to create the same kind of data only.

Read-protected POUs are displayed in the navigation window as follow.

Read-protected



Authenticated



■Pasting elements into a program editor (function block/function only)

1. Drag an element from the [Library] tab in the element selection window and drop it onto a sequence program.
2. For a function block, select the local label or global label from the pull-down list in the "FB Instance Name" screen, and enter an FB instance name.

■Making the read-protected POUs editable

1. Select and right-click a POU which was utilized and read-protected, and select [Enter the Password to Edit] from the shortcut menu.
2. Enter the password in the "Password Authentication" screen, and click the [OK] button.

The element will be editable until the project is closed.

■Copy of utilized elements

- When the data name of a utilized element has "+," it will be replaced with "_" after a copy. When data names are duplicated, '_n' is added to the names. ('n' is a sequential number starting from 1.)
- A read-protected element cannot be copied. However, it can be copied by entering password to edit.
- For an edit-protected element, the copy of the element can only be editable.

Precautions


■Utilizing multiple elements

If there is any of the following combinations in the selected elements, none of the selected elements can be utilized to a project; utilize the following elements individually.

- Different kinds of elements (Example: POU and global label)
- Elements from different libraries
- An SFC program and a program created in a programming language other than Sequential Function Chart language
- A standard program and a safety program
- A standard FB/FUN and a safety FB/FUN
- Global labels in different categories (standard, safety, or standard/safety shared)

■Module label, structure, and module FB

A module label, structure, and module FB cannot be utilized. Therefore, if utilizing an element in which any of the data is used, the module label and structure will be an undefined label, and the module FB will be changed to an undefined function block. To use these undefined data in the utilization destination program as a module label, structure, and/or module FB, add the module label, structure, and/or module FB to the utilization destination program.

In the following cases, set an alias in the project of utilization destination and set the label name same as the one of the utilized element. ( Page 238 Alias)

- An alias is used in a module label and/or structure of an utilized element
- An instance name differ between a module label and/or structure in a utilized element and an added module label and/or structure in a utilization destination

■POUs whose password authentication is disabled




A read protected POU whose password authentication is disabled cannot be edited in the utilization destination project.

When editing the POU, edit a library file in which this POU is included or data in a project in which the library file was created.

( Page 531 Editing libraries)

Additionally, the edited POU can be utilized to a project again by the following procedure.

Operating procedure

1. Export a library or project in which a POU is edited as a library file. ( Page 528 Creating a library file)
2. Register the library file created in step 1 to the library list of the project to be utilized. ( Page 532 Registering user libraries in the library list)
3. Utilize the POU to a project from the registered library. ( Page 533 Utilizing an element)

Updating library POU

Update the elements of a library imported to a project.

Multiple libraries and elements can be updated at once.

In addition, an element (call destination element) that is called from a selected element will also be updated at the same time.

When updating them, if an element with the same name does not exist in the project, the elements of the call destination will be added.

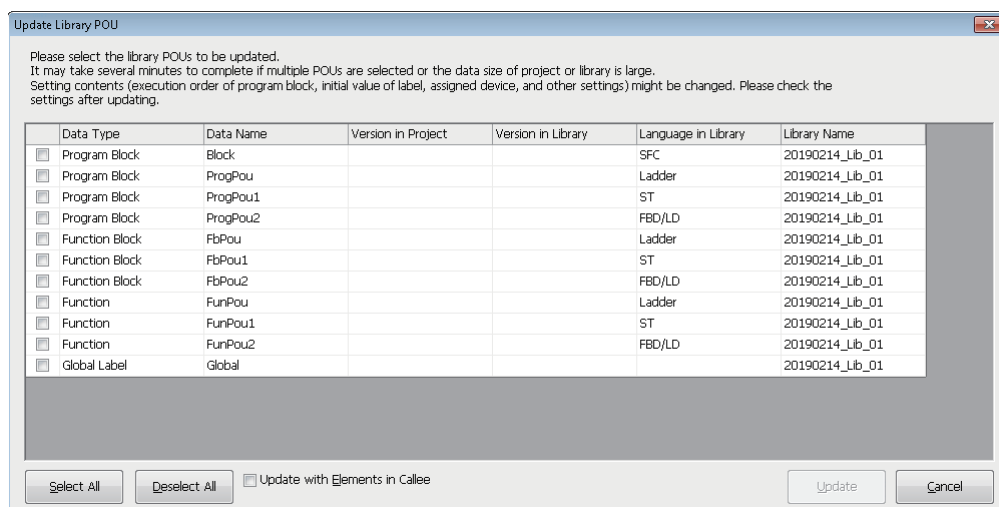
Window

1. Select a library or library POU to update in the [Library] tab in the element selection window.

2. Select [Project] ⇒ [Library Operation] ⇒ [Update Library POU].

Alternatively, right-click a library element, and select [Update Library POU] from the shortcut menu.

By updating library POU, set contents such as the execution order of program blocks, initial label values, or assigned devices may be changed; check these setting contents after the update.



Operating procedure

Set each item and click the [Update] button.

■ Call destination element

'Call destination element' refers to as an element used in a POU. (Example: A function block used in a program block)

The data types of call destination elements are as follows:

- Function block (Standard and safety)
- Function (Standard and safety)
- Structure
- Global label (standard, safety, and standard/safety shared)

Checking for library updates automatically

By selecting "Yes" in the following option, whether or not user libraries are updated is automatically checked.

- [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Element Selection" ⇒ "Update Check" ⇒ "Check User Library Date"

10.4 Enhanced Use of Application Library/MELSOFT Library

The application library/MELSOFT Library (sample library) are the element collection of program/function block/function/structure that composed of specific processing.

In this section, the application library/MELSOFT Library (sample library) are explained as a library.

An element in a library can be utilized by registering the library in the library list.

The elements are imported into a project with by registering a library.

The registration method of a library differs depending on the file extension (*.gx3s, *.mslm).

To obtain the library, please contact your local Mitsubishi Electric sales office or representative.

Remote head modules do not support these libraries.

Precautions

Before registering a library, confirm that the module type of the current project (CPU module) supports the library.

Registering libraries of which file extensions are 'gx3s'

Operating procedure

1. Select [Tool] ⇒ [Register Sample Library].
2. Select a file in the "Open Sample Library" screen, and click the [Open] button.

The function block of the library is added in the following FB files displayed in the navigation window.

- M_FBLIB: Mitsubishi Electric FA products
- P_FBLIB: partner's products

Registering libraries of which file extensions are 'mslm'


Operating procedure

■Registering libraries to be referenced

1. Select [Project] ⇒ [Library Operation] ⇒ [Register to Library List] ⇒ [Library].
2. Select a file in the "Register Library to Library List" screen, then click the [Open] button.

The registered library is displayed on the library list.

■Deleting libraries

1. Select the [Library] tab in the element selection window.
2. Select the library to be deleted, then select [Project] ⇒ [Library Operation] ⇒ [Delete from Library List] ()

■Updating libraries

To update a library, refer to the following:

 Page 535 Updating library POU's

Precautions

A safety FB library is automatically registered when installing GX Works3 for the first time.

However, once the safety FB library is deleted on the [Library] tab in the element selection window, the library needs to be registered manually.

To obtain the safety FB library, please contact your local Mitsubishi Electric sales office or representative.

PART 4

DEBUGGING AND OPERATION

This part explains the communication route setting to access a CPU module, reading/writing data, and monitoring the execution status.

11 PROGRAM SIMULATION

12 SETTING ROUTE TO CPU MODULE

13 WRITING/READING DATA TO CPU MODULE

14 CHECKING OPERATION OF PROGRAMS

11 PROGRAM SIMULATION

This chapter explains the method for debugging a program offline by using the simulation function.
For modules supporting the simulation function, refer to the following:

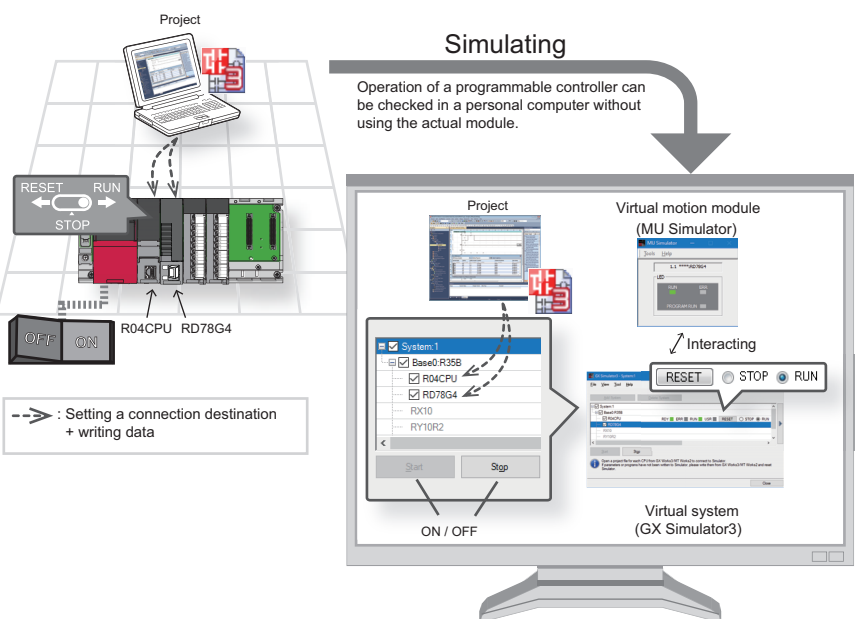
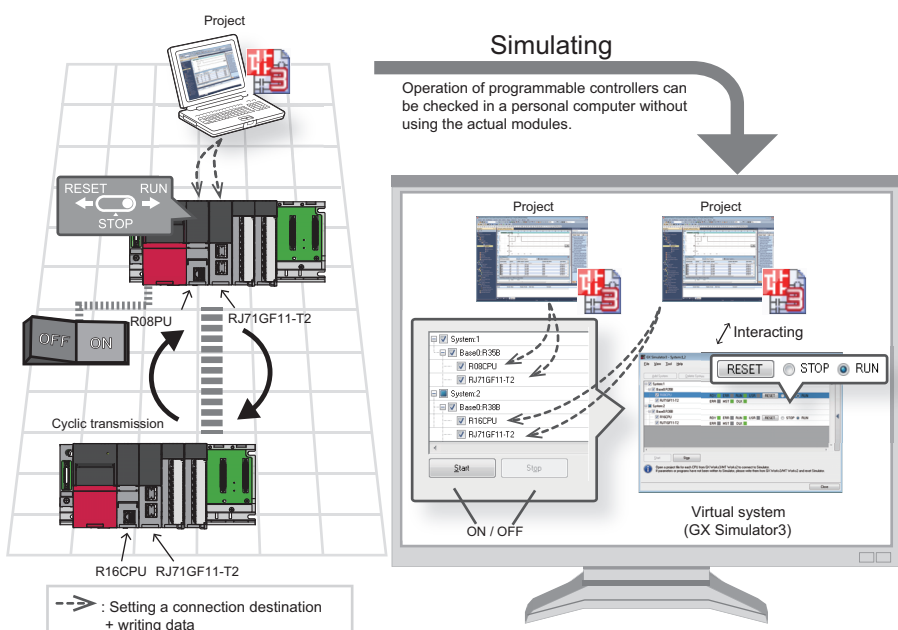
☞ Page 994 Using the Simulation Function

11.1 Simulation Functions

The Simulation function debugs programs using a virtual programmable controller on a personal computer.
GX Simulator3 is used for the Simulation function.
This function is useful to check programs before operating them actually since it enables debugging without the connection with CPU module.
The following five simulations can be performed in GX Simulator3.

| Purpose | Reference |
|--|-------------------------------------|
| <p>Simulation of a CPU module (host CPU)</p> | Page 542 Simulation of a CPU module |
| <p>Simulation of a multiple CPU system</p> | Page 549 Multiple CPU system |

FX5CPUs do not support it.

| Purpose | Reference |
|---|---|
| <p>Simulation of a system including a CC-Link IE TSN compatible motion module</p>  <p>FX5CPUs do not support it.</p> | <p>Page 556 Simple motion module/ motion module</p> |
| <p>Simulation of multiple systems including network modules that perform cyclic transmission or transient transmission (Example) Simulation of multiple systems performing cyclic transmission</p>  | <p>Page 558 Network modules</p> |

For the considerations for using the simulation function, refer to the following:

📖 Page 1038 Considerations

Safety and handling consideration

CAUTION

- The Simulation function simulates the actual module to debug a created sequence program. However, this function does not guarantee the operation of the debugged program.
- The Simulation function uses the memory for simulation to input and output data to/from an I/O module and intelligent function module. Some instructions/functions and device memory are not supported. Therefore, the operation results obtained with the virtual programmable controller may differ from those obtained using the actual module.

After debugging programs using the Simulation function, the normal program debugging, which is performed with the module connected before the actual operation, is required.

11.2 Simulation

This section explains the simulation methods.


During the simulation, GX Simulator3 is set as a connection destination and "Simulation ((system number).(CPU number))" is displayed in the status bar.

Simulation of a CPU module

This can be used when performing the simulation to a CPU module.

Starting a simulation

Window

Select [Debug] ⇒ [Simulation] ⇒ [Start Simulation] ().



Operating procedure

Select the checkbox of the data to be written on the "Online Data Operation" screen, and click the [Execute] button.

■Simulation of an RnPCPU (redundant mode)

A simulation runs with the following conditions:

- Operation mode: Separate mode
- Control system/standby system: Control system
- System A/B setting: System A
- Tracking transfer: No execution
- Extension cables of a redundant extension base unit: Single configuration

In addition, the following message appears when starting the simulation:

- Message: Connected PLC is running in Process Mode. The operation mode is different from the one for the project. Reset PLC to change the mode to Redundant Mode after completing writing. Are you sure you want to continue?

■Simulation of an RnPSFCPU

A simulation runs with the following conditions:

- Operation mode: Backup mode
- Control system/standby system: Control system
- System A/B setting: System A
- Tracking transfer: No execution

Point

By selecting "Yes" for the following option, parameters and programs are automatically written to GX Simulator3 when simulation is started. In this case, the "Online Data Operation" screen does not appear.

- [Tool] ⇒ [Options] ⇒ "Simulation" ⇒ "Start Simulation" ⇒ "Operational Setting" ⇒ "Automatically write programs and parameters when starting simulation."

In addition, if the checkbox in the "Select Favorites Button" column of optional data is selected in the "Set Favorites" screen, the data is also automatically written. (☞ Page 598 Set favorites screen)

Precautions

The following shows the considerations when simulating an RnPCPU (redundant mode) or an RnPSFCPU.

- The following function cannot be performed during simulation.
[Online] ⇒ [Redundant PLC Operation]
- Set the model name of a base unit and its number of slots in the base setting of the system parameter before simulation. Otherwise, a redundant system configuration abnormal error occurs.


Ending a simulation

Operating procedure


Select [Debug] ⇒ [Simulation] ⇒ [Stop Simulation] (🛑).

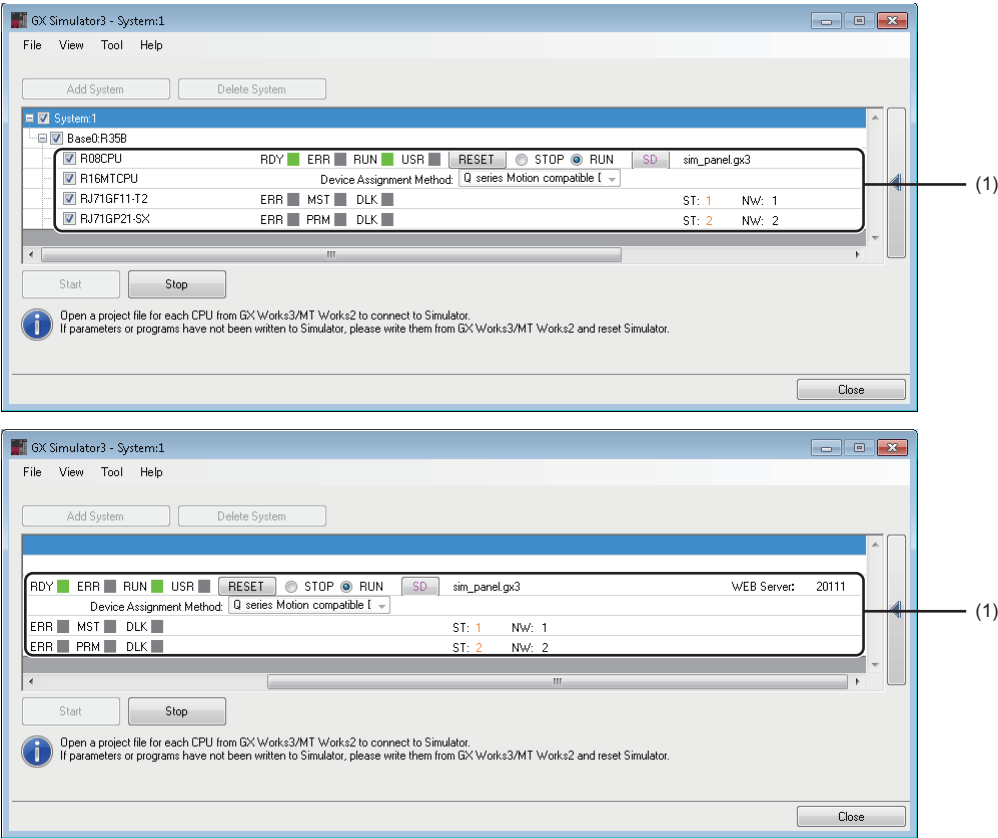
11.3 System Simulation

System simulation can be performed to simulate programs by interacting with other CPU modules and simple motion modules.

Functions using an SD memory card can also be simulated. ( Page 562 SD memory card)

Window





Select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Start System Simulation] ().



| Item | Description |
|-----------|--|
| (1) Panel | The operating status of each module is displayed. Additionally, an operation for each module can be performed. |

Operating procedure

For operating procedures for the system simulation, refer to the following:

- Multiple CPU:  Page 549 Multiple CPU system
- Programmable controller CPU and motion CPU:  Page 552 Programmable controller CPU and motion CPU
- CPU module and simple motion module:  Page 556 Simple motion module/motion module
- Cyclic transmission:  Page 558 Network modules

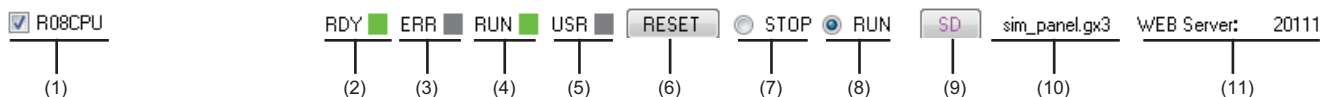
Display contents on a panel

Operating status can be checked and an operation can be changed in a panel for each module in GX Simulator3. The following shows the display content on the panel of a CPU module and a network module.

Window

■Programmable controller CPU

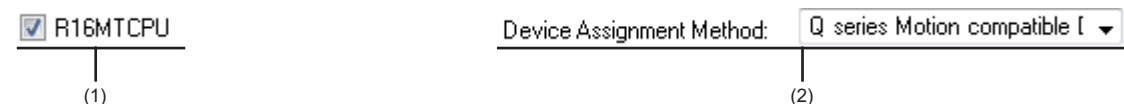
Ex.



| Item | Description |
|-------------------|--|
| (1) Module name | Indicates the model name of the CPU module. |
| (2) RDY | Indicates the 'READY' LED on the front of the CPU module. |
| (3) ERR | Indicates the 'ERROR' LED on the front of the CPU module. |
| (4) RUN | Indicates the 'PROGRAM RUN' LED on the front of the CPU module. |
| (5) USR | Indicates the 'USER' LED on the front of the CPU module. |
| (6) RESET | A button which behaves as RESET switch. |
| (7) STOP | Behaves as STOP switch. |
| (8) RUN | Behaves as RUN switch. |
| (9) SD | A button used for setting a virtual SD memory card file. The color of 'SD' differs depending on whether a file is set or not. <ul style="list-style-type: none"> • Pink: No file is set. • Blue: A file is set. |
| (10) Project name | The project name is displayed. |
| (11) Port number | The port number of GX Simulator3 is displayed. This number is used when simulating the web server function. |

■Motion CPU

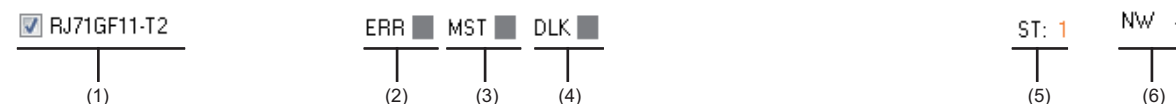
Ex.



| Item | Description |
|------------------------------|--|
| (1) Module name | Indicates the model name of the CPU module. |
| (2) Device Assignment Method | Select a device assignment method for a motion CPU. <ul style="list-style-type: none"> • Q series Motion compatible Device assignment • MELSEC iQ-R Motion Device assignment |

■Network module

Ex.



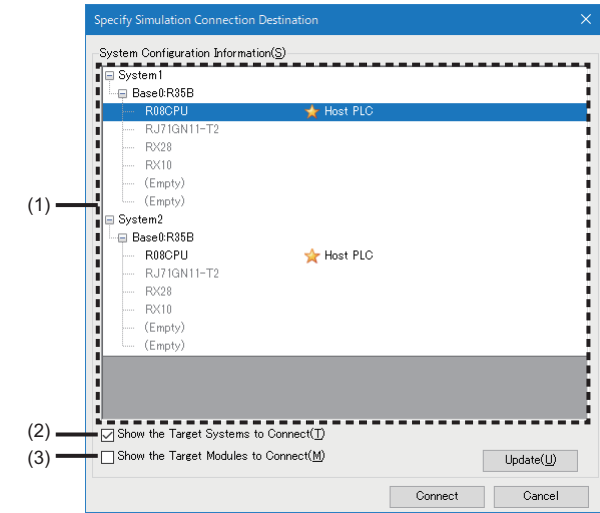
| Item | Description |
|-----------------|--|
| (1) Module name | Indicates the model name of the network module. |
| (2) ERR | Indicates the 'ERROR' LED on the front of the module. |
| (3) MST | Indicates the 'MST' LED on the front of the module. |
| (4) DLK | Indicates the 'D LINK' LED on the front of the module. |
| (5) ST | Indicates the dot matrix LED of the module. Only a station number is displayed on the panel of GX Simulator3. |
| (6) NW | Indicates a network number set in the network parameter. |

Simulation connection destination setting

A connection destination CPU (GX Simulator3) can be set in the "Specify Simulation Connection Destination" screen.

Window

Select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation].



Displayed items

| Item | Description |
|--|--|
| (1) System Configuration Information | Systems added in the GX Simulator3 screen are displayed in a list. |
| (2) Show the Target Systems to Connect | Select this checkbox to display only a system that matches with the system configuration of a project opened in GX Works3 in the system configuration information. By unselecting this checkbox, a system that is different from the system configuration of the project is also displayed. |
| (3) Show the Target Modules to Connect | Select this checkbox to display only a connectable CPU module, base unit on which the CPU module is placed, and system in the system configuration information. |

Operating procedure

For the operation of the "Specify Simulation Connection Destination" screen, refer to the following:

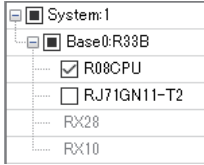
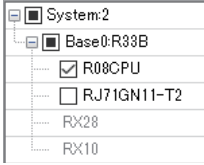
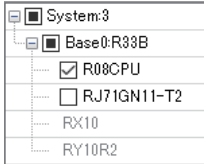
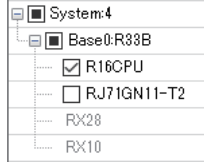
- Multiple CPU: Page 549 Multiple CPU system
- Programmable controller CPU and motion CPU: Page 552 Programmable controller CPU and motion CPU
- CPU module and simple motion module: Page 556 Simple motion module/motion module
- Cyclic transmission: Page 558 Network modules

■Display contents in the system configuration information

The contents displayed in the system configuration information are switched depending on the selection status of "Show the Target Systems to Connect" and "Show the Target Modules to Connect."


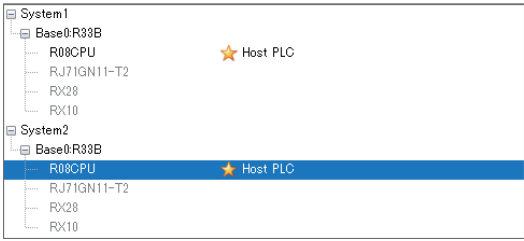
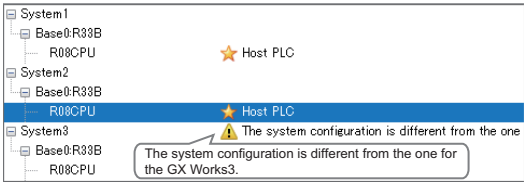
Ex.

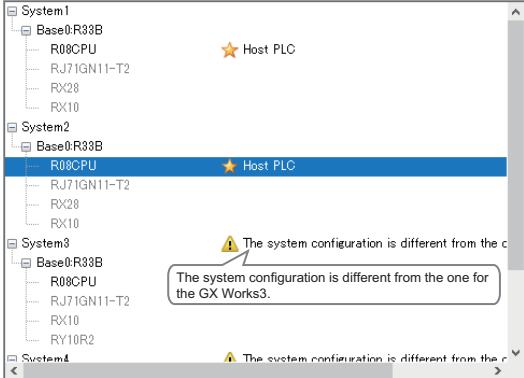
When simulating the systems of (1) to (4)

| (1) Project for R08CPU | (2) Project for R08CPU | (3) Project for R08CPU | (4) Project for R16CPU |
|---|---|---|---|
|  |  <p>Same system configuration with (1)</p> |  <p>Different system configuration from (1)</p> |  |

The following shows the combinations of the selection status and display contents in the system configuration information by using the example of the case when displaying the "Specify Simulation Connection Destination" screen in GX Works3 where the project (1) is opened.

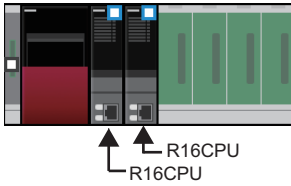
○: Selected, ×: Unselected

| Show the Target Systems to Connect | Show the Target Modules to Connect | Display contents in the system configuration information | Display example |
|------------------------------------|------------------------------------|--|--|
| ○ | ○ | Among the systems that match with the system configuration of a project opened in GX Works3, only the system in which a CPU module whose model name is the same with a CPU module (host CPU) exists is displayed. | Only the system numbers, base units, and CPU modules of (1) and (2) are displayed.  |
| ○ | × | The system that matches with the system configuration of a project opened in GX Works3 is displayed. | The systems of (1) and (2) are displayed.  |
| × | ○ | Among all systems, only the connectable CPU module is displayed. Among the systems that do not match with the system configuration of a project opened in GX Works3, the system in which a CPU module whose model name is the same with a CPU module (host CPU) exists is also displayed. | The system numbers, base units, and CPU module of (1) to (3) are displayed.  |

| Show the Target Systems to Connect | Show the Target Modules to Connect | Display contents in the system configuration information | Display example |
|------------------------------------|------------------------------------|--|--|
| × | × | All systems are displayed. | All systems of (1) to (4) are displayed.  |

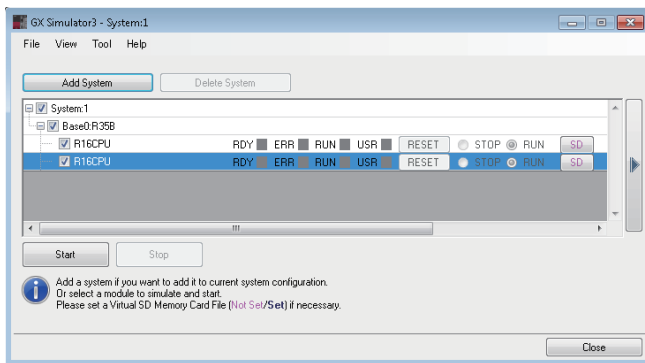
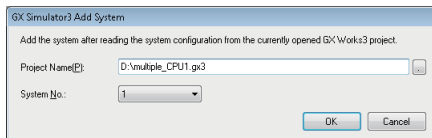
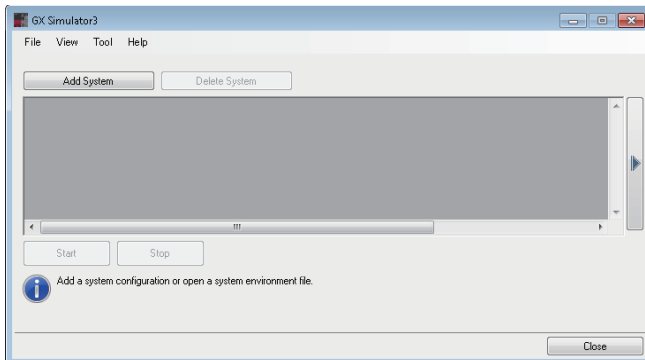
Multiple CPU system

This section shows the operation to simulate a multiple CPU system by using the example of the following system configuration.



Operating procedure

■ Starting GX Simulator3



1. Start GX Simulator3. (☞ Page 544 System Simulation)
2. In the GX Simulator3 screen, click the [Add System] button.

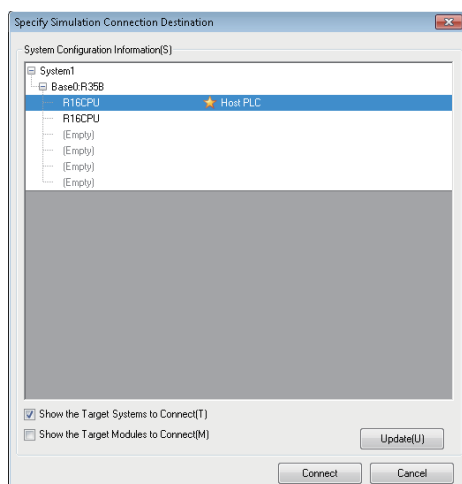
3. In the "GX Simulator3 Add System" screen, set a project name and a system number.

4. In the GX Simulator3 screen, select the checkboxes of the CPU modules to simulate, and click the [Start] button.

For the CPU modules that can be simulated, refer to the following:

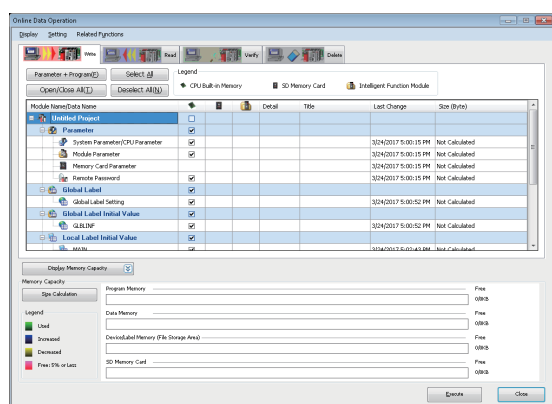
☞ Page 999 Modules supported by GX Simulator3 (System simulation)

■Connecting to the CPU No.1 and writing data



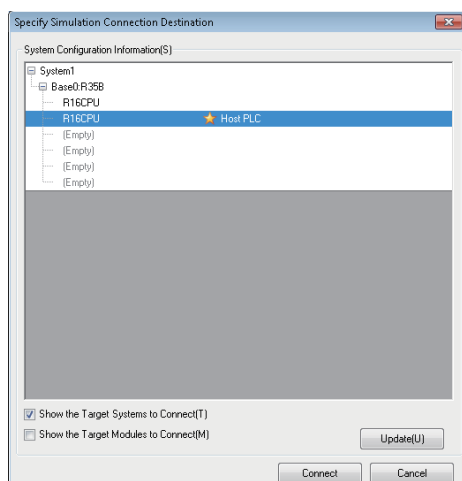
1. Select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation].
2. In the "Specify Simulation Connection Destination" screen, select the CPU No.1, and click the [Connect] button.

"Simulation ((system number).(CPU number)) will be displayed in the status bar.



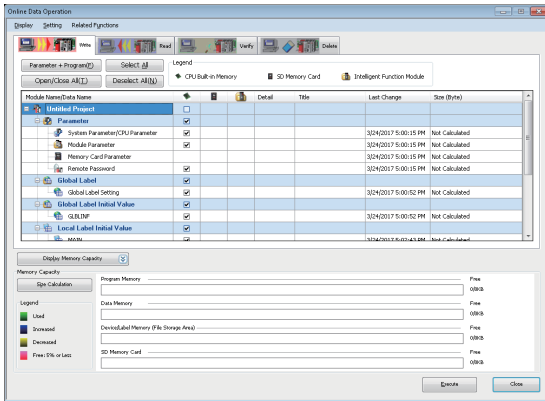
3. Select [Online] ⇒ [Write to PLC] to write parameters and programs in GX Simulator3.

■Connecting to the CPU No.2 and writing data



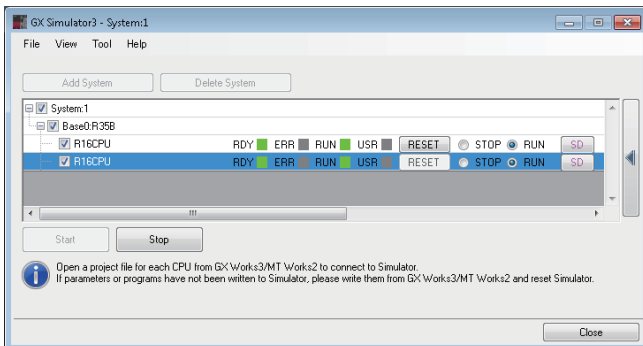
1. Start another GX Works3, and open the project of CPU No.2.
2. Select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation].
3. In the "Specify Simulation Connection Destination" screen, select the CPU No.2, and click the [Connect] button.

"Simulation ((system number).(CPU number))" will be displayed in the status bar of GX Works3.



4. Select [Online] ⇒ [Write to PLC] to write parameters and programs in GX Simulator3.

■ Simulating

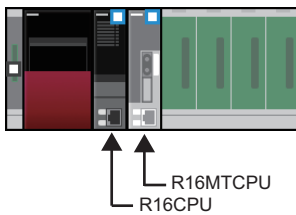


1. In the GX Simulator3 screen, click the [RESET] button in the row of the CPU No.1.
 2. Select "RUN" in the row of each CPU.
 3. Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring].
- The system simulation starts.

Programmable controller CPU and motion CPU

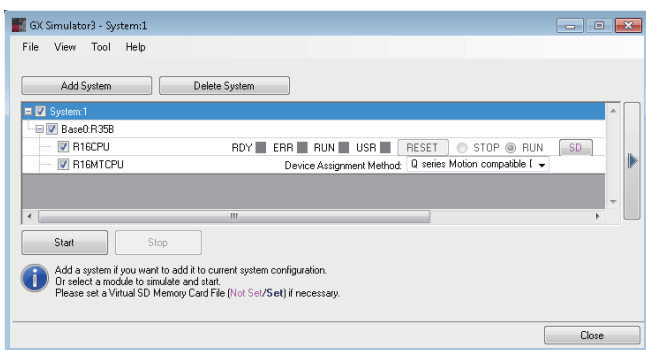
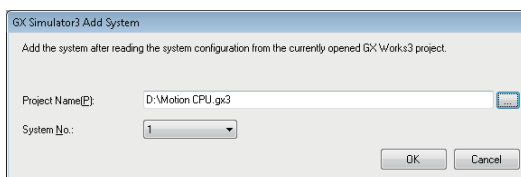
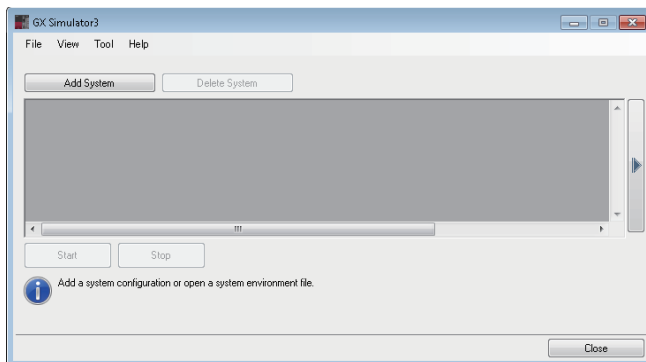
This section shows the operation to simulate a system including a programmable controller CPU and a motion CPU by using the example of the following system configuration.


To use this function, MT Works2 Version 1.140W or later is required to be installed.



Operating procedure

■Starting GX Simulator3 and MT Simulator2




1. Start GX Simulator3. ( Page 544 System Simulation)
2. In the GX Simulator3 screen, click the [Add System] button.

3. In the "GX Simulator3 Add System" screen, set a project name and a system number.

4. In the GX Simulator3 screen, select the checkboxes of a programmable controller CPU and a motion CPU to simulate.

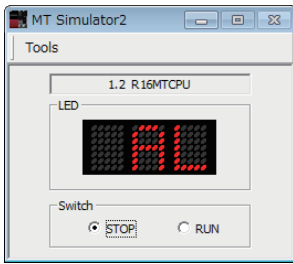
For the programmable controller CPUs and motion CPUs that can be simulated, refer to the following:

 Page 999 Modules supported by GX Simulator3 (System simulation)

5. Select "Q series Motion compatible Device assignment" or "MELSEC iQ-R Motion Device assignment " for "Device Assignment Method" of the motion CPU, and click the [Start] button.

For details on the device assignment method, refer to the following:

 MELSEC iQ-R Motion Controller Programming Manual (Common)

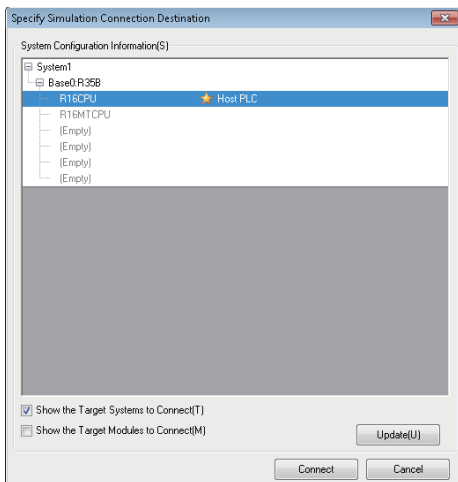


MT Simulator2 starts.

■Connecting to a programmable controller CPU and writing data

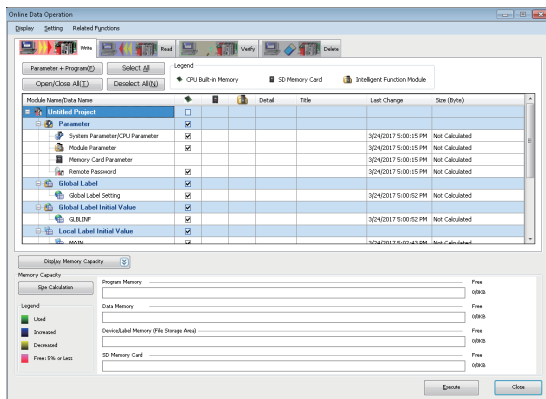
1. Select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation].
2. In the "Specify Simulation Connection Destination" screen, select the programmable controller CPU, and click the [Connect] button.

"Simulation ((system number).(CPU number))" will be displayed in the status bar of GX Works3.

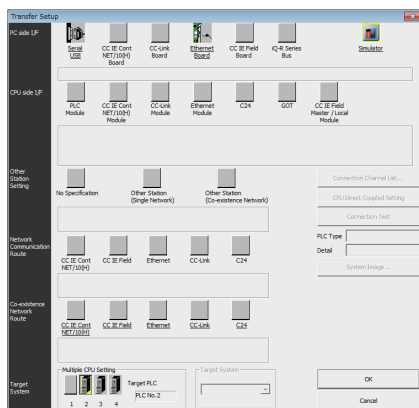


3. Select [Online] ⇒ [Write to PLC].

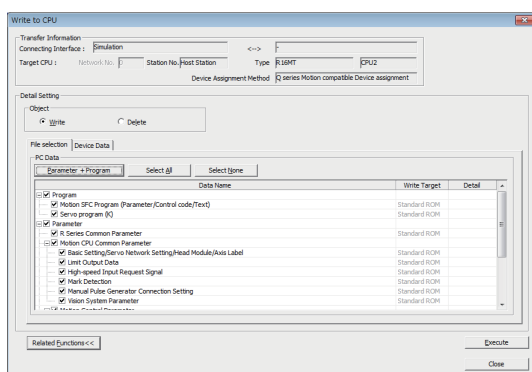
Write the parameters and programs to GX Simulator3.



■Connecting to a motion CPU and writing data

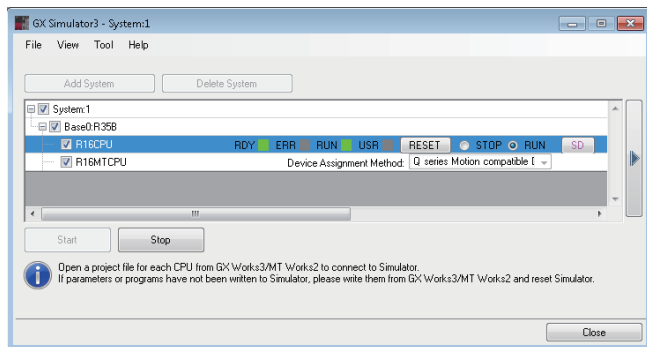


1. Start MT Developer2, and open the project of a motion CPU to simulate.
2. Select [Online] ⇒ [Transfer Setup].
3. In the "Transfer Setup" screen, double-click "Simulator" for "PC side I/F."
4. In the "System No. Setting" screen, specify the system number, which was set in the step 3, for "System No."
5. In the "Transfer Setup" screen, specify the motion CPU number for "Multiple CPU Setting."
6. In the "Transfer Setup" screen, click the [OK] button. MT Simulator2 already started is connected.

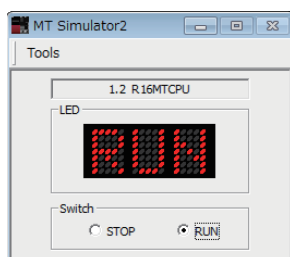


7. Select [Online] ⇒ [Write to Motion]. Write the parameters and programs to MT Simulator2.

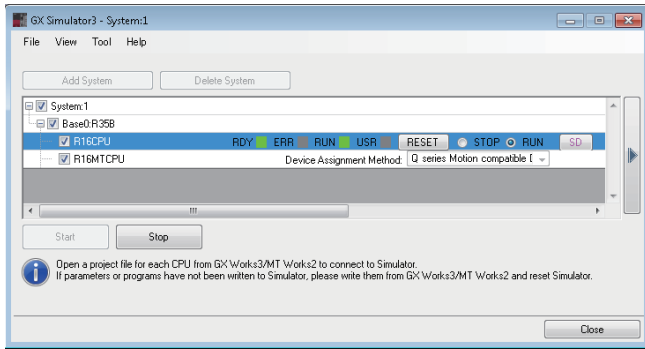
■Simulating



1. In the GX Simulator3 screen, click the [RESET] button in the row of a programmable controller CPU.
2. In the GX Simulator3 screen, select "RUN" in the row of a programmable controller CPU.



3. In the "MT Simulator2" screen, select "RUN."



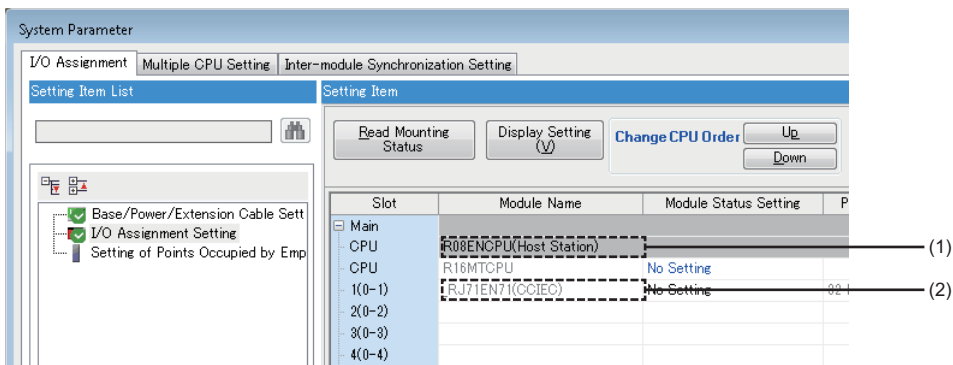
4. Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] on GX Works3.

The system simulation starts.

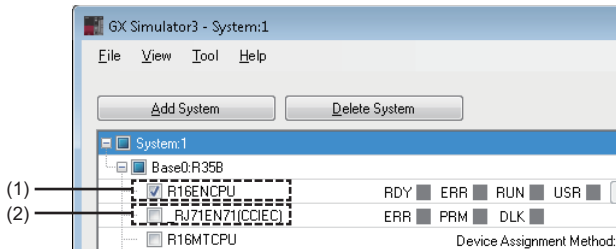
Precautions

In the simulation of a multiple CPU system where an RnENCPU is set as CPU No.1, the place of modules in the "System Parameter" screen and in the GX Simulator3 screen are differently displayed.

"System Parameter" screen



GX Simulator3 screen



(1): RnENCPU(CPU part)

(2): RnENCPU (network part)

For details on the multiple CPU configuration using an RnENCPU, refer to the following:

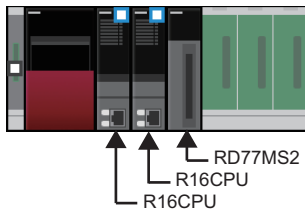
MELSEC iQ-R Module Configuration Manual

Simple motion module/motion module

This section shows the operation to simulate a system including a simple motion module or a CC-Link IE TSN compatible motion module by using the example of the following system configuration.

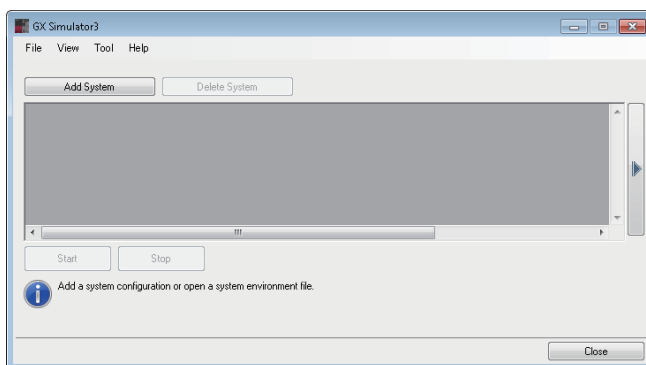
Ex.

System including a simple motion module

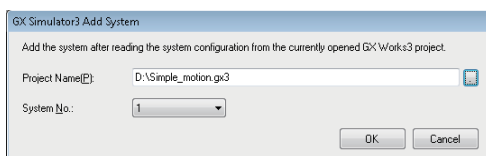


Operating procedure

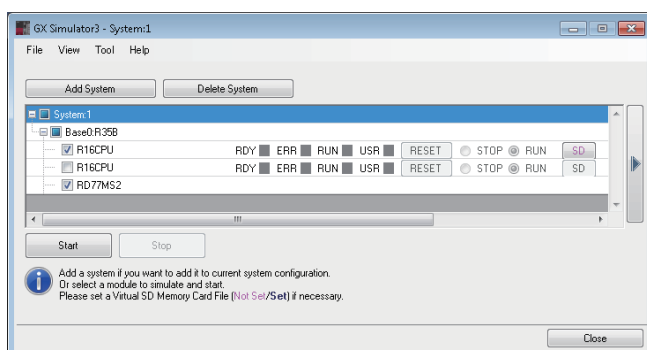
■ Starting GX Simulator3



1. Start GX Simulator3. (☞ Page 544 System Simulation)
2. In the GX Simulator3 screen, click the [Add System] button.



3. In the "GX Simulator3 Add System" screen, set a project name and a system number.

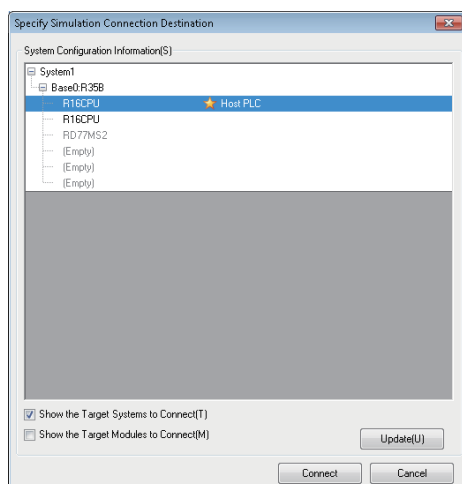


4. In the GX Simulator3 screen, select the checkboxes of the following modules to simulate, and click the [Start] button.

- CPU module
- Simple motion module/CC-Link IE TSN compatible motion module

For the modules that can be simulated, refer to the following:
☞ Page 999 Modules supported by GX Simulator3 (System simulation)

■ Starting SMM Simulator, connecting to a CPU module, and writing data

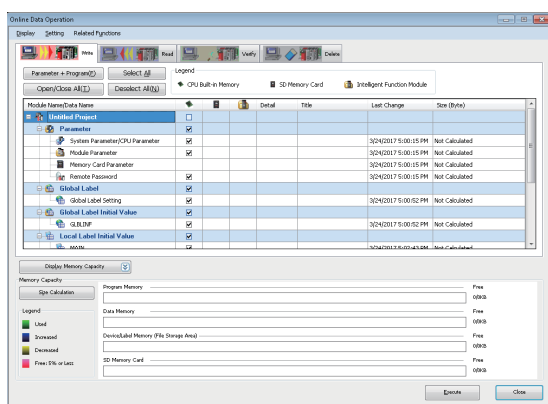


1. Select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation].

2. In the "Specify Simulation Connection Destination" screen, select the CPU module the checkbox of which was selected in the GX Simulator3 screen, and click the [Connect] button.

"Simulation ((system number).(CPU number))" will be displayed in the status bar of GX Works3.

SMM Simulator (simulator of a simple motion module) starts. If the checkbox of a CC-Link IE TSN compatible motion module is selected in the GX Simulator3 screen, MU Simulator starts.

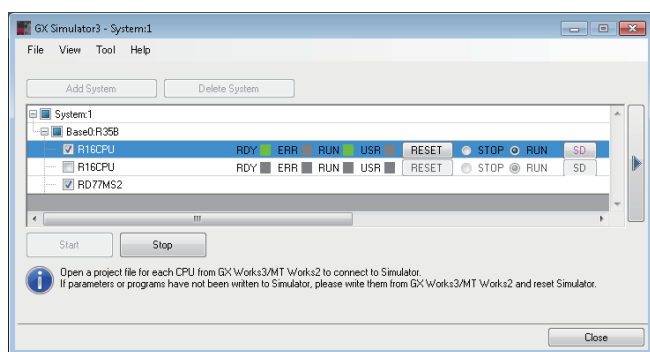


3. Select [Online] ⇒ [Write to PLC].

4. Write the following data to GX Simulator3.

- Parameters
- Programs
- Module parameters of a simple motion module/CC-Link IE TSN compatible motion module

■ Simulating



1. In the GX Simulator3 screen, click the [RESET] button in the row of a CPU module.

2. In the GX Simulator3 screen, select "RUN" in the row of a CPU module.

3. Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring].

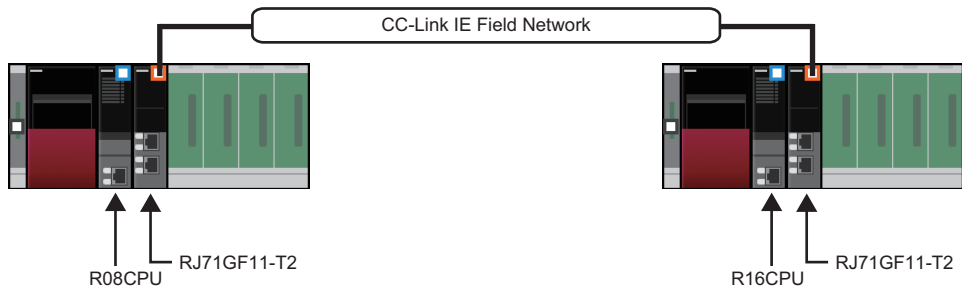
The system simulation starts.

Network modules

This section shows the operation to simulate multiple systems including network modules, which perform cyclic transmission or transient transmission, by using the example of the following system configuration.

Ex.

Module configuration diagram



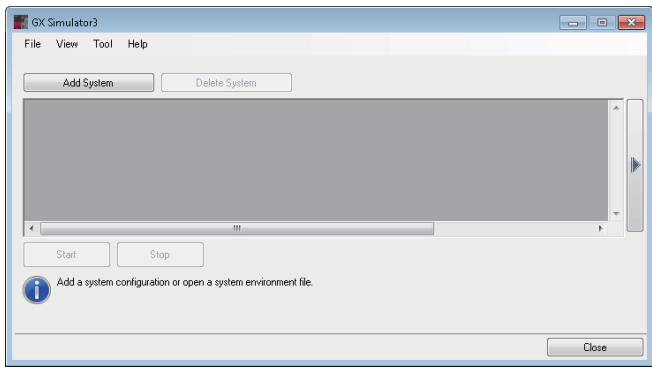
"I/O Assignment Setting" of "System Parameter"

| Slot | Project of master station | Project of local station |
|------|---------------------------|--------------------------|
| CPU | R08CPU (host CPU) | R16CPU (host CPU) |
| 0 | RJ71GF11-T2 | RJ71GF11-T2 |
| 1 | Empty | Empty |
| 2 | Empty | Empty |
| 3 | Empty | Empty |
| 4 | Empty | Empty |

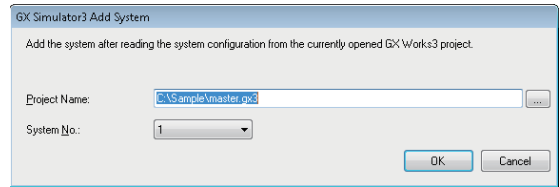
To simulate network modules, set the module parameters of the network modules to link each other.

Operating procedure

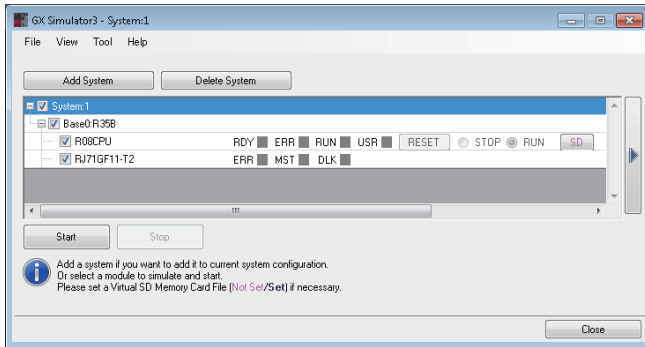
■Starting GX Simulator3



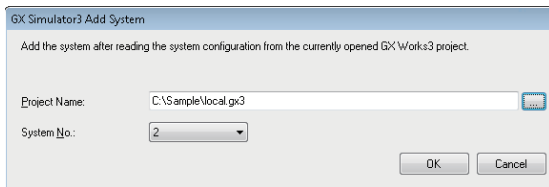
1. Open the project of a master station in GX Works3.
2. Start GX Simulator3. (Page 544 System Simulation)
3. In the GX Simulator3 screen, click the [Add System] button.



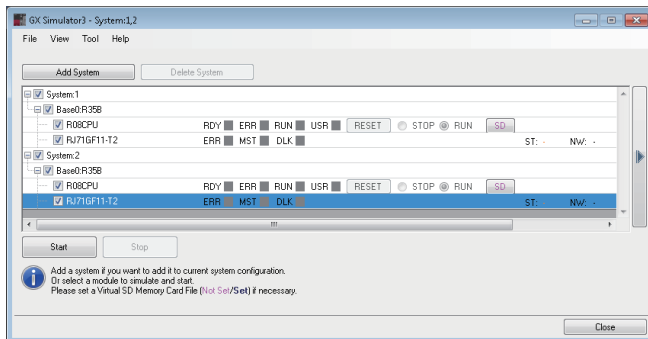
4. In the "GX Simulator3 Add System" screen, set a project name and a system number.



5. Start another GX Works3, and open the project of a local station.
6. In the GX Simulator3 screen, click the [Add System] button.



7. In the "GX Simulator3 Add System" screen, set a project name and a system number.

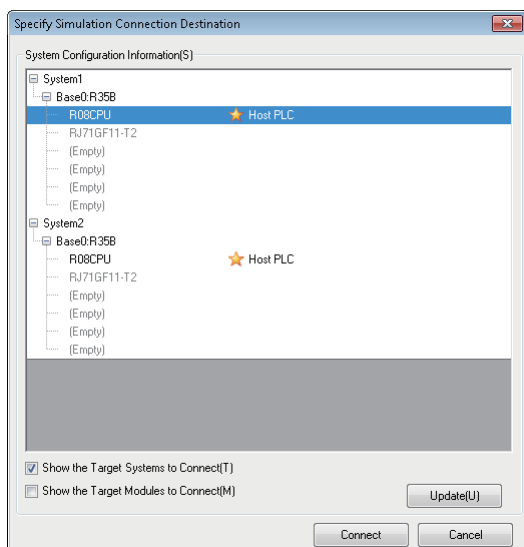


8. In the GX Simulator3 screen, select the checkboxes of the CPU modules and network modules to simulate, and click the [Start] button.

For the CPU modules and network modules that can be simulated, refer to the following:

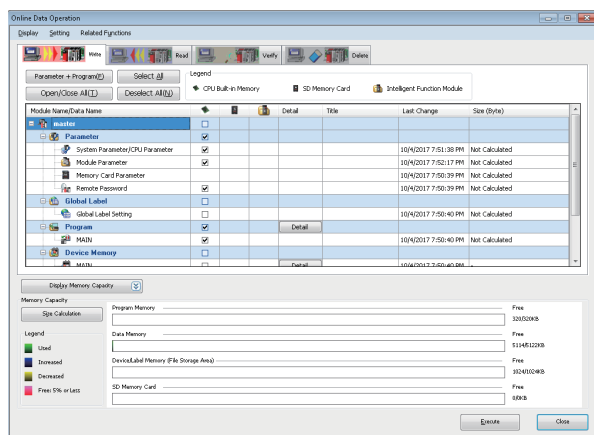
☞ Page 999 Modules supported by GX Simulator3 (System simulation)

■Connecting to a programmable controller CPU and writing data

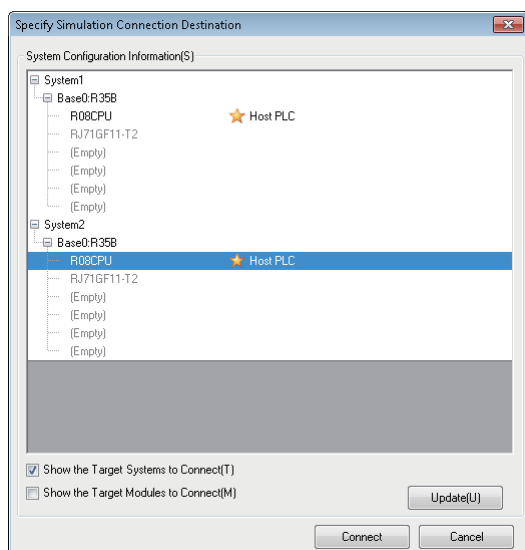


1. In GX Works3 used in step 1, select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation].
2. In the "Specify Simulation Connection Destination" screen, select the CPU module of the master station, and click the [Connect] button.

"Simulation ((system number).(CPU number))" will be displayed in the status bar of GX Works3.

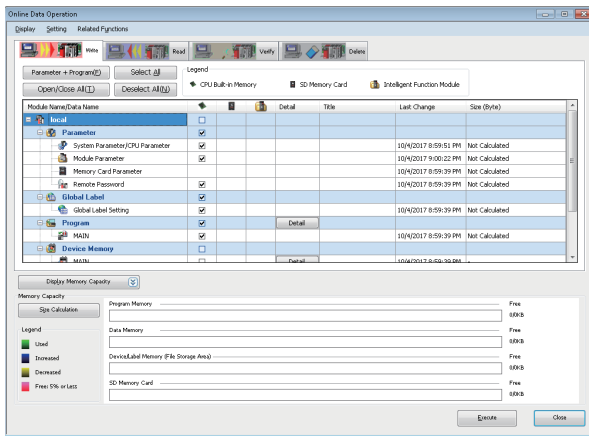


3. Select [Online] ⇒ [Write to PLC] to write parameters and programs in GX Simulator3.



4. In GX Works3 used in step 5, select [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation].
5. In the "Specify Simulation Connection Destination" screen, select the CPU module of a local station, and click the [Connect] button.

"Simulation ((system number).(CPU number))" will be displayed in the status bar of GX Works3.



6. Select [Online] ⇒ [Write to PLC] to write parameters and programs in GX Simulator3.

■ Simulating



1. In the GX Simulator3 screen, click the [RESET] button in the row of the CPU module of a local station.
2. In the GX Simulator3 screen, select "RUN" in the row of the CPU module of a local station.
3. In the GX Simulator3 screen, click the [RESET] button in the row of the CPU module of the master station.
4. In the GX Simulator3 screen, select "RUN" in the row of the CPU module of the master station.
5. In both GX Works3 projects which control each of the master station and the local station, select [Online] ⇒ [Monitor] ⇒ [Start Monitoring].

The system simulation starts.

Precautions

For the considerations for a simulation of network modules, refer to the following:

☞ Page 1043 Simulation of network modules

SD memory card

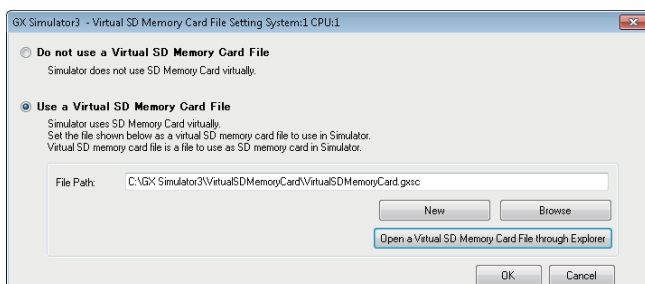
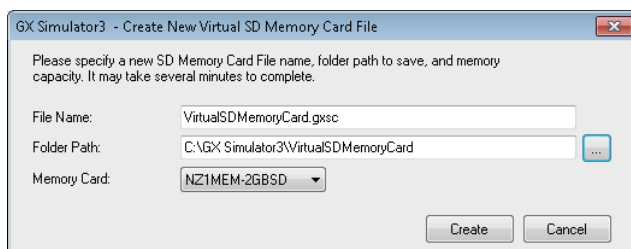
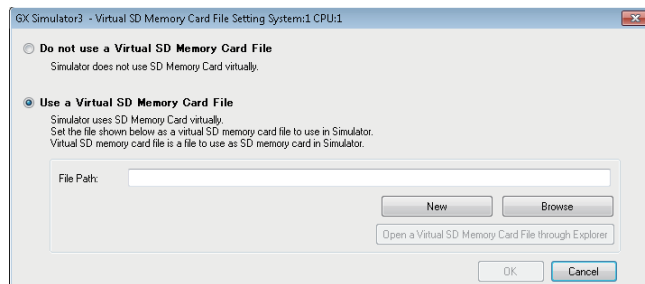
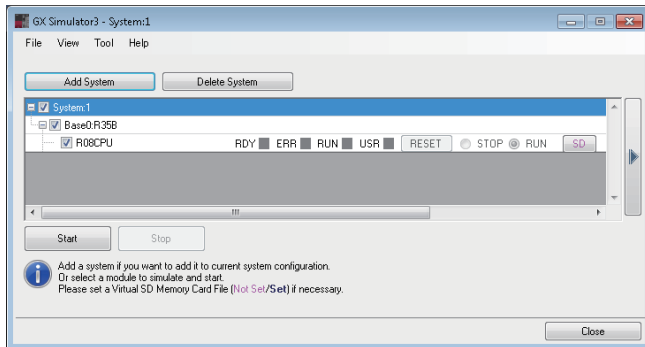
Functions using an SD memory card can be simulated by creating a 'virtual SD memory card file (*.gxsc).'

'Virtual SD memory card file' refers a file which is used as an SD memory card during a simulation.

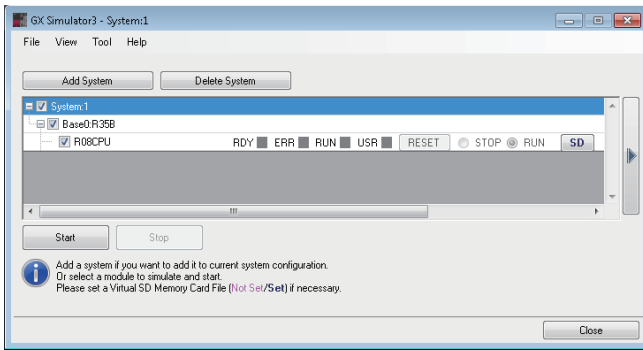
Data saved in an SD memory card or any folders can be copied in a virtual SD memory card file. Copy files necessary for a function to be simulated.

Operating procedure

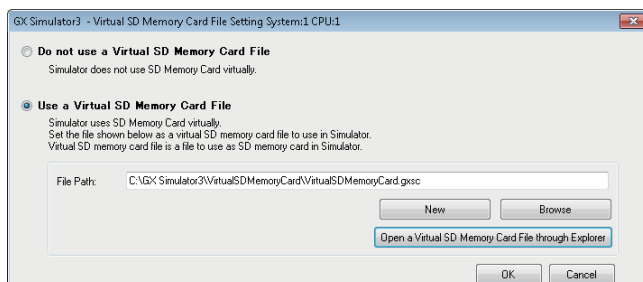
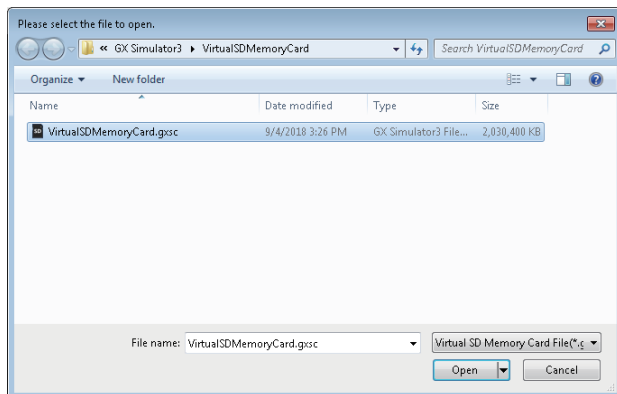
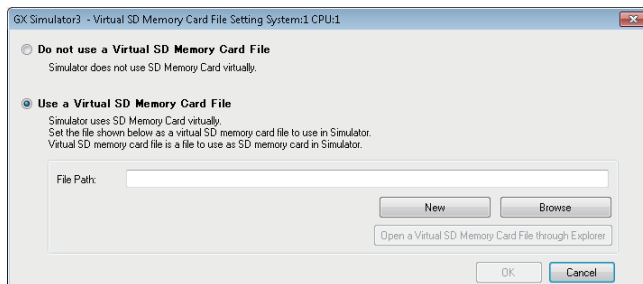
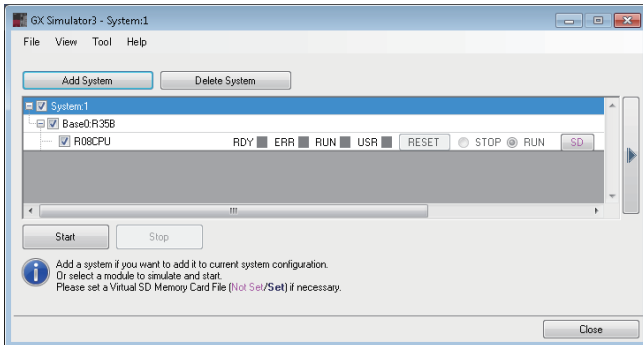
■Creating a virtual SD memory card file



1. Start GX Simulator3. (👉 Page 544 System Simulation)
2. Click the [SD] button of a CPU module in which a virtual SD memory card file is used.
3. In the "Virtual SD Memory Card File Setting" screen, select "Use a Virtual SD Memory Card File."
4. Click the [New] button.
5. In the "Create New Virtual SD Memory Card File" screen, set each item.
6. Click the [Create] button.
7. In the "Virtual SD Memory Card File Setting" screen, check that the file path of the virtual SD memory card file is displayed.
8. Click the [OK] button.



■Using a created virtual SD memory card file



9. In the GX Simulator3 screen, select the checkbox of the CPU module to simulate, and click the [Start] button.

1. Start GX Simulator3. (☞ Page 544 System Simulation)

2. Click the [SD] button of a CPU module in which a virtual SD memory card file is used.

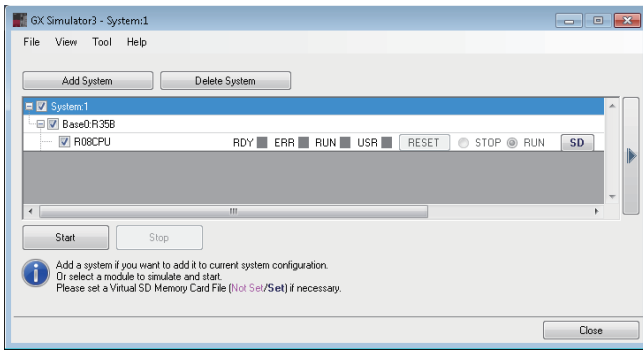
3. In the "Virtual SD Memory Card File Setting" screen, select "Use a Virtual SD Memory Card File."

4. Click the [Browse] button.

5. In the displayed screen, select a file and click the [Open] button.

6. In the "Virtual SD Memory Card File Setting" screen, check that the file path of the virtual SD memory card file is displayed.

7. Click the [OK] button.



8. In the GX Simulator3 screen, select the checkbox of the CPU module to simulate, and click the [Start] button.

Restriction

The maximum size of a creatable virtual SD memory card file depends on the combination of the version of Windows and the file system of the disk.

Therefore, it may fail to create a virtual SD memory card file regardless of the free space on the disk.

Point

A virtual SD memory card file can be opened on the explorer by clicking the [Open a Virtual SD Memory Card File through Explorer] button in the "Virtual SD Memory Card File Setting" screen.

In the opened file, data that cannot be written or read by operating in the "Online Data Operation" screen, such as the user web page created by using the web server function, can be saved.

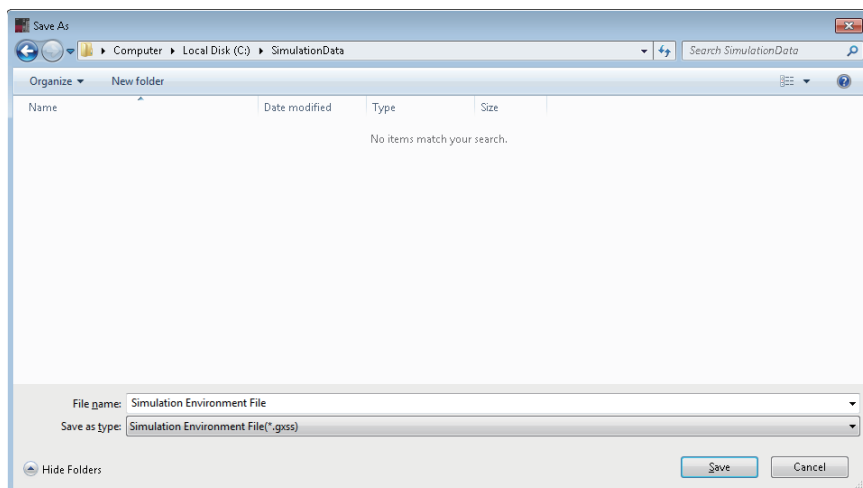
Saving a simulation environment file

The system configuration added to the system simulation and data written in GX Simulator3 can be saved as a simulation environment file.

Before saving data, stop all simulations.

Window

Select [File] ⇒ [Save Simulation Environment] in the GX Simulator3 screen.



Operating procedure

Set each item and click the [Save] button.

Data list

The following data written to GX Simulator3 is saved as a simulation environment file.

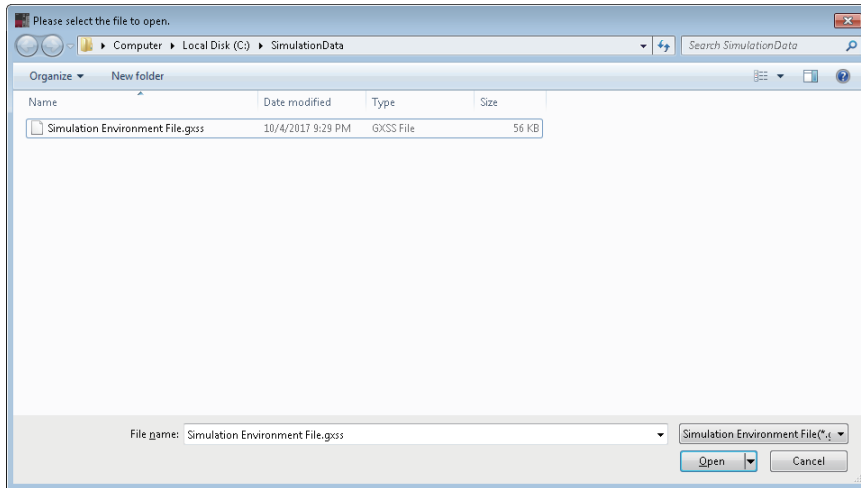
| Module type | Data |
|--|---|
| PLC CPU | System parameter, CPU parameter, module parameter, module extended parameter, remote password, global label setting, global label assignment information, program file, FB file, FUN file, initial label value file, file register, initial device value, device comment, device/label within a latch range, event history, device data storage file |
| Motion CPU | Program, parameter, backup data, history of current value, event history, device within a latch range |
| Simple motion | Positioning data, block start data, parameter, servo parameter (RD77MS, FX5-40SSC-S, and FX5-80SSC-S only), mark detection, synchronous control parameter, cam data, backup data |
| CC-Link IE TSN compatible motion module | Motion program, FB/FUN, CLASS, motion program execution condition, label setting, label default value setting, interface type definition, structure type definition, enumeration type definition, operation profile (csv format), operation profile (zip format), project control data for engineering tool, motion event history, position data history file, boot log, boot log (at previous startup), module extended parameter open information, logging setting file (json format), logging data file (csv format), logging data file (json format), axis absolute position data |
| CC-Link IE TSN compatible motion module (simple motion mode) | Positioning data, block start data, parameter, mark detection, synchronous control parameter, cam data, backup data, event history, label setting, global label assignment information, label default value setting |

Opening a simulation environment file

A simulation environment can be restored by opening a saved simulation environment file.

Window

Select [File] ⇒ [Open Simulation Environment] in the GX Simulator3 screen.



Operating procedure

Select a simulation environment file to open, and click the [Open] button.

Precautions

If the contents of the restored simulation environment and the project connected do not match, an error may occur in GX Simulator3.

After opening a simulation environment file, check if the data of GX Simulator3 and the project match by using the verification function.

When the verification result is a mismatch, data in GX Simulator3 and the project data can be matched using 'Read from PLC.'

Ending a system simulation

Operating procedure

Click the [Close] button in the GX Simulator3 screen.

Point

To disconnect with the virtual system without closing the GX Simulator3 screen, perform the following operation.

- [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Disconnect Simulation]

When restarting the system simulation, perform the following operation.

- [Debug] ⇒ [Simulation] ⇒ [System Simulation] ⇒ [Connect Simulation]

11.4 Simulation of External Device Operations

This section explains the method for debugging a program by using the I/O system setting function.

I/O System Setting functions

The I/O System Setting is a function to enable a debug by simulating operations of input/output devices (without changing a program.)

11

Precautions

- When the simulator is in STOP, the I/O system setting function does not run. At the timing of STOP to RUN, it starts performing from the beginning of the conditions described in the I/O system setting data.
- Since a label is acquired from a project being open at the first execution time of the I/O System Setting, the label that edited and written to the simulator after startup is not applied. Close the "I/O System Setting" screen and start it again.

Execution procedure of I/O System Setting function

1. Start GX Simulator3. (☞ Page 542 Simulation)
2. Set GX Simulator3 to "STOP."
3. Display the "I/O System Setting" screen. (☞ Page 568 Executing I/O System Setting function)
4. Output the template file of the setting data. (☞ Page 569 Outputting the template of setting data)
5. Edit the outputted file. (☞ Page 570 Creating setting data)
6. Register devices/labels to monitor in a watch window. (☞ Page 658 Checking Current Values by Registering Devices/Labels)
7. Open the edited file. (☞ Page 574 Opening setting data)
8. The following shows the procedure to run an I/O system. (☞ Page 574 Executing the I/O system)
9. Set GX Simulator3 to "RUN."

Executing I/O System Setting function

Set the devices to be used in the I/O System Setting, then execute the simulation.

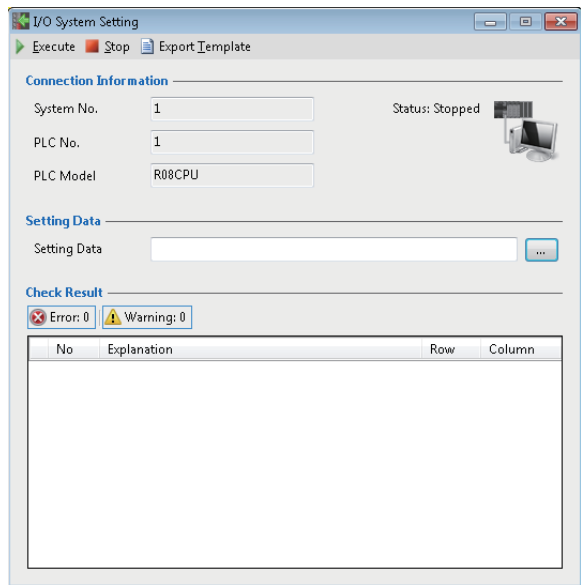
Window

■Simulation of a CPU module

Select [Tool] ⇒ [I/O System Setting] in the GX Simulator3 screen.

■System simulation

- 1. Select [Tool] ⇒ [Start I/O System Setting] in the GX Simulator3 screen.
The "GX Simulator3 I/O System Setting" screen appears.
- 2. Set each items in the "GX Simulator3 I/O System Setting" screen, and click the [OK] button.



Outputting the template of setting data

The following shows the procedure to output a template for I/O system setting data.

Operating procedure

Select the [Export Template] on the "I/O System Setting" screen.

The template for I/O system setting data is output as a CSV format file (template file).

■Template file

Window

| | | | | | |
|-----|---------------------------|-------------|--|------------|--------------|
| (1) | //I/O System Setting Data | | | | |
| | //Control Record | | | | |
| | //Record Type | Comment | GX Works3 Project Path | PLC No. | Reserve |
| | 1 | | C:\Users\PROJECT1\gx3 | | |
| (2) | //Data Record | | | | |
| | //Record Type | Setting No. | Conditions | Timer (ms) | Output |
| | //2 | 1 | Y0=TRUE AND (Y1=TRUE OR LDP(TRUE, Y2)) | 100 | X0:=TRUE |
| | //2 | | | | D0:=100 |
| | //2 | 2 | Label1=TRUE AND Label2=TRUE | 50 | Label3:=TRUE |
| | //2 | | | | Label4:=200 |
| | //2 | 3 | LDP(TRUE, Y3) | 0 | X1:=TRUE |
| | //2 | | | | D10:=10 |
| | //2 | 4 | INIT | 1000 | X101:=TRUE |
| | //2 | 5 | Y0=TRUE | 100 | X0.10:=TRUE |
| (3) | //End Record | | | | |
| | //Record Type | Reserve | | | |
| | 3 | | | | |

Displayed items

| Item | | Description | |
|--------------------|------------------------|--|--|
| | | Output | Edit ^{*1} |
| (1) Control record | Record Type | '1' (value indicating the control record) is output. | Enter '1.' (Required) |
| | Comment | A comment is output. | Enter a comment (Up to 50 characters). |
| | GX Works3 Project Path | The path of the GX Works3 project running a simulator is output. | Enter the path of the GX Works3 project running a simulator. |
| | PLC No. | A CPU number (1 to 8) is output. | Enter a CPU number (1 to 8). |
| | Reserve | — | |
| (2) Data record | Record Type | '2' (value indicating the data record) is output. | Enter '2.' |
| | Setting No. | A number (1 to 1023) set for a condition is output in ascending order. | Enter a number (1 to 1023) for a condition in ascending order. (Required) When setting multiple pieces of output for one condition, enter the same number to each of them. |
| | Conditions | Conditions delimited by a space are output. | Enter a condition (up to 256 characters) delimited by a space. (Required only for the first cell) Up to six conditions can be combined in logical operation. |
| | Timer (ms) | The delay time (-1 to 1000) from when a condition is satisfied to when an instruction is executed is output. | Enter the delay time (-1 to 1000) from when a condition is satisfied to when an instruction is executed. (Required only for the first row) • When entering both 'CONTINUE' as a condition and '-1' as an input timer, the output differs for every scan under the same condition. ^{*2} • When using a process response operation, enter '*'. ^{*2} |
| | Output | An output formula is output (up to 100 characters). | Enter an output formula (up to 100 characters). (Required) When setting multiple pieces of output for one condition, enter the second or subsequent output formula to the next line. Up to 50 output formulas can be entered for each setting number. |
| | Reserve | — | |

| Item | | Description | Edit*1 |
|----------------|-------------|--|-----------------------|
| | | Output | |
| (3) End record | Record Type | '3' (value indicating the end record) is output. | Enter '3.' (Required) |
| | Reserve | — | |

*1 When creating setting data by editing the template file, edit the file by following the descriptions in this column.

*2 The following shows the description example when combining 'CONTINUE' and '-1.'

2,1,Y0=TRUE, 1, X0:=TRUE (Only the first scan is performed.)


2,2,CONTINUE, -1, X1:=FALSE (Only the second scan is performed.)

2,3,CONTINUE, -1, X2:=FALSE (Only the third scan is performed.)

Creating setting data

The following shows the procedure to create setting data by editing the template file.

Operating procedure

Open the template file output in spreadsheet software or the like, and directly edit the items in the file. ( Page 569 Template file)

For devices/labels available in editing a template file, refer to the following:

 Page 575 Available devices/labels

Ex.

Example for editing a template file

| | | | | | |
|---------------------------|-------------|--|------------|--|---------|
| //I/O System Setting Data | | | | | |
| //Control Record | | | | | |
| //Record Type | Comment | GX Works3 Project Path | PLC No. | Reserve | |
| 1 | | C:\Users\PROJECT1_gx3 | | | |
| //Data Record | | | | | |
| //Record Type | Setting No. | Conditions | Timer (ms) | Output | Reserve |
| //2 | 1 | Y0=TRUE AND (Y1=TRUE OR LDP(TRUE, Y2)) | 100 | X0:=TRUE | (1) |
| //2 | 1 | | | D0:=100 | |
| //2 | 2 | Label1=TRUE AND Label2=TRUE | 50 | Label3:=TRUE | (2) |
| //2 | 2 | | | Label4:=200 | |
| //2 | 3 | LDF(TRUE, Y3) | 0 | X1:=TRUE | (3) |
| //2 | 3 | | | D10:=10 | |
| //2 | 4 | INIT | 1000 | X101:=TRUE | (4) |
| //2 | 5 | Y0=TRUE | 100 | X0.10:=TRUE | (5) |
| //2 | 6 | CONTINUE | 1000 | D100.D:=D100.D+65536 | (6) |
| //2 | 7 | M0 | 0 | D20.E:=INT_TO_REAL(wLabel5) | (7) |
| //2 | 8 | M0 | * | D22.E:=LAG_DED(0,100,0,100,60,0,D20.E) | (8) |
| //2 | 9 | M0 | 0 | eLabel6:=D22.E | (9) |
| //End Record | | | | | |
| //Record Type | Reserve | | | | |
| 3 | | | | | |

| Item | Example | Notation in a template file |
|--|---|--|
| (1) Basic device setting | When 'Y0' is turned ON and 'Y1' is also turned ON, or 'Y0' is turned ON and 'Y2' rises, after 100 milliseconds, 'X0' turns ON. '100' is assigned to 'D0' | 2,1,"Y0=TRUE AND (Y1=TRUE OR LDP(TRUE, Y2))",100,X0:=TRUE, 2,1,,,D0:=100, |
| (2) Label specification | When 'Label1' is turned ON and 'Label2' is also turned ON, after 50 milliseconds, 'Label3' turns ON. '200' is assigned to 'Label4.' | 2,2,Label1=TRUE AND Label2=TRUE,50,Label3:=TRUE, 2,2,,,Label4:=200, |
| (3) Instant specification | When 'Y3' falls, 'X1' turns ON immediately. '10' is assigned to 'D10.' | 2,3,"LDF(TRUE, Y3)",0,X1:=TRUE, 2,3,,,D10:=10, |
| (4) After initialization specification | After 1 second from execution, 'X101' turns ON. | 2,4,INIT,1000,X101:=TRUE, |
| (5) Successive bit device output | When 'Y0' is turned ON, after 100 milliseconds, 'X0' to 'X10' turn ON. | 2,5,Y0=TRUE,100,X0..10:=TRUE, |
| (6) Timing chart 32-bit integer addition output | '65536' is added to 'D100' after 1 second from the above pattern. | 2,6,CONTINUE,1000,D100.D:=D100.D+65536, |
| (7) Conversion from 16-bit integer to double precision | When 'M0' is ON, the data type of 'wLabel5' is converted from 16-bit integer to single precision. The converted value is assigned to 'D20.' | 2,7,M0,0,D20.E:=INT_TO_REAL(wLabel5), |
| (8) Process response operation | LAG_DED operation is executed every one second. • D20: Input value • D22: Output value | 2,8,M0,*,"D22.E:=LAG_DED(0,100,0,100,60,0,D20.E)", |
| (9) Substitution of a device value to a label value | The value of 'D22' is assigned to 'eLabel6.' | 2,9,M0,0,eLabel6:=D22:E, |

Set the conditions by using the following character strings and symbols.

○: Available, ×: Not available

| Category | String/Symbol | Description | Availability | | | | Usage example | |
|-------------|--------------------------------|--|---------------|--------|--------|---------------------|--|-------------|
| | | | Condi tion | Output | Device | | | |
| | | | | | Bit | Word | | |
| Instruction | CONTINUE ^{*1,*2} | Keeps the previous condition | ○ | × | × | × | 2,1,Y0=TRUE,1,X0:=TRUE | |
| | LOOP ^{*1,*3} | Repeats (It is used with "CONTINUE") | × | ○ | × | × | 2,2,CONTINUE,1,X0:=FALSE 2,3,CONTINUE,1,LOOP | |
| | INIT ^{*1,*4} | Executes after initialization only one time | ○ | × | × | × | 2,1,INIT,1,X0:=TRUE | |
| | LDP ^{*5} | LDP function | ○ | × | ○ | × | LDP(TRUE,Y0) | |
| | LDF ^{*5} | LDF function | ○ | × | ○ | × | LDF(TRUE,Y0) | |
| | DIRECT ^{*6} | Process response operation: direct connection | × | ○ | × | ○ | D22:E := DIRECT(0, 100, 0, 100, D20:E) | |
| | REVERSE ^{*6} | Process response operation: direct connection (output inversion) | × | ○ | × | ○ | D22:E := REVERSE(0, 100, 0, 100, D20:E) | |
| | LAG_DED ^{*6} | Process response operation: primary delay + dead time | × | ○ | × | ○ | D22:E := LAG_DED(0, 100, 0, 100, 60, 0, D20:E) | |
| | LAG_DED_REV ^{*6} | Process response operation: primary delay + dead time (output inversion) | × | ○ | × | ○ | D22:E := LAG_DED_REV(0, 100, 0, 100, 60, 0, D20:E) | |
| | INT_TO_REAL ^{*6} | Converts 16-bit integer to single precision | × | ○ | × | ○ | D0:E:=INT_TO_REAL(1) D0:E:=INT_TO_REAL(W0) D0:E:=INT_TO_REAL(wLabel1) | |
| | REAL_TO_INT ^{*6,*7} | Converts single precision to 16-bit integer | × | ○ | × | ○ | D0:=REAL_TO_INT(1.5) D0:=REAL_TO_INT(W0:E) D0:=REAL_TO_INT(eLabel1) | |
| | DINT_TO_REAL ^{*6} | Converts 32-bit integer to single precision | × | ○ | × | ○ | D0:E:=DINT_TO_REAL(1) D0:E:=DINT_TO_REAL(W0:D) D0:E:=DINT_TO_REAL(dLabel1) | |
| | REAL_TO_DINT ^{*6,*7} | Converts single precision to 32-bit integer | × | ○ | × | ○ | D0:D:=REAL_TO_DINT(1.5) D0:D:=REAL_TO_DINT(W0:E) D0:D:=REAL_TO_DINT(eLabel1) | |
| Operator | := ^{*8,*9} | Assigns | × | ○ | ○ | ○ | Bit | X0:=TRUE |
| | | | | | | | Word | D0:=1 |
| | | | | | | | Device | D0:=D10 |
| | | | | | | | Label | D0:=wLabel1 |
| | + ^{*8} | Adds | × | ○ | × | ○ | D0:=D0+1 D0:=D0+D1 D0:=D1+wLabel1 D0:U:=1+D1:U | |
| | - ^{*8} | Subtracts | × | ○ | × | ○ | D0:=D0-1 D0:=D0-D1 D0:=D1-wLabel1 D0:U:=1-D1:U | |
| | > ^{*9,*10} | Compares | ○ | × | × | ○ | D0>0 | |
| | < ^{*9,*10} | | | | | | D0<0 | |
| | >= ^{*9,*10} | | | | | | D0>=0 | |
| | <= ^{*9,*10} | | | | | | D0<=0 | |
| | = ^{*9,*10,*11} | | | | | | D0=0 | |
| | <> ^{*9,*10,*11} | | | | | | D0<>0 | |
| | AND | | | | | | Combines conditions using 'AND' | ○ |
| OR | Combines conditions using 'OR' | ○ | × | × | × | Y0=TRUE OR Y1=FALSE | | |

| Category | String/Symbol | Description | Availability | | | | Usage example | |
|--------------------------------------|--------------------------|--|---------------|--------|--------|------|---|-----------|
| | | | Condi tion | Output | Device | | | |
| | | | | | Bit | Word | | |
| Device type specifier ^{*12} | :U | Uses a device as a 16-bit non-negative integer | ○ | ○ | × | ○ | Condition | D0:U=0 |
| | | | | | | | Output | D0:U:=0 |
| | :D | Uses a device as a 32-bit integer | ○ | ○ | × | ○ | Condition | D0:D=0 |
| | | | | | | | Output | D0:D:=0 |
| | :UD | Uses a device as a 32-bit non-negative integer | ○ | ○ | × | ○ | Condition | D0:UD=0 |
| | | | | | | | Output | D0:UD:=0 |
| | :E | Uses a device as FLOAT [Single Precision] | ○ | ○ | × | ○ | Condition | D0:E=0 |
| | | | | | | | Output | D0:E:=0 |
| | :ED | Uses a device as FLOAT [Double Precision] | ○ | ○ | × | ○ | Condition | D0:ED=0 |
| | | | | | | | Output | D0:ED:=0 |
| Symbol | .. ^{*1,*13,*14} | Specifies device range Example: X10..20 | × | ○ | ○ | × | X10..20:=TRUE X10..20:=X0 X10..20:=Label1 | |
| | (^{*15} | Open bracket | ○ | × | ○ | ○ | Y0=TRUE AND (Y1=TRUE OR Y2=FALSE) | |
| |) ^{*15} | Close bracket | ○ | × | ○ | ○ | | |
| Constant | TRUE ^{*16} | Turns ON a bit device | ○ | ○ | ○ | × | Condition | Y0=TRUE |
| | | | | | | | Output | X0:=TRUE |
| | FALSE | Turns OFF a bit device | ○ | ○ | ○ | × | Condition | Y0=FALSE |
| | | | | | | | Output | X0:=FALSE |

*1 Original description methods in the I/O system setting.

*2 An error occurs if the character is written at the top of a data record.

*3 When it is used without combining with "CONTINUE," an error does not occur but "LOOP" is ignored.
An error occurs if "LOOP" is written at the top of a data record.

*4 The timing that the execution transition of "INIT" is enabled are as follows:

- The I/O system setting was executed while the simulator is running
- The simulator was switched to RUN state while the I/O System Setting is executing

*5 Use both instructions according to the Structured Text notation.

📖 MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

*6 If the data type of devices or labels used for arguments or output destination does not match with the ones specified by an instruction, an error will occur.

*7 For operations when a specific value is specified for an instruction argument, refer to the following:

📖 Page 573 When an invalid value is specified for an instruction argument

*8 If devices or labels with different data type are set to the terms of substitution expression, addition expression, or subtraction expression, an error will occur.

*9 A device whose data type is not specified can be calculated with the Word [Signed] type constant or Word [Unsigned] type constant. In that case, the data type of the device is determined according to the data type of the constant.

*10 To compare devices or labels each other, data types need to be consistent.

*11 To compare bit type devices using a sign of equality or inequality, device and constant must be a set.

*12 For devices to which a device type specifier can be added, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

*13 A range for an assignment source cannot be specified.

*14 'A' to 'F' can be entered as device numbers for a device written in hexadecimal format. However, an error will occur if the order of the device numbers is changed in descending order. (Example: X10..2)

*15 There is no limit to the number of brackets if the combination of open brackets and close brackets matches.

*16 Only bit devices such as 'Y0' can be used for conditions. (When only 'Y0' is described, the 'Y0' will be 'TRUE'.)

■When an invalid value is specified for an instruction argument

If an invalid value is specified for an instruction argument, the value of the argument will be changed as follows.

| Instruction | Argument | Incorrect value | Changed value |
|--------------|--------------|----------------------|---------------|
| REAL_TO_INT | Device/label | -0 | 0 |
| | | Denormalized number | |
| | | NaN | |
| | | ±∞ | |
| | Constant | E32768 or more | 32767 |
| | Device/label | 32768 or more | -32768 |
| | Constant | E-32769 or less | |
| | Device/label | -32769 or less | |
| REAL_TO_DINT | Device/label | -0 | 0 |
| | | Denormalized number | |
| | | NaN | |
| | | ±∞ | |
| | Constant | E2147483648 or more | 2147483647 |
| | Device/label | 2147483648 or more | -2147483648 |
| | Constant | E-2147483649 or less | |
| | Device/label | -2147483649 or less | |

Precautions

A row starting with '/' is regarded as a comment, and therefore it is skipped.

Opening setting data

The following shows the procedure to open created setting data.

Operating procedure

1. Click the [...] button in the setting data column on the "I/O System Setting" screen.
2. Select a file, then click the [Open] button.

Precautions

Language-specific characters of the operating system are included in the setting data.

If the language font to display is not installed on the personal computer, some characters may be garbled.

Executing the I/O system

The following shows the procedure to run an I/O system after checking the setting data.

Operating procedure

Select [Execute] on the "I/O System Setting" screen.

If an error is included in the check result, correct the setting data and run the system again.

Precautions

If a function, device, or label which is not supported by the I/O system setting function of GX Works3 is included in the setting data, an error will occur.

Stopping the I/O system

The following shows the procedure to stop an I/O system.

Operating procedure

Select [Stop] on the "I/O System Setting" screen.

Available devices/labels

Device

The following devices are available.

| Category | Device name | Symbol |
|---------------------------------|---------------------------------|---------|
| User device | Input | X |
| | Output | Y |
| | Internal relay | M |
| | Latch relay | L |
| | Link relay | B |
| | Annunciator | F |
| | Link special relay | SB |
| | Timer | T |
| | | TS |
| | | TN |
| | | T |
| | Retentive timer | ST |
| | | STS |
| | | STN |
| | | ST |
| | Long timer | LT |
| | | LTS |
| | | LTN |
| | | LT |
| | Long Retentive Timer | LST |
| | | LSTS |
| | | LSTN |
| | | LST |
| | Counter | C |
| | | CS |
| | | CN |
| | | C |
| | Long counter | LC |
| | | LCS |
| | | LCN |
| | | LC |
| | Data register | D |
| | Link register | W |
| | Link special register | SW |
| System device | Special relay | SM |
| | Special register | SD |
| Link direct device | Link input | J□\X |
| | Link output | J□\Y |
| | Link relay | J□\B |
| | Link special relay | J□\SB |
| | Link register | J□\W |
| | Link special register | J□\SW |
| Module access device | Module access device | U□\G |
| CPU buffer memory access device | CPU buffer memory access device | U3E□\G |
| | | U3E□\HG |
| File register | File register | R |
| | | ZR |
| Refresh data register | Refresh data register | RD |
| Constant | Decimal constant | K |
| | Hexadecimal constant | H |
| | Real constant | E |

| Category | Device name | Symbol |
|---------------|-------------------------|--------|
| Safety device | Safety input | SAIX |
| | Safety output | SAIY |
| | Safety internal relay | SAIM |
| | Safety link relay | SAIB |
| | Safety special relay | SAISM |
| | Safety data register | SAID |
| | Safety link register | SAIW |
| | Safety special register | SAISD |
| | Safety timer | TS |
| | | TN |
| | | T |
| | Safety retentive timer | STS |
| | | STN |
| | | ST |
| | Safety counter | CS |
| | | CN |
| | | C |

Precautions

The following devices are not available:

- Local device
- Digit-specified bit device
- Bit-specified word device

In addition, a constant device cannot be used as the destination for a device value in an assignment statement.

Label

The following labels are available.

- Global label
- Module label
- Labels of which class is "VAR_GLOBAL"/"VAR_GLOBAL_RETAIN"
- Labels except for string (32)/string [Unicode] (32)/pointer type

Precautions

- A label to which a device unavailable for outputs or conditions for data record is assigned cannot be used when creating setting data. (📖 Page 575 Device)
- For the labels of timer/retentive timer/counter type, a contact/coil/current value need to be specified as same as devices.
- A device and label cannot be used as an array index.

12 SETTING ROUTE TO CPU MODULE

This chapter explains the setting method of connection destination for accessing a CPU module from a personal computer with GX Works3.

12.1 Specification of Connection Destination

This section explains the setting method of communication routes, including the interfaces both the personal computer and CPU module, and the routing networks, for accessing a CPU module in the "Specify Connection Destination" screen.

Up to 128 settings for connection destinations is created.

The same module type is required to be set for both a project and a CPU module to be accessed.

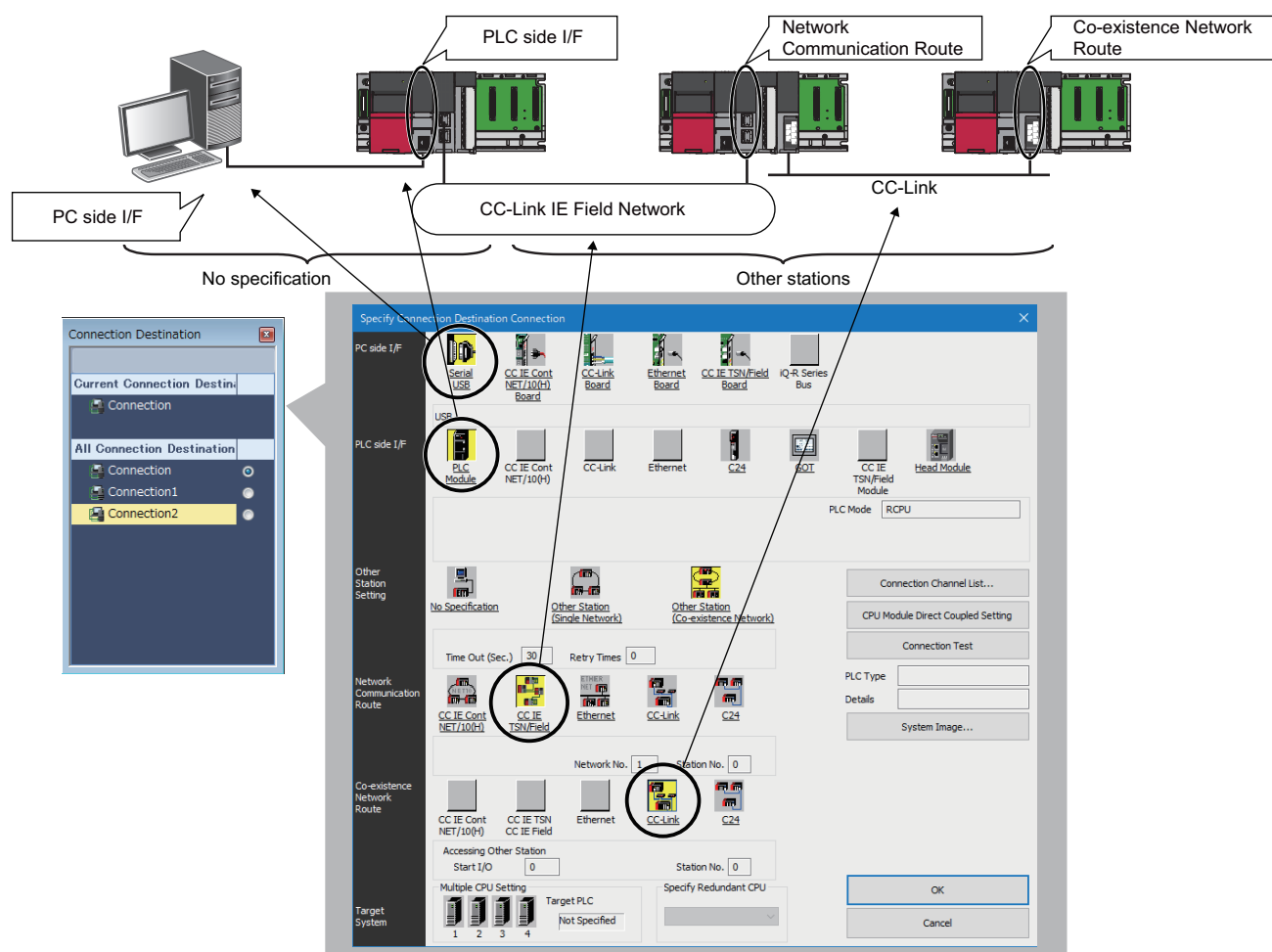
12

Changing connection destination settings

Window

Select data in the connection destination window and double-click it.

In another way, select [Online] ⇒ [Current Connection Destination] and change the current connection destination.



- Double-click the items underlined on the screen to set the details of each item.
- The icons colored yellow indicate that the settings have been applied.
- For FX5CPU, the icons of the unsettingable connection destination route are not displayed.
- When "Yes" is selected for the following option in a project for an FX5CPU, the "Connection Destination Simple Setting" screen appears before the "Specify Connection Destination" screen.
[Tool] ⇒ [Options] ⇒ "Online" ⇒ "Specify Connection Destination" ⇒ "Operational Setting" ⇒ "Show the Connection Destination Simple Setting window"

Displayed items

| Item | | Description |
|-----------------------------|---|--|
| Other Station Setting | No Specification | Specify this to access a CPU module directly connected to a personal computer. |
| | Other Station (Single Network) *1 | Specify this to access a CPU module on another station via only one kind of network (including a multi-tier system). Ethernet, CC-Link IE Controller Network, and CC-Link IE Field Network are regarded as the same kind. When accessing a system in which those are mixed, specify "Single Network." |
| | Other Station (Co-existence Network) *1 | Specify this to access the CPU module on another station via two kinds of network. |
| Network Communication Route | | Select the network type, network number, station number, and start I/O number of the network to be routed through to access another station. The setting items differ depending on the selected network type. |
| Co-existence Network Route | | Select the network type, network number, station number, and start I/O number of the network to be accessed. The setting items differ depending on the selected network type. |
| Target System | | <ul style="list-style-type: none">• Multiple CPU Setting: Specify an access destination in a multiple CPU system.• Specify Redundant CPU: Select a system of a CPU module to be connected. |

*1 To specify the own station, select "No Specification."

Precautions

- Only connection destinations that can be set in the "Specify Connection Destination" screen are acceptable.
- For the considerations when using a MELSECNET/H network module, refer to the following:

📖 MELSEC iQ-R Module Configuration Manual

Adding connection destination settings

Add a new setting of a connection destination.

Operating procedure

1. Right-click in the connection destination window and select [Create New Connection Destination] from the shortcut menu.
2. Set each item and click the [OK] button.

Switching connection destinations

Switch a connection destination used as the default.

Operating procedure

1. Select a connection destination under "All Connection Destination" in the connection destination window.
2. Right-click the connection destination and select [Set as Default Connection] from the shortcut menu.

Displaying an image of the set connection route

Click the [System Image] button to display the set connection route in an image and check the route.

Precautions

LHCPUs do not support this display.

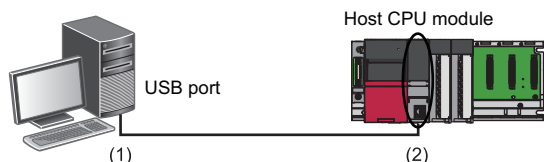
12.2 Direct Connection

This section explains the setting method for accessing the CPU module directly connected to a personal computer. Click the [CPU Module Direct Coupled Setting] button on the "Specify Connection Destination" screen to change the settings to direct connection.

USB connection

The following shows the setting example for accessing a CPU module on the own station with a USB from a personal computer.

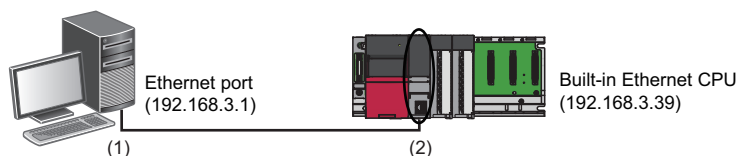
FX5UCPUUs and FX5UCCPUUs do not support this connection.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------|---------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | USB | — |
| (2) | PLC side I/F | PLC Module | PLC Mode | RCPU |
| | Other Station Setting | No Specification | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |

Ethernet connection

The following shows the setting example for accessing a built-in Ethernet CPU with Ethernet from a personal computer. Remote head modules do not support this connection.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------|---------------------|---------------------------------|---------------|
| (1) | PC side I/F | Ethernet Board | Adapter ^{*1} | Not Specified |
| | | | Network No. | — |
| | | | Station No. | — |
| | | | Protocol | UDP |
| (2) | PLC side I/F | PLC Module | Ethernet Port Direct Connection | — |
| | Other Station Setting | No Specification | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |

^{*1} No setting items for FX5CPUs

Specifying the Ethernet adapter on the personal computer side

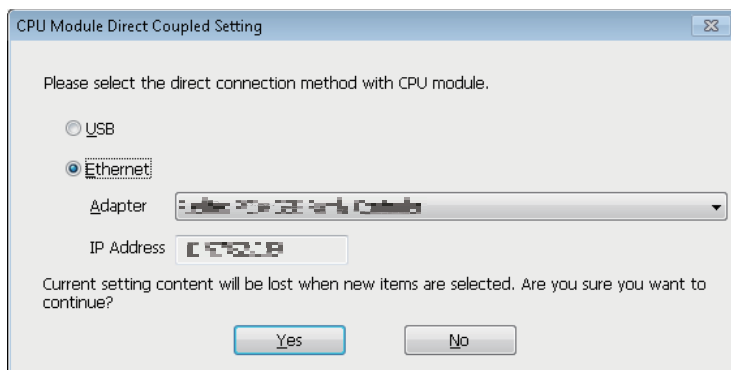
The Ethernet adapter on the personal computer side, which is used when directly connecting to an Ethernet port, can be specified.

If there are multiple Ethernet adapters, make sure that the Ethernet adapter that is used for communication is specified.

Operating procedure

1. Click the [CPU Module Direct Coupled Setting] button in the "Specify Connection Destination" screen.
2. Select an adapter in the "CPU Module Direct Coupled Setting" screen, and click the [Yes] button.

The following screen is a screen example for RCPUs.



Point

- For RCPUs and LHCPUs, the IP address assigned to a specified Ethernet adapter is saved in a project file. Even after changing adapters, if the IP address set for the adapter after the change is the same, the adapter name is applied to the settings.
- For FX5CPUs, the adapter setting is saved for each logon user of the personal computer (not saved in a project file).

Precautions

■When a warning message appears

A warning message may appear, which indicates that a function of GX Works3 is blocked by the Windows firewall.

Click the [Allow access] button, and continue the operation.

■When the same IP addresses are displayed

When the [Find] button is clicked in the "PLC side I/F Detailed Setting of PLC Module" screen, the same IP addresses may be displayed in the list of the connection destination CPU.

In that case, select an adapter in the "CPU Module Direct Coupled Setting" screen. (➡ Page 580 Specifying the Ethernet adapter on the personal computer side)

■When communication with GX Works3 is not allowed by the Windows firewall

When the Windows firewall is enabled and communication with GX Works3 is not allowed, a timeout may occur.

To allow the communication, refer to the following procedure.

When using other software with a firewall function, refer to the manual of the software and allow the communication with GX Works3.

Operating procedure

1. Select [System and Security] ⇒ [Allow an app through Windows Firewall] in the control panel of Windows.
2. Click the [Change settings] button, and click the [Allow another app] button.
3. Click the [Browse] button in the "Add an app" screen, and select "GXW3.exe" in the folder where GX Works3 is installed, then click the [Add] button.

When an installation folder is not changed at the installation, the installation folder is as follows:

- 64-bit version operating system: C:\Program Files (x86)\MELSOFT\GPPW3
- 32-bit version operating system: C:\Program Files\MELSOFT\GPPW3

4. Select "Domain," "Private," and "Public" of GX Works3^{*1} added in the list.

^{*1} 'gxw3' may be displayed when a CPU/Ethernet module is searched for on the network and access through the Windows firewall is set to allow before Ethernet port direct connection.

■When connecting GX Works3 to an RCP/LHCPU

The settings for the specified Ethernet adapter are not applied to other MELSOFT products.

When opening a project specifying an Ethernet adapter in another personal computer, the set content for "Adapter" in the "PC side I/F Detailed Setting of Ethernet Board" screen is changed to "Not Specified."

Set the connection destination again.

When an adapter name is not displayed on the pull-down list of "Adapter," the following causes can be considered:

- An Ethernet adapter has been disabled in "Change Adapter Settings" on Windows.
- A LAN cable is not connected.
- An error has occurred in the power supply.
- A failure or malfunction has been detected.

Take corrective actions such as checking the setting contents, Ethernet board connection, and the power supply status, or replacing the Ethernet board.

■When connecting GX Works3 to an FX5CPU

Communication may not be established even when the connection destination has been set in the screen displayed by clicking the [CPU Module Direct Coupled Setting] button.

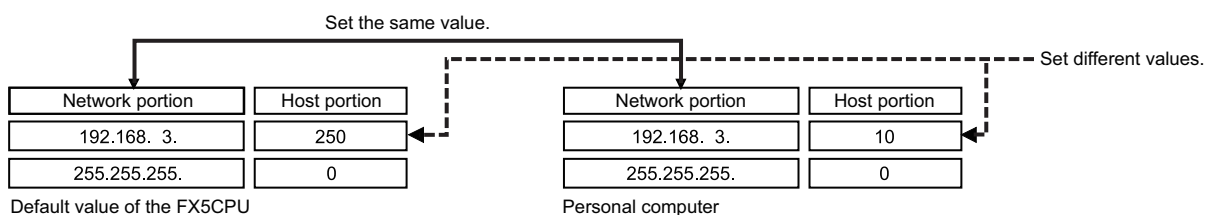
Set the IP address of a personal computer according to the following procedure.

Operating procedure

1. Select [Network and Internet] ⇒ [Network and Sharing Center] ⇒ [Change adapter settings] in the control panel of Windows.
2. Select and right-click [Local Area Connection], then select [Properties] from the shortcut menu.
3. Select "Internet Protocol Version 4 (TCP/IPv4)" in the "Local Area Connection Properties" screen, and click the [Properties] button.

The "Internet Protocol Version 4 (TCP/IPv4) Properties" screen appears.

4. Set the same value for the network portion of the IP addresses for a personal computer on which GX Works3 is installed and an FX5CPU.

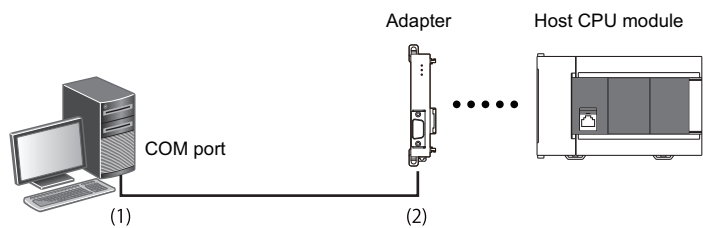


5. Restart the personal computer to enable the network setting.

Serial connection

The following shows the setting example for accessing a CPU module on the own station via a serial port of a personal computer.

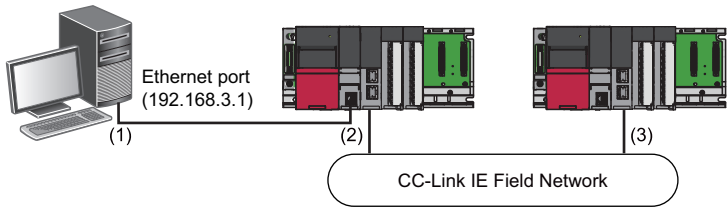
RCPUs, LHCPUs, and remote head modules do not support this connection.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------|---------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | RS-232C | — |
| | | | COM port | COM1 |
| | | | Transmission Speed | 115.2 Kbps |
| (2) | PLC side I/F | PLC Module | PLC Mode | FX5CPU |
| | Other Station Setting | No Specification | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |

12.3 Accessing via Network (Single Network)

This section shows the setting example for accessing a CPU module on another station via a single network after accessing a built-in Ethernet CPU from a personal computer.



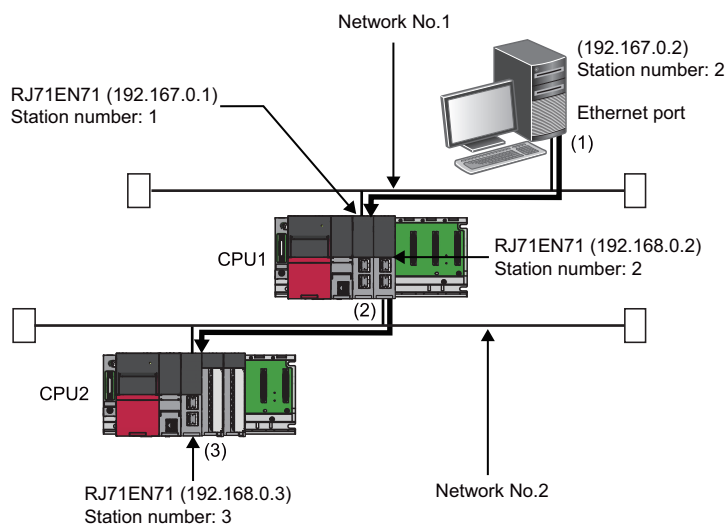
| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------------|--------------------------------|---------------------------------|---------------|
| (1) | PC side I/F | Ethernet Board | Adapter ^{*1} | Not Specified |
| | | | Network No. | — |
| | | | Station No. | — |
| | | | Protocol | UDP |
| (2) | PLC side I/F | PLC Module | Ethernet Port Direct Connection | — |
| | Other Station Setting | Other Station (Single Network) | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Network Communication Route | CC IE TSN | Network No. | 1 |
| | | CC IE Field | Station No. | 0 |

*1 No setting items for FX5CPUs

Access via Ethernet module

The following shows the setting example for accessing a CPU module via a CC-Link IE built-in Ethernet module from a personal computer.

It is the same settings when accessing a CPU module via the network part of RnENCPU.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------------|--------------------------------|---|---------------------------|
| (1) | PC side I/F | Ethernet Board | Adapter ^{*1} | Not Specified |
| | | | Network No. | 1 |
| | | | Station No. | 2 |
| | | | Protocol | TCP |
| (2) | PLC side I/F | Ethernet Module | PLC Type | RJ71EN71 |
| | | | Network No. | — |
| | | | Station No. | 1 |
| | | | IP Address | 192.167.0.1 |
| | | | IP Input Format | DEC |
| | | | Station No. <-> IP Information ^{*1} | Automatic Response System |
| | Other Station Setting | Other Station (Single Network) | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Network Communication Route | Ethernet | Other station in the same loop or access to multilevel system ^{*1} | Network No. 2 |
| | | | | Station No. 3 |

^{*1} No setting items for FX5CPUs

Precautions

- To communicate with multiple personal computers where GX Works3 is running by connecting them to a single CPU module, use TCP/IP or UDP/IP communication.
- For a multiple network system, setting the network dynamic routing is required. (RCPUs only)

📖 MELSEC iQ-R Ethernet User's Manual (Application)

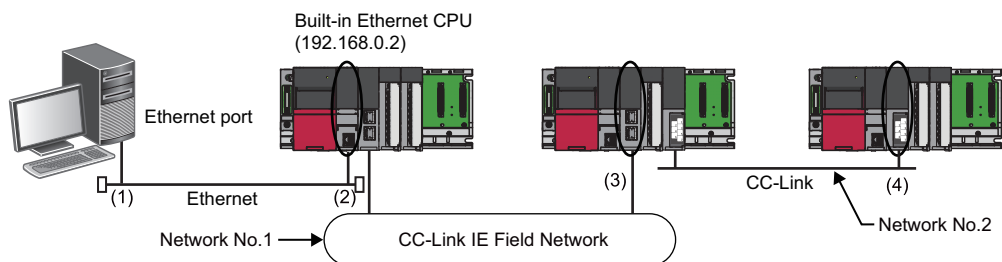
■ When the same IP addresses are displayed

When the [Find] button is clicked in the "PLC side I/F Detailed Setting of Ethernet Module" screen, the same IP addresses may be displayed in the list of the connection destination Ethernet modules.

In that case, select an adapter in the "PC side I/F Detailed Setting of Ethernet Board" screen.

12.4 Accessing via Network (Co-existence Network)

The following shows the setting example for accessing a CPU module via a co-existence network from a personal computer. LHCPUs and FX5CPUs do not support this access.



| No. | Item | Item to be selected | Internal setting | | Input value | |
|-----|-----------------------------|--------------------------------------|-----------------------------|--------------------|---------------|-----|
| (1) | PC side I/F | Ethernet Board | Adapter | | Not Specified | |
| | | | Network No. | | | 1 |
| | | | Station No. | | | 1 |
| | | | Protocol | | | TCP |
| (2) | PLC side I/F | PLC Module | Connection via HUB | IP Address | 192.168.0.2 | |
| | | | | Response Wait Time | 2 seconds | |
| | Other Station Setting | Other Station (Co-existence Network) | Check at Communication Time | | 30 seconds | |
| | | | Retry Times | | 0 time | |
| (3) | Network Communication Route | CC IE TSN CC IE Field | Network No. | | 1 | |
| | | | Station No. | | 0 | |
| (4) | Co-existence Network Route | CC-Link | Start I/O | | 20 | |
| | | | Station No. | | 1 | |

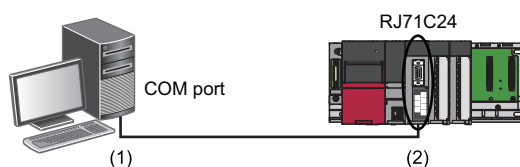
12.5 Accessing via Serial Communication Module

This section explains the setting method for accessing a CPU module on the own station or on another station via a serial communication module.

LHCPUs and FX5CPUs do not support this access.

Connection on a 1:1 basis

The following shows the setting example for accessing a CPU module by connecting a personal computer and a serial communication module.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------|---------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | COM port | COM1 |
| | | | Transmission Speed | 115.2 Kbps |
| (2) | PLC side I/F | C24 | PLC Type | RJ71C24 |
| | | | Station No.*1 | — |
| | | | Parity | — |
| | | | Sum Check | — |
| | | | Check at Communication Time | — |
| | Other Station Setting | No Specification | Retry Times | — |

*1 Set the same station number as RJ71C24.
Set the station number on the Module Parameter screen.

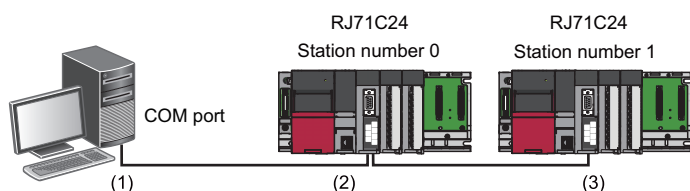
Connection on a 1:n basis

The following explains the method for accessing a CPU module on another station from a personal computer in a system composed of multiple CPU modules.

Access via a serial communication module

The following shows the setting example for accessing a CPU module on another station via a serial communication module. When connecting via serial communication module, the module parameter for MELSOFT connection is required. For details, refer to the following:

📖 MELSEC iQ-R Serial Communication Module User's Manual(Application)



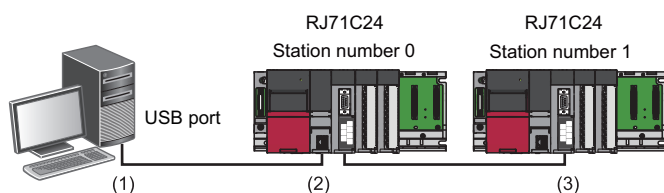
| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------------|--------------------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | COM port | COM1 |
| | | | Transmission Speed | 115.2 Kbps |
| (2) | PLC side I/F | C24 | PLC Type | RJ71C24 |
| | | | Station No. | 0 |
| | | | Parity | Odd |
| | | | Sum Check | — |
| | Other Station Setting | Other Station (Single Network) | Check at Communication Time | 30 seconds |
| (3) | Network Communication Route | C24 | Retry Times | 0 time |
| | | | Start I/O | 20 |
| | | | Station No. | 1 |

Direct connection of a CPU module

The following shows the setting example for accessing a CPU module on another station via a serial communication module by connecting a personal computer and a CPU module directly.

A programmable controller CPU on another station can be accessed only with CH2 of a serial communication module.

Access to an LHCPU is not available.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------------|--------------------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | USB | — |
| (2) | PLC side I/F | PLC Module | PLC Mode | RCPU |
| | Other Station Setting | Other Station (Single Network) | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Network Communication Route | C24 | Start I/O | 20 |
| | | | Station No. | 1 |

12.6 Accessing via GOT (GOT Transparent Function)

This section explains the setting method for accessing a CPU module from a personal computer using the GOT transparent function.

Precautions

■When performing online operations from a personal computer

During the online operation from a personal computer to a CPU module using the GOT transparent function, do not perform online operations (such as downloading project data) on GOT from GT Designer2 or GT Designer3.

■When GOT does not monitor normally

The GOT transparent function cannot be used in the following cases.

- When a GOT does not perform normal monitoring due to CPU module errors or communication errors between the CPU module and the GOT
- During the period of time between turning ON or resetting the CPU module or GOT and the start of GOT monitoring

Check the following items if monitoring on GOT is not normal.

| Item | Reference |
|--|-----------------------------|
| Does the CPU module operates normally? | Page 733 Module Diagnostics |
| Is the CPU module connected to GOT normally? | Manual of GOT used |

Access via a GOT

A personal computer (GX Works3) can access a CPU module via a GOT.



The connection availability and the specification method of connection destination differ depending on a GOT series and the connection condition between a personal computer and a GOT.

For details, refer to the following:

📖 GOT2000 Series Connection Manual (Mitsubishi Products) For GT Works3 Version1

📖 GOT1000 Series Connection Manual (Mitsubishi Products) for GT Works3

Accessing via a GOT and a module

A personal computer can access a CPU module via a GOT and another module (serial communication module, CC-Link IE Controller Network module, CC-Link IE Field Network module, Ethernet module, and CC-Link IE TSN module).



The connection availability and the specification method of connection destination differ depending on a GOT series and the connection condition between a personal computer and a GOT.

For details, refer to the following:

📖 GOT2000 Series Connection Manual (Mitsubishi Products) For GT Works3 Version1

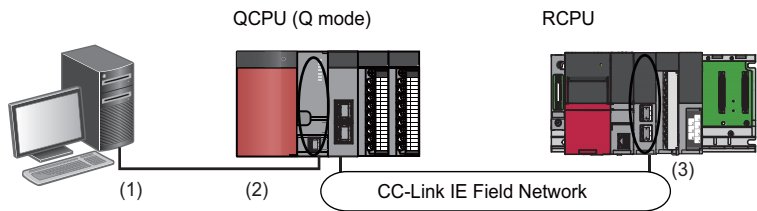
📖 GOT1000 Series Connection Manual (Mitsubishi Products) for GT Works3

12.7 Accessing via QCPU (Q mode)

This section explains the setting method for accessing a CPU module from a personal computer via a QCPU (Q mode). Neither an LHCPU nor an FX5CPU can be accessed via a QCPU (Q mode). The QCPU (Q mode) that can be used as a PLC side I/F are as follows.

| Item | Available QCPU (Q mode) |
|---|---|
| PC side I/F: Serial communication (USB) | Built-in USB port QCPU (Q mode) Note that remote I/O modules (QJ72LP25 and QJ72BR15) are excluded. |
| PC side I/F: Ethernet board | Built-in Ethernet CPU |

The following shows the setting example for accessing an RCPU via a QCPU (Q mode) from a personal computer.



| No. | Item | Item to be selected | Internal setting | Setting content |
|-----|-----------------------------|--------------------------------|-----------------------------|-----------------|
| (1) | PC side I/F | Serial/USB | USB | — |
| (2) | PLC side I/F | PLC Module | PLC Mode | QCPU (Q mode) |
| | Other Station Setting | Other Station (Single Network) | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Network Communication Route | CC IE TSN CC IE Field | Network No. | 1 |
| | | | Station No. | 0 |

Precautions

- An RCPU cannot be accessed via a MELSECNET/10 network module or a MELSEC-Q series MELSECNET/H network module.
- A remote password that has been set for the Ethernet port of a QCPU (Q mode) cannot be unlocked in GX Works3. Delete the remote password using GX Works2 in advance.

12.8 Accessing via QJ71E71-100

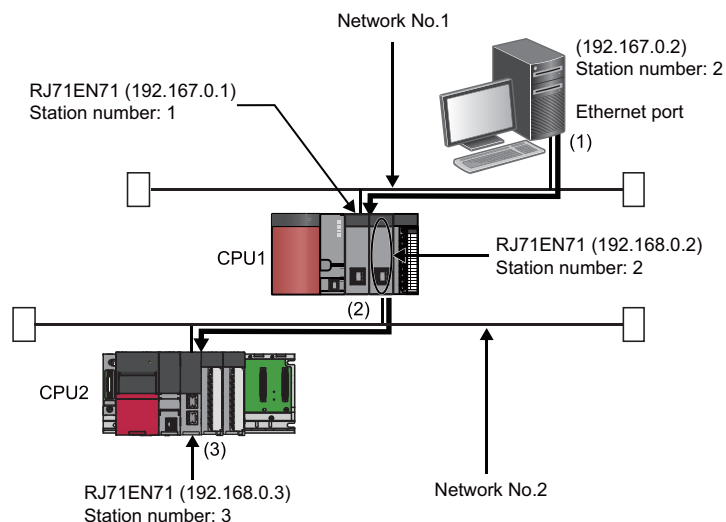
This section explains the setting method for accessing a CPU module from a personal computer via QJ71E71-100.

Neither an LHCPU nor an FX5CPU cannot be accessed via QJ71E71-100.

The QCPUs (Q mode) that can be used as a PLC side I/F are as follows.

- Universal model QCPU
- Universal model process CPU
- High-speed universal model QCPU

The following shows the setting example for accessing an RCPU via QJ71E71-100 from a personal computer.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------------|--------------------------------|---|---------------------------|
| (1) | PC side I/F | Ethernet Board | Adapter | Not Specified |
| | | | Network No. | 1 |
| | | | Station No. | 2 |
| | | | Protocol | TCP |
| (2) | PLC side I/F | Ethernet Module | PLC Mode | QCPU (Q mode) |
| | | | PLC Type | QJ71E71-100 |
| | | | Network No. | — |
| | | | Station No. | 1 |
| | | | IP Address | 192.167.0.1 |
| | | | IP Input Format | DEC |
| | | | Station No. <-> IP Information | Automatic Response System |
| | | | Check at Communication Time | 30 seconds |
| | Other Station Setting | Other Station (Single Network) | Retry Times | 0 time |
| | | | | |
| (3) | Network Communication Route | Ethernet | Other station in the same loop or access to multilevel system | Network No. 2 |
| | | | | Station No. 3 |
| | | | | |

Precautions

- An RCPU cannot be accessed via a MELSECNET/10 network module or a MELSEC-Q series MELSECNET/H network module.
- A remote password that has been set for the Ethernet port of QJ71E71-100 cannot be unlocked in GX Works3. Delete the remote password using GX Works2 in advance.
- To communicate with multiple personal computers where GX Works3 is running by connecting them to a single CPU module, use TCP/IP or UDP/IP communication.
- For a multiple network system, setting the network dynamic routing is required.

📖 MELSEC iQ-R Ethernet User's Manual (Application)

📖 MELSEC-Q/L Ethernet Interface Module User's Manual (Application)


12.9 Connection to the Multiple CPU System

This section explains the setting method for accessing the CPU module (host CPU) directly connected to the personal computer or another CPU module (another CPU) in the multiple CPU system.

The setting method for accessing the multiple CPU system on another station via a network is also explained.

LHCPUs, FX5CPUs, and remote head modules do not support this connection.

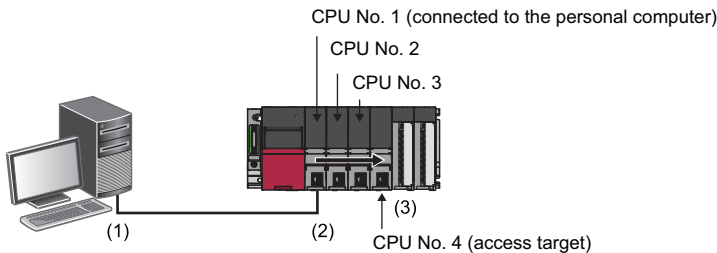
Accessing host CPU

The setting for accessing the host CPU is the same as that for accessing the CPU module on the own station. ( Page 579 Direct Connection)

Accessing another CPU

To access a CPU module, which is not directly connected to a personal computer, in the multiple CPU system, the CPU number (CPU No.1 to 4) of the access target needs to be specified in "Multiple CPU Setting."

The following shows the setting example for accessing a CPU No.4 by connecting a personal computer to CPU No.1.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|---------------|----------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | USB | — |
| (2) | PLC side I/F | PLC Module | PLC Mode | RCPU |
| | | | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Target System | Multiple CPU Setting | Target PLC | PLC No. 4 |

Accessing via network

The following explains the setting methods for accessing a CPU module in a multiple CPU system on another station via a network.

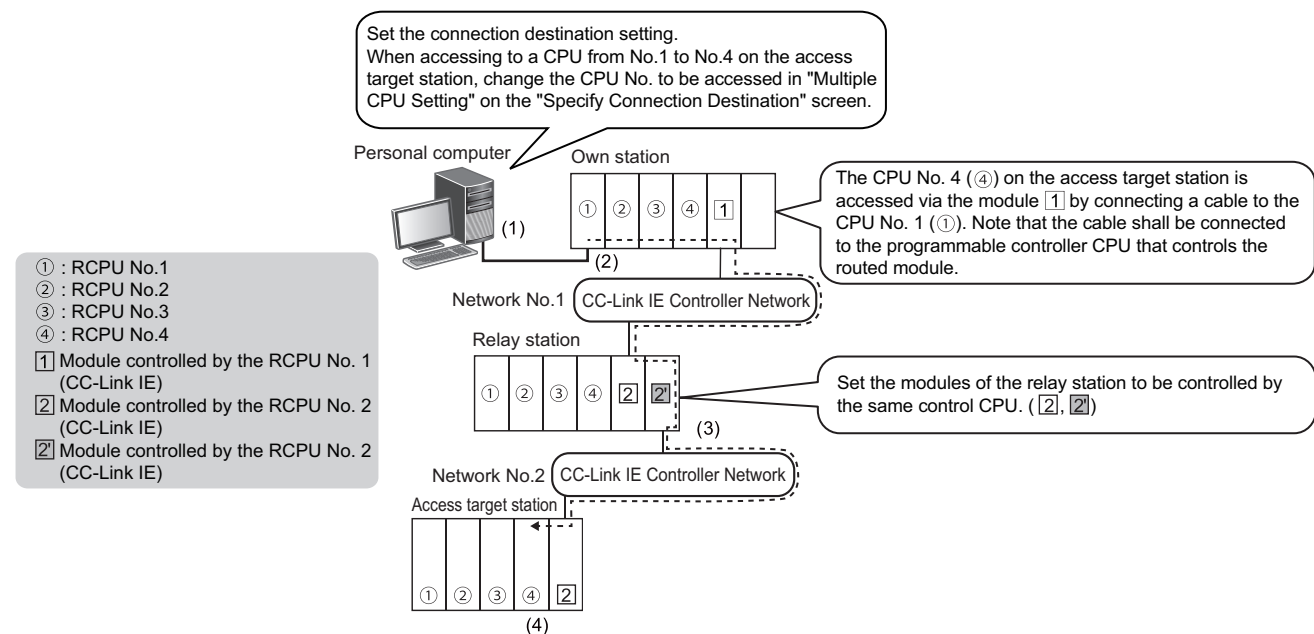
Relay station

Set the parameters so that the module mounted on the relay station is controlled by the same CPU module. (In the figure below, the CPU No.2 is the control CPU.)

Access target station

Set the CPU number in "Multiple CPU Setting" on the "Specify Connection Destination" screen when the access target station is the multiple CPU system.

The following shows the setting example for accessing a CPU No.4 in a multiple CPU system on the access target station via a network.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------------|--------------------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | USB | — |
| (2) | PLC side I/F | PLC Module | PLC Mode | RCPU |
| | Other Station Setting | Other Station (Single Network) | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Network Communication Route | CC IE Cont NET/10(H) | Network No. | 2 |
| | | | Station No. | 0 |
| (4) | Target System | Multiple CPU Setting | Target PLC | PLC No. 4 |

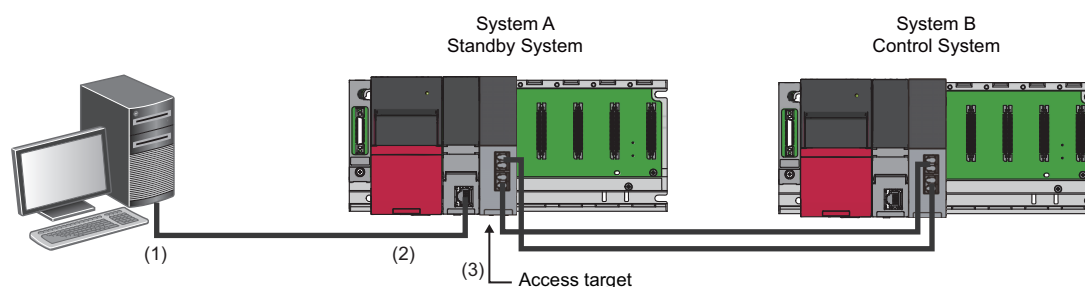
12.10 Connection to the Redundant System

This section explains the setting method for accessing a CPU module by specifying a system in the redundant system. Only RnPCPUs (redundant mode), RnPSFCPUs, and remote head modules support this connection.

CPU module redundant system

To access a CPU module in a redundant system configuration, the system of access target (no specification/control system/standby system/system A/system B) needs to be specified in "Specify Redundant CPU."

The following shows the setting example for accessing a standby system via the system A of an RnPCPU (redundant mode) that is connected to a personal computer.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------|-----------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | USB | — |
| (2) | PLC side I/F | PLC Module | PLC Mode | RCPU |
| | Other Station Setting | No Specification | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Target System | Specify Redundant CPU | Standby System | — |

When "Not specified" is selected in "Specify Redundant CPU," the access target is set as follows:

- Direct connection: connective system
- Connection via a module mounted on a main base unit: CPU module on the station on which the network module, with the station number specified for the network communication route, is mounted
- Connection via a module mounted on an extension base unit: CPU module in the control system

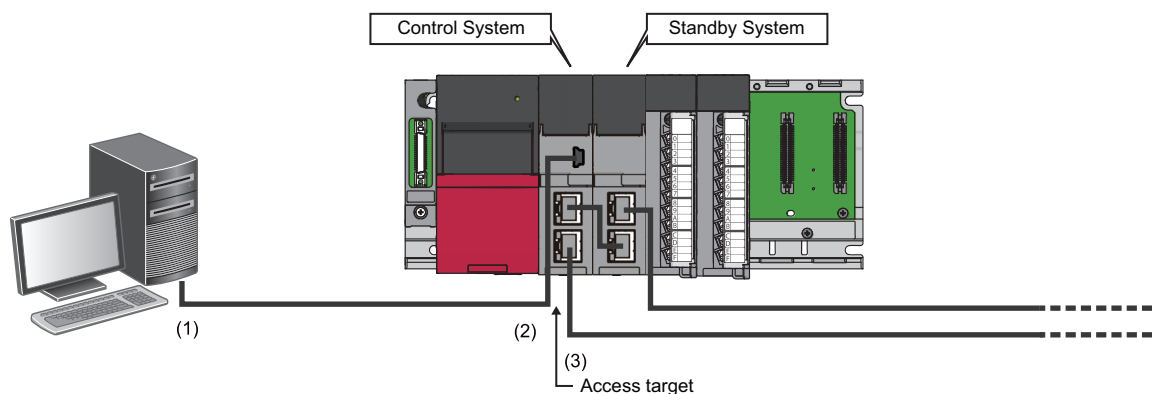
For the considerations for accessing a CPU module via a module on a redundant extension base unit, refer to the following:

📖 MELSEC iQ-R Module Configuration Manual

Remote head module redundant system

To access a remote head module in a redundant system configuration, the access target (CPU No.1/CPU No.2/no specification/control system/standby system) needs to be specified in "Multiple CPU Setting" or "Specify Redundant CPU." The setting for either "Multiple CPU Setting" or "Specify Redundant CPU" can be set.

The following shows the setting example for accessing a remote head module (single line) from a personal computer using a USB connection.



| No. | Item | Item to be selected | Internal setting | Input value |
|-----|-----------------------|-----------------------|-----------------------------|-------------|
| (1) | PC side I/F | Serial/USB | USB | — |
| (2) | PLC side I/F | Head module | RJ72GF15-T2 | — |
| | Other Station Setting | No Specification | Check at Communication Time | 30 seconds |
| | | | Retry Times | 0 time |
| (3) | Target System | Specify Redundant CPU | Control System | — |

When "Not specified" is selected in "Specify Redundant CPU," the access target is set as follows:

- Direct connection: remote head module that is directly connected to a personal computer
- Connection via a module mounted on a main base unit: remote head module No.1 (mounted on a CPU slot) on the station on which the network module, with the station number specified for the network communication route, is mounted
- Connection via a module mounted on an extension base unit: remote head module No.1 (mounted on a CPU slot)

12.11 Considerations of Communication with a CPU module

This section explains the considerations of communication with a CPU module.

Refer to the considerations described in each section as well as the descriptions in this section.

Communication via network system (single/multiple)

When accessing an RCPU via a network system, all the connected stations must be RCPUs or QCPUs (Q mode).

In that case, an RCPU must be used for a relay station.

Connected station: Station directly connected from a personal computer

Relay station: Stations to be routed on network system

Communication with the CPU module using a USB cable

■Connecting/disconnecting a USB cable, resetting a CPU module, and turning the power ON or OFF

A communication error may occur and it may not be recovered if connecting and disconnecting a USB cable, resetting the CPU module, or turning the power ON or OFF is performed frequently during communication with a CPU module.

Therefore, set GX Works3 to offline as much as possible during these operations. 'Offline' indicates the state other than below.

- Write to PLC/Read from PLC, Monitor, and PLC diagnostics

If the operation is not recovered from an error, remove the USB cable. Then, connect it again after five or more seconds.

(Even after this operation, an error may occur at initial communication. However, communication will be successful after that.)

Click the [OK] button on the warning message, and remove a USB cable from the personal computer.

■Combination of personal computer models and USB cables

A communication error may occur depending on the combination of personal computer models and USB cables.

If an error occurs, take appropriate actions in accordance with the message displayed on the screen.

Other considerations

■High-speed communication using an RS-232 cable

Communication may fail depending on the performance of the personal computer when high-speed communication is attempted by changing the transmission speed at the serial port of the personal computer (personal computer side interface).

Communication speed may also slow down due to communication retries.

Decrease the transmission speed if high-speed communication cannot be performed normally.

■Resume function, suspend setting, power saving function, and standby mode of the personal computer

A communication error may occur during communication with the CPU module when any of the settings shown above is enabled.

Disable these settings for communication with the CPU module.

13 WRITING/READING DATA TO CPU MODULE

This chapter explains the following operations: writing, reading, and deleting data to/from a CPU module or an SD memory card, and verifying projects.

For the methods for writing the clock setting to a CPU module, refer to the following:

☞ Page 788 Clock Setting in a CPU Module

13.1 Writing/Reading Programmable Controller Data

Read/write the created data to/from a CPU module or an SD memory card in the "Online Data Operation" screen.

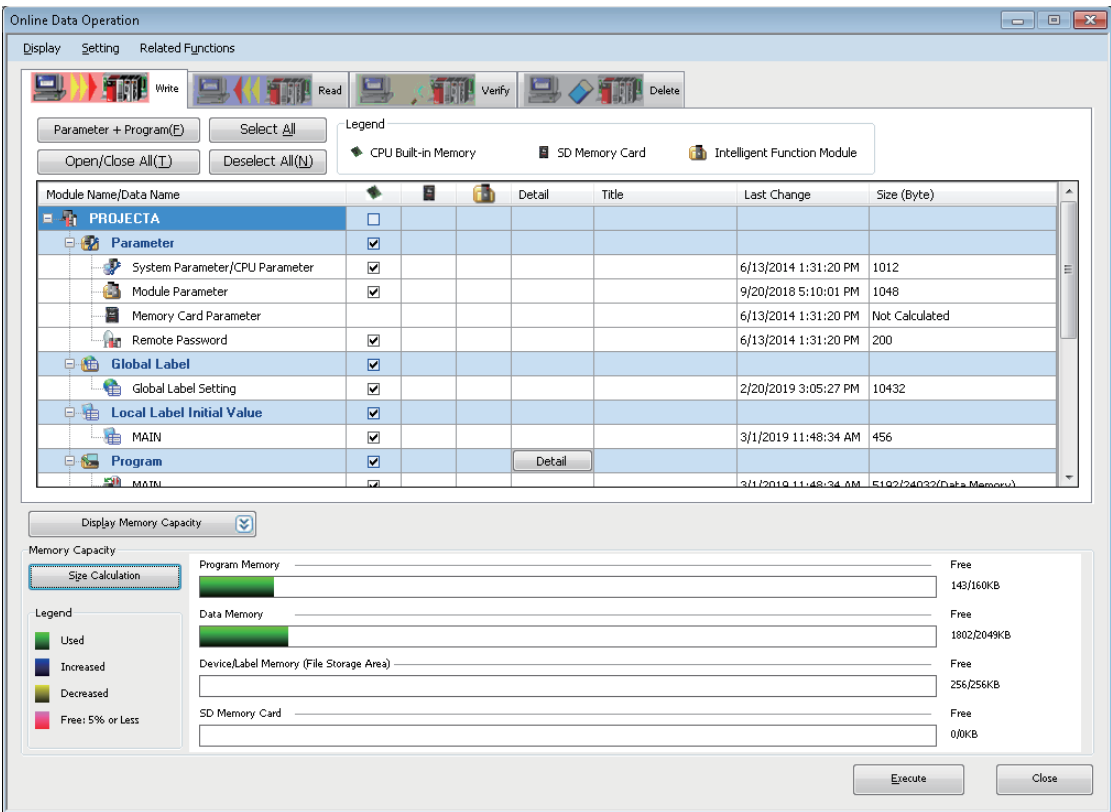
Configuration of the online data operation screen

Window

Select [Online] ⇒ [Write to PLC] ()/[Read from PLC] ()/[Delete PLC Data].

Ex.

The following screen is an example when writing data to an R01CPU.



- The data name in gray indicates that it is in the unconverted state.
- When a data is written to a programmable controller, the target memory capacity may be displayed smaller than the actual file size.
- Graphs for each memory capacity can be updated by clicking the [Size Calculation] button.
- The following menus are available in the "Online Data Operation" screen:

| Menu | Description | Reference |
|--|---|--|
| [Display] ⇒ [Display File Size] | To display the size of data to be written in the "Size (Byte)" column and in graphs for memory capacity. | Page 598 How to check the data size to be written Page 598 Graph display of memory capacity |
| [Setting] ⇒ [Set Favorites] | To set data to be displayed in the "Online Data Operation" screen. In addition, data to be selected by clicking the [Select Favorites] button can be set. | Page 598 Set favorites screen |
| [Related Functions] ⇒ [CPU Memory Operation] | To initialize a memory or clear it to zero. | Page 801 Initializing/Clearing a Memory |
| [Related Functions] ⇒ [Remote Operation] | To change execution statuses of a CPU module and remote head module. | Page 789 Remote Operation |
| [Related Functions] ⇒ [Redundant Operation] | To operate the redundant function of a CPU module and remote head module in a redundant system configuration. | Page 791 Redundant Programmable Controller Operations |
| [Related Functions] ⇒ [Set Clock] | To set the clock on a CPU module. | Page 788 Clock Setting in a CPU Module |

■How to check the data size to be written

The file size display can be enabled by selecting the following menu in the "Online Data Operation" screen:

- [Display] ⇒ [Display File Size]

The size of write data can be displayed in the "Size (Byte)" column by enabling the file size display.

For program files, FB files, and FUN files, the size of program restoration information can be checked.

Display example: Size of an execution program/size of program restoration information (data memory)

■Graph display of memory capacity

The display content differs depending on the setting file size display.

Disabled: The current capacity of memory for writing on target is displayed.

Enabled: The capacity of memory to which the size of data to be written/deleted is displayed.

■Set favorites screen

The "Set Favorites" screen appears by selecting the following menu in the "Online Data Operation" screen:

- [Setting] ⇒ [Set Favorites]

Only data for which the checkbox in the "Show" column is selected is displayed in the "Online Data Operation" screen.

The [Parameter + Program] button in the "Online Data Operation" screen is switched to the [Select Favorites] button if the checkbox in the "Select Favorites Button" column of optional data is selected.

By clicking the [Select Favorites] button, data that is frequently used such as the system parameters, CPU parameters, and programs can easily be selected.

■Data to be written and writing destinations

The following table shows writing destinations and whether each data can be written to the destinations.

○: Writable, ×: Not writable

| Data name | | Writing destination | | |
|--|---|---------------------|------------------------------|-----------------------------|
| | | CPU built-in memory | SD memory card ^{*1} | Intelligent function module |
| System parameter/CPU parameter | | ○ | ○ | × |
| Module parameter | | ○ | ○ | × |
| Module extended parameter | | ○ ^{*2} | ○ ^{*2} | ○ ^{*3} |
| Memory card parameter ^{*1} | | × | ○ | × |
| Remote password | | ○ | ○ | × |
| Device station setting ^{*4,*5} | | ○ | ○ | × |
| Recording setting ^{*6} | | ○ | ○ | × |
| Global label | Global label setting | ○ | ○ | × |
| | Global label assignment information ^{*7} | ○ | ○ | × |
| Program file ^{*5} | | ○ | ○ | × |
| FB file/FUN file ^{*5} | | ○ | ○ | × |
| Initial label value file ^{*7} | Global label initial value file | ○ | ○ | × |
| | Local label initial value file | ○ | ○ | × |
| Device memory (file register ^{*7}) | | ○ | × | × |
| Extended file register ^{*8} | | × | ○ | × |
| Initial device value ^{*5} | | ○ | ○ | × |
| Device comment ^{*9} | | ○ | ○ | × |

*1 R00CPU and remote head modules do not support it.

*2 For LHCPUs, data is written to the flash ROM in the module.

*3 Module extended parameters of a camera recorder module cannot be written to the intelligent function module.

*4 RnCPUs, RnENCPU, RnSF CPUs, FX5UCPU, and FX5UCCPU support it.

*5 Remote head modules do not support it.

*6 RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU), RnENCPU, and RnSF CPU support it.

*7 FX5CPUs do not support it.

*8 Only FX5CPUs support it.

*9 FX5CPUs and remote head modules support common device comments only; therefore, each program device comments are not supported.

For the details on the availability of writing safety data, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

Precautions

■Safety project and safety operation mode of a CPU module


The safety data and device memory of a safety project can only be written when the safety operation mode of an RnPSFCPU or an RnSF CPU is in the test mode. If the module is in the safety mode, switch the mode to the test mode.

📖 Page 794 Safety operation mode switching

Writing data to a programmable controller

Write data to a CPU module.

For the considerations for writing, refer to the following:

 Page 613 Considerations for Online data operation

Operating procedure

1. Select the [Write] tab on the "Online Data Operation" screen.
2. Select data to be written and a write destination.
3. Click the [Detail] button to set the details such as a range to be written.
4. Click the [Execute] button.

After writing a safety program or a parameter to an RnPSFCPU or an RnSFCPU, manuals are displayed to clarify the information that needs to be confirmed by users for using a safety project safely.

Point

When more than one program is written to the CPU module, the programs categorized as "No Execution Type" will never be executed on the CPU module. For saving the memory capacity of the CPU module, removing them from the target data at writing data is recommended.

■Program restoration information

Whether to write program restoration information can be selected when performing 'Write to PLC.'

Program restoration information is used for restoring a GX Works3 project read from a programmable controller. This information includes the rendering information of programs and the definition information of local labels.

By setting the following option, whether or not to write the program restoration information can be selected in the "Online Data Operation" screen.

- [Tool] ⇒ [Options] ⇒ "Online" ⇒ "Program Restore Information" ⇒ "Operational Setting" ⇒ "Enable the setting to write/not to write program restore information"

Only the program restoration information can be written to a CPU module by selecting "Write a Program Restore Information (Target Data to Write: Program Restore Information)" for "Program Restore Information" in the "Online Data Operation" screen.

When writing a safety program, safety FB, and safety FUN, the program restoration information is written to an RnSFCPU even if "Do not Write a Program Restore Information (Target Data to Write: Program)" has been selected for "Program Restore Information."

When a program is written without writing the program restoration information, the data cannot be read with 'Read from PLC,' and the detailed verification result screen cannot be displayed with 'Verify with PLC.'

For CPU modules that do not support this function, whether to write the program restoration information cannot be selected even when the option is set.

■Skip overwriting data

When writing data to a CPU module, writing data that is not changed from the previous writing can be skipped, and that can shorten the time required for writing.

Operating procedure

1. Click the [Execute] button in the "Online Data Operation" screen.
2. Check the message and select the checkbox of "Skip writing for the files that have not been changed."

Precautions

The following table shows the data that is overwritten every writing.

- Device memory
- File register

If the following specific conditions are satisfied, the following data will be overwritten regardless of whether the checkbox of "Skip writing for the files that have not been changed." is selected.

| Data | Condition |
|-------------------------------------|---|
| Program file | The program restoration information is written to a CPU module where it is not written yet. |
| FB file (including SlibFbFile) | |
| FUN file | |
| Global label assignment information | Writing the global label setting is not skipped. |
| Initial global label value | |
| Initial local label value | Writing program files is not skipped. |

In any the following cases, data is overwritten even if no changes are applied.

- The program restoration information of an RnPCPU (redundant mode) exists only in the control system or standby mode.
- An intelligent function module is selected as the writing destination.

■POU duplication check

When performing 'Write to PLC,' the program is checked whether a POU name is duplicated in the program and in a program in the CPU module.

When using a CPU module in a redundant system configuration and writing a program to both systems, the program is checked whether a POU name is duplicated in the both systems.

Whether to check the duplication can be set by setting the following option.

- [Tool] ⇒ [Options] ⇒ "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Duplication Check for POU"

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.


An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|--|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). If an error occurs in the control system while writing data, it is not written to the standby system. If an error occurs in the standby system while writing data, the data of control system cannot be restored to its former condition. |

Point

Data allocations are changed by updating a firmware version from 30 or earlier to 31 or later for the R04CPU, R08CPU, R16CPU, R32CPU, or R120CPU.

For details on the operation, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

This may cause a lack of free space in the program memory when data backed up is written to the CPU module. In this case, perform any of the following operations and write the data again.

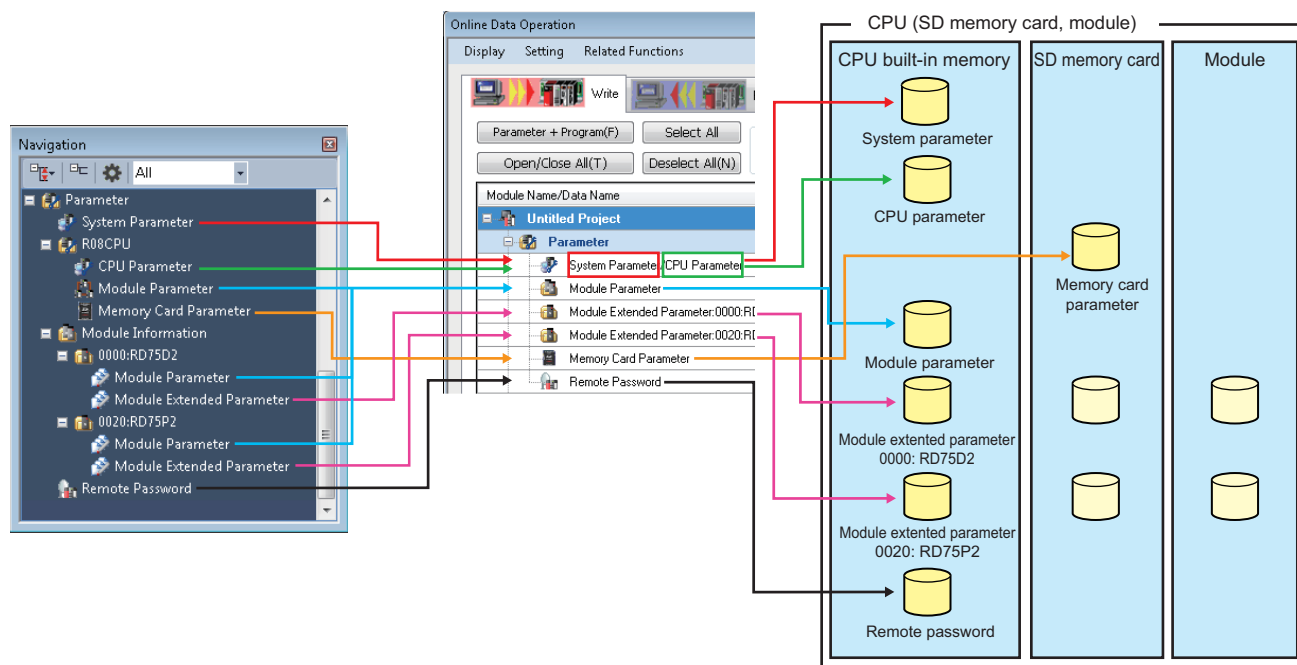
- Reduce the setting value of "Allocate Memory for Online Program Change." (Default: 500 steps)
- Reduce the number of program steps.

Parameter

Write parameters according to the operations and changes of the system.

■Relation between module parameters in the navigation window and module parameters in a CPU module

Module parameters are written to a CPU module as the data which integrates the parameters displayed in the navigation window into one file.



13

When a module parameter exists in a CPU module, the parameter file is overwritten.

Ex.

When writing four module parameters to a CPU module in which module parameters of five modules exist; the settings of five modules are overwritten with the settings of four modules, and one setting that does not exist in the project will be deleted.

■Consistency of parameters

When writing a part of the parameters additionally or writing modified parameters, the consistency of the parameters are required. Consistency means matching the information such as the I/O assignment setting (start I/O number, slot number, etc.) between the system parameters and each parameter.

There are two methods to keep the consistency.

- Read a system parameter and each parameter and change them. After that, write them to a CPU module. The CPU module needs to be reset to change the system parameter.
- Read each parameter to be changed, and change them to be consistent with the system parameters in the project. After that, write the changed parameters only to the CPU module. Basically, the CPU module does not need to be reset, however, some modules are required to reset the CPU module after changing parameters. For details, refer to the manual of the module used.

■Modules with start I/O number unset

The unset module parameters cannot be written to a programmable controller.

■Parameters of a remote I/O module (device station) on CC-Link IE Field Network

Parameters can be written to a device station in the "CC IE Field Configuration" window. For details, refer to the manual of each remote I/O module.

■Parameters of a remote I/O module (device station) on CC-Link IE TSN

When writing parameters of a device station to a CPU module, the parameters can be set to the device station by the following operations.

Operating procedure

1. Select the checkbox in the "Parameter Automatic Setting" column for a device station and configure items in "<Detail Setting>" in the "CC-Link IE TSN Configuration" window.
2. Select the checkbox of "Device Station Setting"/"Device Station Setting (Safety)" under "CC-Link IE TSN Configuration" in the "Online Data Operation" screen.
3. Click the [Detail] button.
4. Select a device station to be written the parameters to in the "CC-Link IE TSN Configuration - Device Station Setting" screen.

For details on "Parameter Automatic Setting," refer to the following:

📖 MELSEC iQ-R CC-Link IE TSN User's Manual (Application)

📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual

📖 MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN)

📖 MELSEC iQ-R Motion Module User's Manual (Network)

📖 MELSEC iQ-F FX5 Motion Module User's Manual (CC-Link IE TSN)

■Writing of module extended parameters in a redundant system configuration

The following restrictions apply for writing module extended parameters to an intelligent function module in a redundant system configuration:

- Module extended parameters cannot be written to an intelligent function module via a tracking cable.
- If a CPU module in the connective system is not the one in the control system, the module extended parameters cannot be written to an intelligent function module mounted on a redundant extension base unit.

■Data in a motion module

Data in a motion module can be written by selecting the checkbox of the module extended parameters of the motion module and clicking the [Execute] button in the "Online Data Operation" screen.

To use this function, the motion control setting function Version 1.045X or later is required to be installed.

The following table shows the motion modules supporting this function and a write target of the data.

| Module | Module name | Write target of data |
|---|---|--|
| CC-Link IE TSN compatible motion module | RD78G4 RD78G8 RD78G16 RD78G32 RD78G64 RD78GHV RD78GHW | The storage destination set in the following module parameter: <ul style="list-style-type: none">• "Module Operation Setting" ⇔ "Module Extended Parameter Storage Location Setting" |

Program

When a program (local label, program body) is created, select "Program" to write.

When an initial value is set in the "Initial Value" column in a local label editor, select "Label Initial Value by Program" to write.

When an initial value is not set in the "Initial Value" column, the initial label value file is not displayed. In addition, the initial label value file with the same name in a programmable controller is deleted.

■Standard function block

When a standard function block is used in a program, the FB file "SlibFbFile" is automatically written.

However, if the FB file (SlibFbFile) is deleted manually, write the program including the standard function block again.

If all the standard function blocks used in a program are deleted, delete "SlibFbFile" set in "FB/FUN File Setting" of CPU parameter.

■Setting the secured steps for online program change

Set the range of program (program file) to be written and secured steps for online program change on the "Program Detail Setting" screen displayed by clicking the [Detail] button of "Program."

FX5CPUs do not support this setting.

| Item | Description |
|---|--|
| Allocate Memory for Online Program Change | <p>Writing programs while the CPU module is running affects scan time due to the change of number of steps.</p> <p>Enter the secured steps for online program change to handle the change of number of steps when performing the online program change.</p> <p>When the number of program steps is changed, the capacity of program files is not changed if the changed number of steps are within the range of the number of the secured steps for online program change.</p> |

■Operations after writing SFC programs

For SFC programs, the operations performs differently between Ladder, ST, and FBD/LD when changing programs by writing them to a programmable controller. For the details, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

📖 MELSEC iQ-F FX5 Programming Manual (Program Design)

Global label

When global labels are set, select "Global Label Setting" to write.

When an initial value is set in the "Initial Value" column in a global label editor, select "Global Label Initial Value" to write.

When an initial value is not set in the "Initial Value" column, the initial label value file is not displayed. In addition, the initial label value file with the same name in a programmable controller is deleted.

When "Access from External Device" is selected in a global label editor, select "Global Label Assignment Information" to write.

FX5CPUs do not support the settings for initial label values and access from external devices.

Precautions

The sample comments are included in the write target. If the data size to be written exceeds the memory capacity of the CPU module at writing data, prepare an SD memory card.

For FX5CPU, the writable capacity is the same as that of the CPU module even when data is written to an SD memory card.

Device memory

When setting values in the device memory and writing them to the device memory area of a CPU module, select "Device Memory" to write.

The device memory which has the same name as the program is written to a local device.

In contrast, the device memory which has the different name as the program is written to a global device.

Only one device memory for a global device can be selected.

To write only the values within the range specified in a device memory editor, refer to the following:

☞ Page 453 Writing/Reading Data to/from CPU Module

Precautions

FX5CPUs do not support local devices.

The device memory is written to a global device regardless of the consistency or inconsistency with a program name.

■Setting write target devices and their ranges

Set the type and range of device memory to be written to the CPU module on the "Device Data Detail Setting" screen displayed by clicking the [Detail] button of "Device Memory."

- Writable devices to a CPU module

○: Writable, ×: Not writable, △: Writable only during a simulation, —: No corresponding device

| Device | Global device | Local device ^{*1} |
|--|---------------|----------------------------|
| M, V ^{*1} , T, LT ^{*1} , ST, LST ^{*1} , C, LC, D, R ^{*2} , SAIM, SAIT, SAIST, SAIC, SAID | ○ | ○ |
| L, B, F, SB, W, SW, Z, LZ, RD ^{*1} , SAIB, SAIW | ○ | — |
| S ^{*3} , SD, SM, SAISD, SAISM | × | — |
| X, Y, SAIX, SAIY | △ | — |

*1 FX5CPUs do not support it.

*2 RCPUs and LHCPUs do not support it.

*3 Can be written to only an FX5CPU.

However, a step relay (S) is used as a step relay with block specification (BL□S) to control an SFC program if "Use" is set in "To Use or Not to Use SFC" of the CPU parameter. In this case, the step relay (S) cannot be written to the CPU module.

- Writable devices to a remote head module

○: Writable, —: No corresponding device

| Device | Global device | Local device |
|---------------|---------------|--------------|
| SB, W, SW, RD | ○ | — |

For details on the devices to be written, refer to the following:

☞ Page 929 Applicable Devices in GX Works3

File register

When setting values in the device memory and writing the values as file registers, select "File Register" to write.
FX5CPUs do not support this setting.

■Setting range to be written

Set the range of file registers to be written to a programmable controller in the "File Register Detail Setting" screen displayed by clicking the [Detail] button of "File Register."

If two or more file registers are selected, the value of each file register is written/read in the same range.

■Writing to a programmable controller

When writing file registers, perform the following procedure.

Operating procedure

1. Write the CPU parameters to a programmable controller.
2. Reset or cycle the power of the programmable controller.
3. Write file registers.

Extended file register

Values set in the device memory (extension file registers (ER)) of a project can be all written to extended file registers (ER) of an SD memory card in a batch.

It is not available in a project for an RCP. CPU.

■Range to be written

Values of the device memory (extension file registers (ER)) of a project are stored in extended file registers (ER) of an SD memory card by selecting "Extend File Register" of the SD memory card and performing writing.

All the points (32768 points) of the device memory of a project are written to extended file registers (ER) of an SD memory card regardless of the number of points of a user device set in file registers (R).

Initial device value

When an initial device value is set, select "Device Initial Value" to write.

An initial device value with the same name as a program is written as a file for a local device. A device, which cannot be used as a local device, is not written.

An initial device value with a different name from a program is written as a file for a global device.

FX5CPUs do not support local devices. The device memory is written to a global device regardless of the consistency or inconsistency of a program name.

Device comment

When a device comment is set, select "Common Device Comment" or "Each Program Device Comment" to write.
For FX5CPU, 'each program device comment' cannot be written to the CPU module.

■Setting range to be written

Set the range of "Common Device Comment"/"Each Program Device Comment" to be written to a CPU module on the "Device Comment Detail Setting" screen displayed by clicking the [Detail] button of "Common Device Comment" or "Each Program Device Comment."

Set this setting to limit the writing range of device comments in cases such as when the CPU module has small free capacity.
When the range of device comments is not set, all device comments are written.

| Item | Description |
|------------------------------------|---|
| Number of characters per 1 comment | Set the maximum number of comments to be written to a CPU module. When the character length of an input value is less than the number of characters of device comment set for the project, the device comment with less number of characters is written to a CPU module. Therefore, mismatched data may be detected when verifying project data. |

Precautions

When the sample comments are read to device comments, all the sample comments are written to the CPU module.
Therefore, the data size to be written may exceed the memory capacity of the CPU module. In this case, perform any of the following operations.

- Delete the device comments of unused devices.
- Set the write target of device comments to SD memory card.
For FX5CPU, the writable capacity of SD memory card is the same as that of CPU module.
- Set the range to be written.

Tag FB setting

In projects for an RnPCPU (process mode/redundant mode) and an RnPSFCPU, when using a program with the process control extension enabled or for which the tag FB setting is set, write the CPU parameter (only when it is set at the first time or changed) and the global label setting.

File register data in the range assigned to FB properties in a tag FB is written only one time after converting all programs (re-assigning labels).

Reading data from a programmable controller

Read data from a CPU module.

For the considerations for reading data, refer to the following:

☞ Page 613 Considerations for Online data operation

Operating procedure

1. Select the [Read] tab on the "Online Data Operation" screen.
2. Select the files to be read and read target.
3. Click the [Detail] button to set the details such as a range to be read.
4. Click the [Execute] button.

Point

Data can be read even when a project is not open.

☞ Page 106 Creating a new project by reading data read from a programmable controller

■Writing a program without writing the program restoration information

When a CPU module contains the following data, 'Read from PLC' cannot be performed.

- Execution program that the program restoration information is not written
- Execution program that the program restoration information is not written at the same time

■Operations when using CPU modules in a redundant system configuration

Data is read from the CPU module in the connective system.

■Standard function block

If a standard function block has been used in the project written to a CPU module, the data cannot be read from the CPU module to a project that satisfies either the No.1 condition or all of the No.2 conditions listed below.

| No. | Condition |
|-----|---|
| 1 | <ul style="list-style-type: none">• A standard function block that has never been used in the project written to the CPU module has been used. |
| 2 | <ul style="list-style-type: none">• A standard function block has been used.• It is not the project used for writing data to the CPU module.• It is not created by reading the project written to the CPU module. |

Read data from a CPU module while a project is not opened or the one written to the CPU module is opened.

Precautions

During the frequent access of an SD memory card with a data logging function or database function, the response to the reading operation from a programmable controller (until the "Online Data Operation" screen is displayed) could be slow.

Parameters

■Unsupported modules

The module parameters that are not supported by GX Works3 cannot be read.

■Parameters of a remote I/O module (device station) on CC-Link IE TSN

Whether or not to read parameters of a device station can be selected in the [Read] tab in the "Online Data Operation" screen.

The operating procedure is the same as the one to write parameters of a device station to a CPU module. ( Page 604

Parameters of a remote I/O module (device station) on CC-Link IE TSN)

For details on "Parameter Automatic Setting," refer to the following:

 MELSEC iQ-R CC-Link IE TSN User's Manual (Application)

 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual

 MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN)

 MELSEC iQ-R Motion Module User's Manual (Network)

 MELSEC iQ-F FX5 Motion Module User's Manual (CC-Link IE TSN)

■Data in a motion module

Data in a motion module can be read by selecting the checkbox of the module extended parameters of the motion module and clicking the [Execute] button in the "Online Data Operation" screen.

To use this function, the motion control setting function Version 1.045X or later is required to be installed.

The following table shows the motion modules supporting this function and a read source of the data.

| Module | | Read source of data |
|---|---|---|
| CC-Link IE TSN compatible motion module | RD78G4 RD78G8 RD78G16 RD78G32 RD78G64 RD78GHV RD78GHW | The storage destination set in the following module parameter: • "Module Operation Setting" ⇔ "Module Extended Parameter Storage Location Setting" |

Program

When reading a program (local label, program body), read "Program."

■Initial local label value

The operation differs between writing to and reading from the programmable controller.

- Writing: Local labels are written by selecting "Label Initial Value by Program."
- Reading: The initial local label values are also read when a program is read.

FX5CPUs do not support this initial value setting.

■Execution type which is overwritten at reading program

- When reading CPU parameters and program file at once: The program file is overwritten with the execution type in accordance with the program setting of the read CPU parameter.
- When reading a program file only: The program file is overwritten in accordance with the parameter settings in GX Works3.
- When the CPU parameter setting does not exist in both CPU module and GX Works3: The program file is overwritten with "No Execution Type."

■Setting read range

Set the range of a program (program file) to be read from a CPU module on the "Program Detail Setting" screen displayed by clicking the [Detail] button on the "Online Data Operation" screen.

In addition, the secured steps for online program change can be obtained from CPU module.

FX5CPUs do not support this setting.

Global label

■Initial value, accessing from external device

The operation differs between writing to and reading from the programmable controller.

- Writing: Global labels are written by selecting "Label Initial Value by Program" and "Global Label Assignment Information."
- Reading: The initial global label values and the information on access from external devices are also read when a program is read.

FX5CPUs do not support the settings for initial label values and access from external devices.

Restriction

When reading only a program in which global labels are used, the label definitions used in the program may not exist in the project. This may cause the disappearance of the labels on the ladder editor. In this case, read the global label and program together.

Device memory

The device memory, which have the same name as the program, will be read as a file for a local device.

The device memory, which have the different name as the program, will be read as a file for a global device.

Only one device memory for a global device can be selected.

To read only the values within the range specified in a device memory editor, refer to the following:

☞ Page 453 Writing/Reading Data to/from CPU Module

FX5CPUs do not support local devices. The device memory is read as a file for global labels regardless of the consistency or inconsistency with the program name.

■Setting read target devices and their read ranges

Set the type and range of device memory to be read from a CPU module on the "Device Data Detail Setting" screen displayed by clicking the [Detail] button.

- Readable devices from a CPU module

○: Readable, —: No corresponding device

| Device | Global device | Local device ^{*1} |
|--|---------------|----------------------------|
| M, V ^{*1} , T, LT ^{*1} , ST, LST ^{*1} , C, LC, D, R ^{*2} , SAIM, SAIT, SAIST, SAIC, SAID | ○ | ○ |
| X, Y, LB, F, SB, S, W, SD, SW, SM, Z, LZ, RD ^{*1} , SAIX, SAIX, SAIB, SAIW, SAISD, SAISM | ○ | — |

*1 FX5CPUs do not support it.

*2 RCPUs and LHCPUs do not support it.

- Readable devices from a remote head module

○: Readable, —: No corresponding device

| Device | Global device | Local device |
|-----------------------------|---------------|--------------|
| X, Y, SB, W, SD, SW, SM, RD | ○ | — |

For details on the devices to be read, refer to the following:

☞ Page 929 Applicable Devices in GX Works3

Point

To read device memory from the following memories, select the checkbox of each memory in the "Device Data Detail Setting" screen.

- Link memory
- CPU buffer memory (U□\G)

However, device memory cannot be read from the fixed scan communication area (U□\HG).

Device comment

■Setting read range

Set the range of Common device comments/Each program device comments to be read from a programmable controller on the "Device Comment Detail Setting" screen displayed by clicking the [Detail] button.

Initial device value

Even when initial device values read from a CPU module are for local devices, they are not displayed as those for local devices ('#' is not added) in GX Works3.

Tag FB setting

In projects for an RnPCPU (process mode/redundant mode) and an RnPSFCPU, when using a program with the process control extension enabled or for which the tag FB setting is set, read the global label setting.

Note that FB properties are not read.

To read the current value of an FB property, update the initial value of the FB property.

 Page 689 FB Property Management (Online) screen

Deleting data in a CPU module

Delete the data such as programs and parameters in the CPU module.

For a safety project, safety data can be deleted when the safety operation mode of a CPU module is in the test mode.

Operating procedure

1. Select the [Delete] tab on the "Online Data Operation" screen.
2. Select a file to be deleted, and click the [Execute] button.

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.

An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|--|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). If an error occurs while deleting data from the control system, it is not deleted from the standby system. If an error occurs while deleting data from the standby system, the data of control system cannot be restored to its former condition. |

Considerations for Online data operation

Unlocking a remote password

The confirmation message for unlocking the remote password is displayed when the remote password is set to the CPU module to be accessed. Unlock the password by following the message.

For details, refer to the following:

 Page 724 Restricting Access from Other Than Specific Communication Route (Remote Password)

Unusable functions while transferring programs

The following functions cannot be used while transferring a program.

- Writing data to a programmable controller
- Reading data from a programmable controller
- Verifying data with a programmable controller
- Deleting data in a programmable controller
- Reading/writing/deleting user data
- Closing a project
- Changing the module type and operation mode
- Ethernet diagnostics
- CC-Link IE Control diagnostics (optical cable)
- CC-Link IE Control diagnostics (twisted pair cable)
- CC-Link Field diagnostics
- MELSECNET diagnostics
- Changing a connection destination setting
- Circuit trace
- Simulation

Cases where the option setting is changed

The following option setting may be changed when reading data from a programmable controller.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Convert, Online Program Change Target Setting"

"Low-speed" is set in the option for the following cases:

- When reading data for which "High-speed" is selected to a project for which "Low-speed" is selected
- When reading data for which "Low-speed" is selected to a project for which "High-speed" is selected

Structures restored by reading data from a programmable controller

When reading data in which structure is used from a CPU module, the definition of the structure is restored to the state where it was written to the CPU module.

Note that if the definition of a structure is edited after writing it to a CPU module and data including the structure is read, it will return to the state before the editing.

Structure can be used in the following data.

- Standard program
- Safety program
- Standard FB
- Safety FB
- Standard FUN
- Safety FUN
- Standard global label
- Standard/safety global label
- Safety global label

Security version of a project

Depending on a security version of a project and a security version of the data written to a CPU module, the 'Writing data to a programmable controller' function or the 'Reading data from a programmable controller' function may not be performed.

The following table shows whether these functions can be performed or not for each security version.

○: Can be performed, ×: Cannot be performed

| Security version | | Writing data to a programmable controller | Reading data from a programmable controller |
|--------------------------|----------------------|---|---|
| Project currently opened | Data in a CPU module | | |
| 1 | 1 | ○ | ○ |
| | 2 | × | ×*1 |
| 2 | 1 | × | ○ |
| | 2 | ○*2 | ○*1*2*3 |

*1 Data other than the following can be read regardless of the security version:

- Program file
- FB/FUN file setting
- Global label setting file
- Safety global label setting file
- Module parameter
- Device comment

*2 Data can be written/read when a project password matches.

Note that if a project currently opened differs from the one written to a CPU module, the data cannot be written/read even if a project password matches:

*3 Password authentication is required.

Note that a security version of the data written to a CPU module cannot be checked from external parties.

Manage and operate the security version properly.

When changing the safety communication setting

When writing a project in which the following parameter is set to "Use" to an RnSFPCPU or RnPSFPCPU, then writing a project in which the parameter setting is changed to "Not to Use," initialize the memory of the CPU module, then write the project in which the parameter setting is changed.

- "Module Parameter"⇒ "Safety Communication Setting" ⇒ "To Use or Not to Use the Safety Communication Setting" of a network module.

For the method for initializing the memory, refer to the following:

📖 Page 801 Initializing/Clearing a Memory

13.2 Verifying Programmable Controller Data

This section explains the method to verify data between the open project and data in a CPU module.

This verification is used to compare the content of two projects or to locate the changes made in programs.

A project for which a security is set can be verified when both data of the verification source and verification destination are not read-protected.

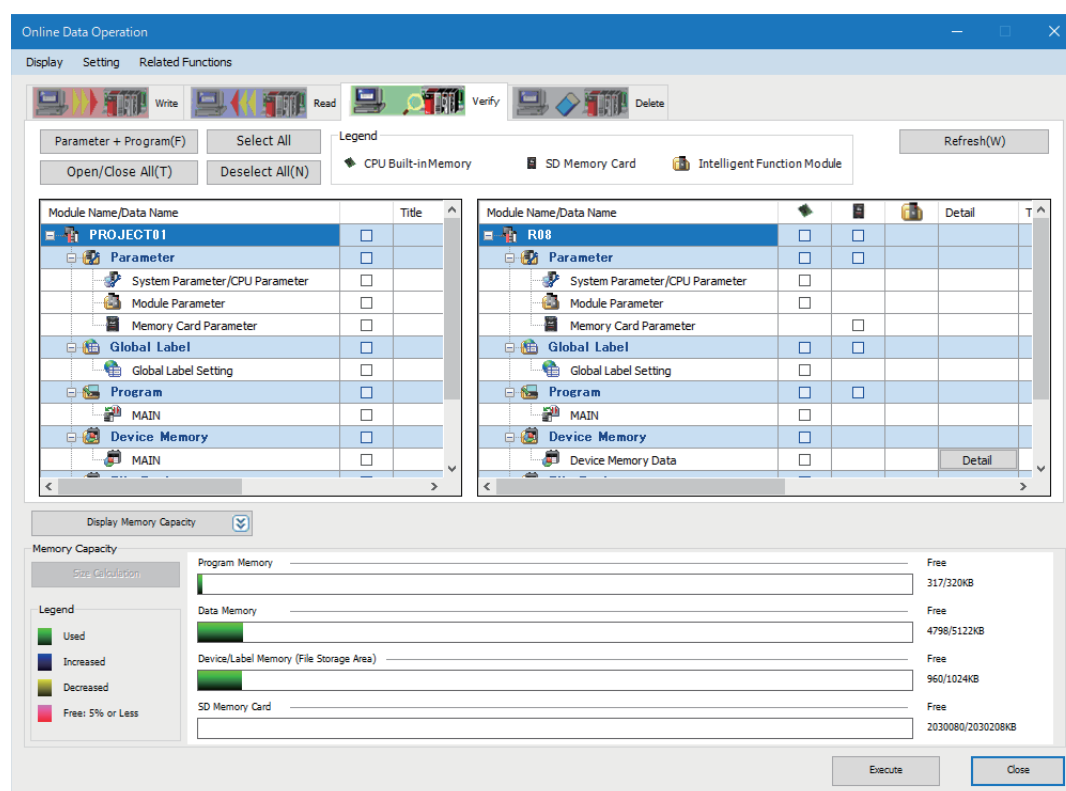
To verify data between two projects, perform the project verification.

For details, refer to the following:

☞ Page 151 Verifying Projects

Window

Select [Online] ⇒ [Verify with PLC].



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Operating procedure

Select the data to be verified, and click the [Execute] button.

A verification result is displayed in the "Verify Result" window.

However, the verification of program blocks is skipped, and "Verification process was skipped" is displayed in the "Verification Result" column.

To verify program blocks, double click the corresponding line or press the **[Enter]** key.

The operation method for displaying the verification result is the same as that of project verification. For more details, refer to the following:

☞ Page 153 Checking a verification result

Point

By selecting "No" for the following option, program blocks can be verified without being skipped.

Note that it may take time to display the verification result.

- [Tool] ⇒ [Options] ⇒ "Online" ⇒ "Verify with PLC" ⇒ "Verify the Program and FB/FUN Units Later"

■Writing a program without writing the program restoration information

When a CPU module contains the following data, the detailed verification result screen cannot be displayed.

- Execution program that the program restoration information is not written
- Execution program that the program restoration information is not written at the same time

■Verification of the control system and the standby system in a CPU module in a redundant system configuration

When verifying data in an RnPCPU (redundant mode) or an RnPSFCPU, the control system or standby system needs to be specified as the verification destination.

When verifying data in the control system and data in the standby system, compare the verification result of the CPU modules in the connective system and the standby system.

Parameters

■Module extended parameters

Module extended parameters are not verified.

However, some module extended parameters can be verified if both of the conditions listed below are satisfied.

The following table shows the conditions and modules of which the module extended parameters can be verified if the conditions are satisfied.

| Condition | Verifiable module |
|--|--|
| <ul style="list-style-type: none">• Parameters are written to an intelligent function module.• The start I/O number and the module name in the project of a verification source match those in the project of a verification destination. | <ul style="list-style-type: none">• CC-Link IE TSN compatible motion module (simple motion mode)• Simple motion module• MELSEC iQ-R positioning module• MELSEC iQ-R serial communication module• MELSEC-L LD75P/LD75D type positioning module^{*1}• MELSEC-L serial communication module^{*1} |

^{*1} Module extended parameters cannot be verified during a simulation.

■Unmatched module parameters

When verifying module parameters, the following message may appear.

- Message: Module parameters created through different versions are verified. For some items, mismatch results might be shown even if the same settings were set on the setting window.

To match the module parameters, perform the following operation, and then verify once again.

| Project | Operation |
|--------------------------|--|
| Verification source | <ol style="list-style-type: none">① Change the corresponding setting item in the parameter editor, and then restore it.② Save the project. |
| Verification destination | <ol style="list-style-type: none">① Start another GX Works3, and read the project from a CPU module. (☞ Page 106 Creating a new project by reading data read from a programmable controller)② Write the read project to the CPU module once again. (☞ Page 600 Writing data to a programmable controller) |

Device memory

In special relays and special registers of FX5CPUs, there are devices for which the values vary when a programmable controller is stopped.

Therefore, the verification result between a programmable controller and device memory may be mismatched.

Tag FB setting

In projects for an RnPCPU (process mode/redundant mode) and an RnPSFCPU, the tag FB setting is not verified.

Function/function block

In GX Works3 Version 1.036N to 1.044W, unconverted functions/function blocks in FB files/FUN files are excluded from verification.

To verify unconverted functions/function blocks, install the latest GX Works3 or perform the 'project verification.' (☞ Page 151 Verifying Projects)

13.3 Writing Programs While a CPU Module is in the RUN State

This section explains the function to change programs and data while a CPU module is running (online change).

Before using this function, be sure to fully understand the considerations.

For the detailed specifications on the online change function of a CPU module, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

There are the following two types in the online change function:

○: Available, ×: Not available

| Type | Description | Supported CPU module/remote head module | | | | |
|--------------------------|---|---|---|-------------------|-----------------|-------------|
| | | RnCPU RnENCPU RnPCPU | RnPSFCPU ^{*3} RnSFCPU ^{*4} | LHCPU | FX5CPU | RJ72GF15-T2 |
| Online program change | To partially change and write programs or data while a CPU module is running. | ○ ^{*1*2} | ○ | ○ ^{*1*2} | ○ ^{*1} | × |
| File batch online change | To write data for each file while a CPU module is running. | ○ | ○ | ○ | × | ○ |

*1 The following data in an SFC program can also be written using this function:

- Single SFC block
- Zoom

*2 This function can be used in the property screen in MELSAP-L (instruction format) display.

*3 Only standard data can be written.

*4 Data that can be written differs depending on the safety operation mode.

- Safety mode: standard data only
- Test mode: standard data and safety data

Writing data while a CPU module is running affects scan time due to the change of number of steps. Set the secured steps for online program change on the "Program Detail Setting" screen displayed by clicking the [Detail] button of "Program."

Considerations

RCPU/LHCPU/FX5CPU

- The program execution is suspended during the online program change. The length of down time depends on the number of the changed steps.
- If the online program change is performed for programs which includes the rise instructions, fall instructions, SCJ instructions, and STMR instructions, the system may not operate properly.
- Do not perform the online program change to the same program from multiple pieces of GX Works3 at the same time.
- If failed to perform the online program change, the project will be returned to the previous state before the conversion in order to make it possible to perform the online program change again.
- Make sure that the parameters between in the CPU module and in the project match before performing the online program change.
- Make sure that the writing target file has been written to the CPU module before performing the online program change.
- When "Check at Communication Time" has been set less than 90 seconds, the timeout will be checked in 90 seconds. If an error occurred, extend the timeout time on the "Specify Connection Destination" screen.
- The online program change will be continued if a warning occurs at conversion.
- When the online program change is performed after changing the label names which can be accessed from external devices, the data before the change is remained in the global label assignment information. To delete the remaining data, write the global label assignment information from the "Online Data Operation" screen.
- When global labels are changed, programs using the global labels will be a target of the online program change.
- The online program change cannot be performed when a structure definition is edited (added/deleted/changed). Write a program to a CPU module on the "Online Data Operation" screen. However, it can be performed when a new member is added in the state that there is no member of a structure or when all members of the structure are edited.
- In a ladder with a large number of steps, the online program change may not be performed due to insufficient memory in GX Works3.
In this case, close all open editors and perform the online program change again.
Or, convert a program and then perform the file batch online change.
- When the step No. in the writing range has been registered as a condition of a device test with execution conditions, the registration will be canceled.
- When performing the online program change for data including a safety program, the safety program is not executed until writing of the program is completed. Confirm that the system is safely operating before performing the online program change.
- Do not perform the online program change for data including a safety program while switching the safety operation mode of an RnSFCPU to the safety mode.
- If a recording setting exists in a CPU module, write the setting when performing the online program change. Otherwise, a recording setting error may occur when starting recording.

Design instructions

WARNING

■ When data change, program change, or status control is performed from a personal computer to a running programmable controller, create an interlock circuit outside the programmable controller to ensure that the whole system always operates safely.

Furthermore, for the online operations performed from a personal computer to a CPU module, the corrective actions against a communication error due to such as a cable connection fault should be predetermined as a system.

CAUTION

■For online operations performed from a personal computer to a running CPU module (program change while a CPU module is in RUN, operating status changes such as RUN-STOP switching, and remote control operation), read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.

When changing a program while the CPU module is in RUN, it may cause a program corruption in some operating conditions. Fully understand the precautions described in this section.

Online program change

This online program change converts and writes a program and/or data edited in an engineering tool at the same time while a CPU module is running.

Before changing a program, make sure that the program matches with the one in the CPU module by verifying data with a programmable controller. If there is no file to be changed, the online program change cannot be performed.

The following table shows available data change operations and applicable files for the online program change.

○: Applicable, —: Not applicable

| Operation | | Applicable file for online program change | | | | |
|----------------|-----------------------------------|---|-----|---|--|--|
| | | Program | POU | Initial local label value* ¹ | Global label (settings, assignment information* ¹) | Initial global label value* ¹ |
| Global label | Adding/changing global labels | — | — | — | ○* ² | ○* ³ |
| Program block | Adding/changing local labels | ○ | — | ○* ³ | — | — |
| | Adding/changing/deleting programs | ○ | — | — | — | — |
| Function block | Adding/changing local labels | — | ○ | — | — | — |
| | Adding/changing/deleting programs | — | ○ | — | — | — |
| Function | Adding/changing local labels | — | ○ | — | — | — |
| | Adding/changing/deleting programs | — | ○ | — | — | — |


*¹ FX5CPUs do not support it.

*² The operation for the assignment information can be performed only when the labels are set to be accessed from external devices.

*³ The operation for an initial label value file can be performed only when initial label values are set. When the initial values are not applied to labels, the initial label value file with the same name in a programmable controller will be deleted.

Operating procedure

1. Check that programs are matched with ones in a programmable controller.

When some data to be written is mismatched with a program in a CPU module, the online program change cannot be performed. Write each file by using the file batch online change. ( Page 625 File batch online change)

2. Modify a program.

3. Select [Convert] ⇄ [Online Program Change].

4. Select a program to write, and click the [Yes] button.

Point

Check the processing procedure and precautions for the online program change by clicking the [Precautions] button.

Online program change of SFC programs

The online program change of an SFC program can be performed by the following methods:

- Performing the online change (SFC block)
- Performing the online program change for a Zoom
- Performing the online program change in the property screen in MELSAP-L (instruction format) display (FX5CPUs do not support this method.)

■Deleting an SFC block

To perform the online program change after deleting an SFC block, perform the following operations.

1. Select and right-click an SFC block to be deleted in the navigation window, then select [Delete Data] from the shortcut menu.
2. Select [Convert] ⇒ [Online Program Change].

Precautions

- The online program change cannot be performed when multiple SFC blocks are edited or an SFC program is deleted. In that case, write data to a CPU module in the "Online Data Operation" screen.
- The online program change cannot be performed when changing the display format (type) of a transition to device/label by the following operations. In that case, write data to a CPU module in the "Online Data Operation" screen after converting all programs.

1. Select [Edit] ⇒ [Change Type of Transition].
2. Set each item in the "Change Type of Transition" screen as follows, and click the [OK] button.
 - Target to change: All Blocks
 - Target Contact: All

Online program change after editing device comments

When the online program change is performed after editing device comments, the device comments are written after writing programs.

The operations below can be chosen for writing device comments by selecting [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Online Program Change."

| Item | Value | Description |
|---------------------------------|-------|--|
| Check Device Comment Difference | No | The confirmation message does not appear, and all device comments are written. |
| | Yes | The confirmation message appears, and whether or not to write device comments can be selected. |

Note that the online program change cannot be performed even if only device comments were edited with the program or labels unchanged.

To write only device comments while a CPU module is running, use the "Online Data Operation" screen.

Online program change for initial label values (version 1.000A only)

After adding/changing labels, the initial label value file needs to be written to a CPU module.

In addition, when clearing all initial values, the initial label value file needs to be deleted from a CPU module.

During the boot operation, an initial label value file needs to be written to the SD memory card in the CPU module. To clear all initial values, the file needs to be deleted from the boot file setting of the memory card parameter. If the file is not written to the CPU module or not deleted, an error occurs when resetting or turning the power of the CPU module OFF and ON, or switching the operating status from STOP to RUN.

Online program change for initial label values (version 1.032J or later)

When an initial label values are not set, the initial label value file with the same name in a programmable controller will be deleted.

During the boot operation, an initial label value file needs to be written to the SD memory card. By selecting the checkbox of "Reflect Changes to Boot Source" when performing the online program change, an initial label value file is written even if an initial label value is not set.

Online program change during recording operation

When performing the online program change during recording operation, whether or not to write a recording setting can be selected.

By selecting the checkbox of "Update Recording Setting," a recording setting is written after writing programs.

A recording setting can be updated if the boot operation is not in process, or if the boot operation is in process but the checkbox of "Reflect Changes to Boot Source" is not selected when the online program change is performed.

Writing range for online program change

The range to be written differs depending on the editing methods of programs.

■Ladder program

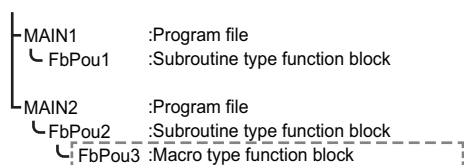
When a new ladder block is inserted, or a ladder block is deleted, the inserted program is written together with one instruction after the inserted ladder block to the CPU module.

Therefore, the online program change may not be completed at a time depending on the number of program steps before and after addition or deletion. In this case, reduce the number of steps written at a time and perform the online program change in several times.

Execution of rising/falling instructions after performing online program change

When the raising/falling instructions in the subroutine function block program are modified or added, the instructions do not operate normally immediately after the online program change is performed even if the execution condition is satisfied.

This is the same as the case of the macro type function block in the subroutine function block in the following example of program configuration.



For details, refer to the following:

MELSEC iQ-R CPU Module User's Manual (Application)

POU duplication check

When performing the online program change, the program can be checked whether a POU name is duplicated in the program and in a program in a CPU module.

Whether to check the duplication can be set by setting the following option.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Online Program Change" ⇒ "Operational Setting" ⇒ "Duplication Check for POU"

Program transfer during the online program change

A program can be transferred (i.e. the program restoration information are written and the program memory are transferred) in the background during the online program change.

By doing so, the waiting time until the program becomes editable can be shorten.

The following conditions need to be satisfied to transfer a program in the background.

- "Write in Background" is selected in the following option.

[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Online Program Change" ⇒ "Operational Setting" ⇒ "Write a Program Restore Information"

- The boot operation is not in process. Or, the boot operation is in process but the checkbox of "Reflect Changes to Boot Source" is not selected when the online program change is performed.

This function is available only in projects for an RnCPU, RnENCPU, RnPCPU, RnSF CPU, and LH CPU.

Precautions

■ Interruption of writing the program restoration information

When the power-OFF or reset of a CPU module, or cable disconnection is detected while writing the program restoration information, the processing is canceled and a message appears.

For the interruption caused by the power-OFF or reset of a CPU module, write the program restoration information again.

For the interruption caused by the cable disconnection, connect the cable again, and click the [Retry] button on the message.

When the [Cancel] button is clicked, the following error occurs.

- The restoration information is not written. Therefore, an error occurs when reading the data from a programmable controller and it is not read.
- The execution program and the restoration information may be mismatched. Therefore, an error occurs after resetting the programmable controller and the program cannot be executed.

To clear the errors, set the CPU module in the STOP state and write the program again.

Program restoration information

Whether or not to write program restoration information can be selected when performing the online program change.

By setting the following option, whether or not to write the program restoration information can be selected in the "Online Program Change" screen.

- [Tool] ⇒ [Options] ⇒ "Online" ⇒ "Program Restore Information" ⇒ "Operational Setting" ⇒ "Enable the setting to write/not to write program restore information"

When a program is written without writing the program restoration information, the data cannot be read with 'Read from PLC,' and the detailed verification result screen cannot be displayed with 'Verify with PLC.'

For CPU modules that do not support this function, whether to write the program restoration information cannot be selected even when the option is set.


Separate writing of a program and program restoration information (FX5CPU only)

When writing data to an FX5CPU by using the online program change function, a program and program restoration information can be written separately by setting "Yes" for the following option:

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Online Program Change" ⇒ "Operational Setting" ⇒ "Divide to Write a Program and Program Restore Information"

By writing a program and program restoration information separately, an error that occurs when the capacity of data to be written to an FX5CPU exceeds the maximum writable capacity may be cleared.

Precautions

- It may take time to write data when writing a program and program restoration information separately.
- A project is automatically saved with the data writing. Therefore, it is necessary to register the project history in advance.
( Page 168 Project Revision History)
- If a project is not saved automatically, the data will also not be written to an FX5CPU.
- When writing fails, reset or cycle the power of the FX5CPU. Then, write the data to the FX5CPU in the STOP state.

Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.

An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|---|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to the CPU module in the connective system. A program is transferred to the other system after performed in the connective system. |

File batch online change

A program and/or data can be written for each file while a CPU module is running.

FX5CPUs do not support this function.

Operating procedure

Select [Online] ⇒ [Write to PLC] while a CPU module is running.

Precautions

If there is not enough free capacity in the program memory of a CPU module to write the programs, the file batch online change cannot be performed.

If labels and module parameters are not changed when using a module label, writing the module parameter is omitted and the file batch online change of the program can be performed.

Execution condition

The following table shows the files to which the file batch online change can be performed and the conditions.


Before writing a file other than the one described in the following table, change the status of the CPU module to STOP/PAUSE.

■ Projects for an RnCPU, RnENCPU, RnPCPU, and LHCPU

| File | Condition |
|---|---|
| <ul style="list-style-type: none"> Initial global label value Initial local label value Device memory File register Initial device value Common device comment Each program device comment Device station setting | No condition |
| <ul style="list-style-type: none"> Program file (A local label/global label/FB/FUN is not used.) | <ul style="list-style-type: none"> Registered in the program setting of the CPU parameter. Described in Ladder Diagram, Structured Text, or Function Block Diagram. |
| <ul style="list-style-type: none"> Program file^{*1} (A local label/global label/FB/FUN is used.) | <ul style="list-style-type: none"> Registered in the program setting of the CPU parameter. Described in Ladder Diagram, Structured Text, or Function Block Diagram. All programs have not been converted since the previous writing of the file to a CPU module.^{*2} A local label has not been added, changed, or deleted since the previous writing of the file to a CPU module. |
| <ul style="list-style-type: none"> FB/FUN file^{*1} | <ul style="list-style-type: none"> Registered in the FB/FUN file setting of CPU parameters. All programs have not been converted since the previous writing of the file to a CPU module.^{*2} A local label has not been added, changed, or deleted since the previous writing of the file to a CPU module. |
| <ul style="list-style-type: none"> Global label setting^{*1} | <ul style="list-style-type: none"> A global label that can be accessed from an external device is not set. All programs have not been converted since the previous writing of the file to a CPU module.^{*2} A global label has not been added, changed, or deleted since the previous writing of the file to a CPU module. |

*1 Before performing the file batch online change, a file to be written must be set in advance by using special relays (SM) and special registers (SD).

For details, refer to the following manual. (RCPU only)

 MELSEC iQ-R CPU Module User's Manual (Application)

*2 If "No" is selected for the following option, the file batch online change can be performed even when any or all programs are converted (retained).

[Tool] ⇒ [Options] ⇒ "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Turn PLC to STOP in writing to PLC after executing Rebuild All and execute remote RUN"


■ Projects for an RnSF CPU and RnPSF CPU

| File | Condition |
|---|---|
| <ul style="list-style-type: none"> Initial global label value Initial local label value Device memory File register Initial device value Common device comment Each program device comment | No condition |
| <ul style="list-style-type: none"> Program file (A local label/global label/FB/FUN is not used.) | <ul style="list-style-type: none"> Registered in the program setting of the CPU parameter. It is for a standard program.*¹ Described in Ladder Diagram, Structured Text, or Function Block Diagram. |
| <ul style="list-style-type: none"> Program file (A local label/global label/FB/FUN is used.) | <ul style="list-style-type: none"> Registered in the program setting of the CPU parameter. It is for a standard program.*¹ Described in Ladder Diagram, Structured Text, or Function Block Diagram. A standard/safety shared label is not used.*¹ An FB/FUN used in a program has not been edited since the previous writing of the file to a CPU module. A structure has not been edited since the previous writing of the file to a CPU module. All programs have not been converted since the previous writing of the file to a CPU module.*³ A local label has not been added, changed, or deleted since the previous writing of the file to a CPU module. A global label has not been added, changed, or deleted since the previous writing of the file to a CPU module. A file to be written with a program file is a global label setting file, FB file (including SlibFbFile), or FUN file. Secured steps for online program change of FB files and FUN files have not been changed. A security setting for an FB file or FUN file has not been changed. |
| <ul style="list-style-type: none"> FB/FUN file*² | <ul style="list-style-type: none"> Registered in the FB/FUN file setting of CPU parameters. It is for a standard FB/FUN.*¹ All programs have not been converted since the previous writing of the file to a CPU module.*³ A local label has not been added, changed, or deleted since the previous writing of the file to a CPU module. |
| <ul style="list-style-type: none"> Global label setting*² | <ul style="list-style-type: none"> It is for a standard global label.*¹ A global label that can be accessed from an external device is not set. All programs have not been converted since the previous writing of the file to a CPU module.*³ A global label has not been added, changed, or deleted since the previous writing of the file to a CPU module. |

*¹ A condition to write the file to an RnPSF CPU.

*² Before performing the file batch online change, a file to be written must be set in advance by using special relays (SM) and special registers (SD).

For details, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

*³ If "No" is selected for the following option, the file batch online change can be performed even when any or all programs are converted (retained).

[Tool] ⇒ [Options] ⇒ "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Turn PLC to STOP in writing to PLC after executing Rebuild All and execute remote RUN"

13.4 Reading/Writing/Deleting User Data

Read/write/delete user data from/to the CPU built-in memory/SD memory card.

The user data written to the CPU built-in memory/SD memory card can be used in sequence programs.

The files which have a three-character extension (example: csv, txt, bin, xml) can be used as a user data.

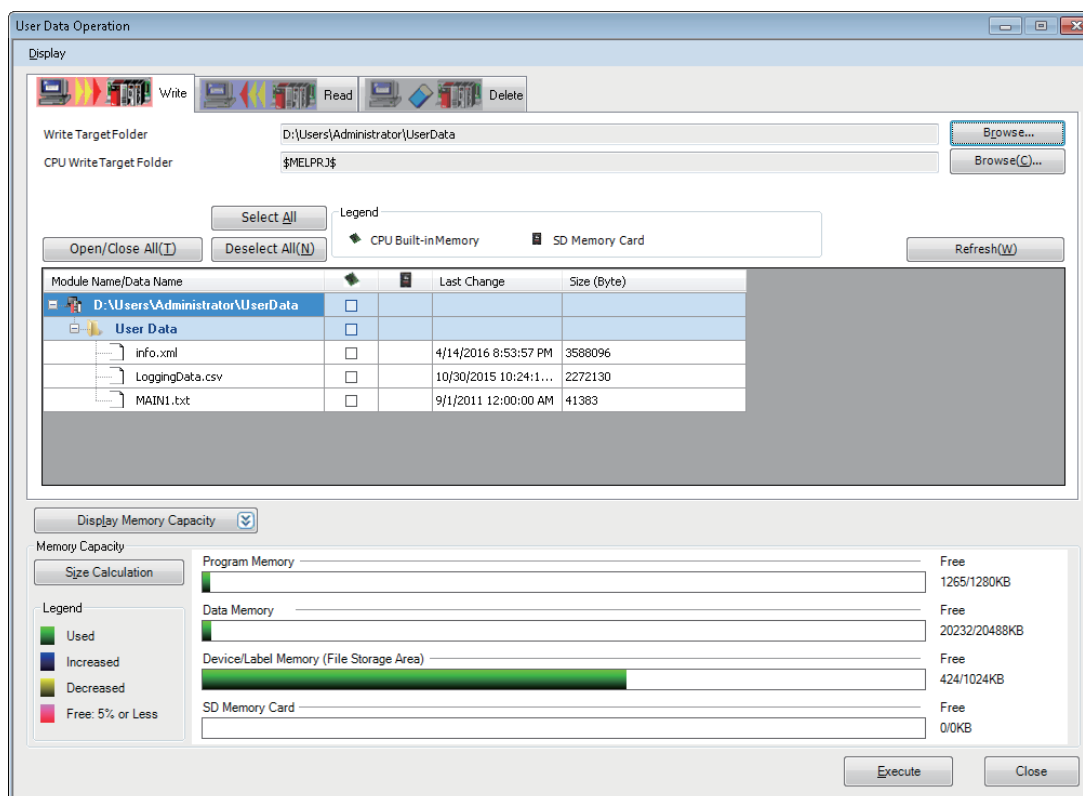
However, some extensions and files are not supported. Unsupported files are not displayed on the screen.

For FX5CPUs, a firmware update prohibited file (FWUPDP.SYU) can be written, read, and deleted.

Window

Select [Online] ⇒ [User Data] ⇒ [Write]/[Read]/[Delete].

The following screen is an example when writing data.



Operating procedure

1. Select [Write], [Read], or [Delete] tab on the "User Data Operation" screen.
2. Select the target files, and a write target or read source.
3. Click the [Execute] button.

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.

An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|---|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). |

Creating/deleting folders, changing folder name

A folder can be created in the CPU built-in memory or SD memory card.

A created folder can be deleted and the folder name can be changed.

Create/delete a folder, or change a folder name on the "Browse Folders" screen displayed by clicking the [Browse] button on the "User Data Operation" screen.

■Creating folders

Select a place in which the folder is to be created in the "Browse Folders" screen, right-click it and select [Create Folder] from the shortcut menu.

■Deleting folders/changing folder name

Select a folder in the "Browse Folders" screen, right-click it and select [Delete Folder]/[Change Folder Name] from the shortcut menu.

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.

An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|---|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). |

13.5 Deleting All Files (Initialization)

Memories can be initialized when using a CPU module and SD memory card for the first time or clearing all data stored in them.

Once the memories are initialized, the following processing is performed on each memory.

- Data memory: All folders/files in the program memory and data memory are deleted.
- Device/label memory: All files in the file storage area in the device/label memory are deleted.
- SD memory card: All folders/files in the SD memory card are deleted.

For the operation methods, refer to the following:

☞ Page 801 Initializing/Clearing a Memory

13.6 Reading/Writing the Label Memory

The label memory (current values of labels) can be read from/written to a CPU module.

By reading the label memory from a CPU module in advance, it can be written to the CPU module as necessary.

For the operation methods, refer to the following:

☞ Page 803 Reading/Writing the Label Memory

Ex.

When writing a program to a CPU module after converting (reassigning) all programs, the values of labels can be restored by writing the label memory that was read in advance to the CPU module.

13.7 Writing/Reading Data to/from Memory Card

This section explains the operations for writing/reading data to/from an SD memory card inserted in a personal computer. These operations are used, for example, when data cannot be written to/read from an SD memory card inserted in a CPU module.

However, data of a safety project cannot be written or read.

For details on the writing/reading data to/from a CPU module where an SD memory card is inserted, refer to the following:

☞ Page 597 Writing/Reading Programmable Controller Data

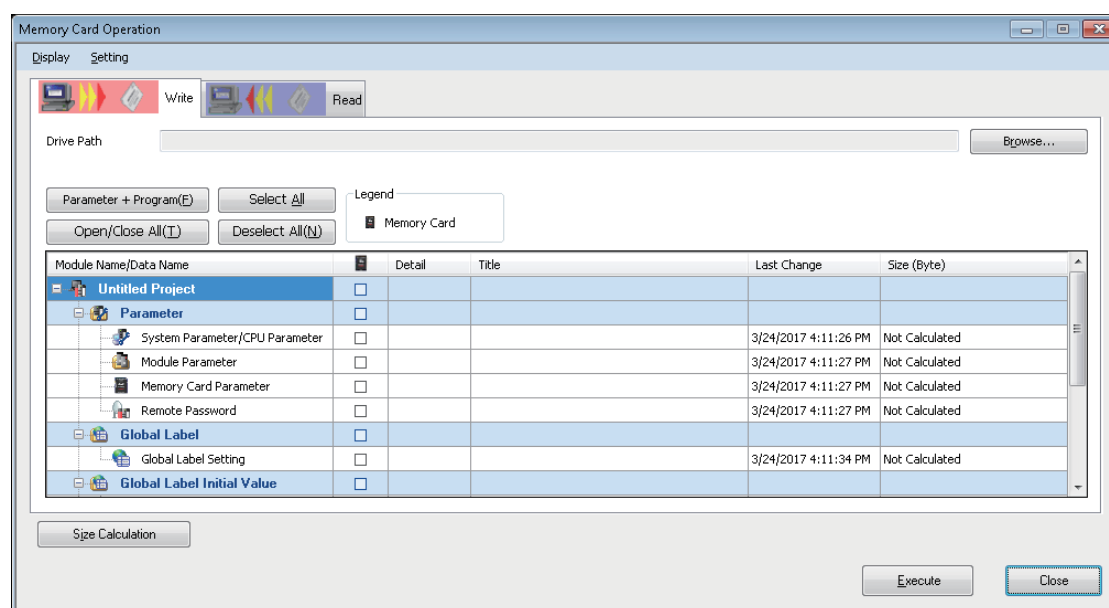
R00CPU and remote head modules do not support this function.

Configuration of the memory card operation screen

Window

Select [Tool] ⇒ [Memory Card] ⇒ [Write to Memory Card]/[Read from Memory Card].

The following screen is an example when writing data.



- The data name in gray indicates that it is in the unconverted state.
- Size of the selected data can be displayed in the "Size (Byte)" column by clicking the [Size Calculation] button.

Writing to/Reading from a memory card

Write/Read data to/from an SD memory card.

The file, which is in the '\$MELPRJ\$' folder of the specified drive path, is the target for reading/writing.

Operating procedure

1. Select the [Write] tab/[Read] tab on the "Memory Card Operation" screen.
2. Set the drive path of the write target/read source, then click the [Execute] button.

Considerations when reading program files from a memory card

Perform the following operations to read program files from an SD memory card.

■Parameters have been written with program files when writing to a memory card

Read the parameters with the program files.

■Parameters have not been written with program files when writing to a memory card

Before reading the program files, open the project opened when writing to the SD memory card.

Read parameters used when writing to the SD memory card from the CPU module.

File password function

By using the file password function, illegal reading and writing of files in an SD memory card can be prevented.

For details, refer to the following:

 Page 717 Preventing Illegal Data Reading/Writing (File Password)

14 CHECKING OPERATION OF PROGRAMS

This chapter explains the method for checking the execution status of an intelligent function module and a CPU module connected to a personal computer.

The functions to check the execution status are as follows:

| Purpose | Function name | Reference |
|--|---|--|
| To check the status of programs being executed on a program editor | Monitor | Page 636 Checking Execution Programs on a Program Editor |
| To check the current values of devices or buffer memory in a batch | Device/buffer memory batch monitor | Page 654 Checking Device/Buffer Memory in a Batch |
| To check the current values of devices and labels by registering them | Watch | Page 658 Checking Current Values by Registering Devices/Labels |
| To check input/output devices, which are registered to a CPU module, to be turned ON/OFF forcibly | Registering/canceling forced input/output | Page 666 Turning Input/Output Devices ON/OFF Forcibly |
| To check the operation of a program by changing a device or label value at the specified timing | Device test with execution condition ^{*1} | Page 668 Changing Device/Label Value by Setting Conditions |
| To set the current values of FB properties as the initial values | FB property management (online) ^{*1} | Page 689 Setting Current Values of FB Properties as their Initial Values |
| To check tag data | Faceplate ^{*2} | Page 684 Checking tag data on the gauge window (faceplate) |
| | PX Developer Monitor Tool interaction ^{*2} | Page 688 PX Developer Monitor Tool interaction |
| To pause and restart the operation of a process control function block in a running program | Pause FB/restart FB ^{*2} | Page 672 Pausing/Restarting the Operation of Function Blocks |
| To measure the scan time of any sections in a program | Scan time measurement ^{*3} | Page 675 Measuring the Scan Time of a Program |
| To check the processing time of a program being executed. | Program list monitor ^{*1} | Page 677 Checking the Processing Time of a Program |
| To check the number of executions of an interrupt program used in a program. | Interrupt program list monitor ^{*1} | Page 679 Checking Execution Counts of Interrupt Programs |
| To check the I/O signals and the current value of buffer memory by registering the module information of an intelligent function module. | Intelligent function module monitor | Page 680 Checking Current Values in an Intelligent Function Module |
| To check the current logging data collected by a CPU module. | Realtime monitor | Page 683 Checking Current Logging Data |

^{*1} Cannot be used in FX5CPUs.

^{*2} Can be used in projects for an RnPCPU (process mode/redundant mode) and an RnPSFCPU with the process control extension enabled.

^{*3} Can be used in RnCPUs, RnENCPUs, and RnSFCPU.

Changing current values

The operation of a module can be checked by changing the current value of devices, labels, and buffer memory using the change current value function.

This function turns bit devices forced ON/OFF on a CPU module. The current values of the word device and buffer memory can also be changed forcibly.

The current values can be changed on the following screens.

- Program editor
- "Device/Buffer Memory Batch Monitor" window
- Watch window
- Intelligent function module monitor window

Safety devices/labels and standard/safety shared labels can be changed only when the safety operation mode of a CPU module is in the test mode.

Point

- If "Execute END Processing between Programs" is selected for "Device/Label Access Service Processing Setting" in "CPU Parameter," the current values are changed after a program is executed or when the END processing is executed.
- When selecting a program with the specified program monitor function, the current values are changed after executing the selected program. For details on the specified program monitor function, refer to the following:
☞ Page 633 When monitoring devices/labels in a specified program

Precautions

When using the write-protect function for device data (from outside the CPU module), the current values of a device to which writing data is prohibited cannot be changed.

For details on the write-protect function for device data (from outside the CPU module), refer to the following:

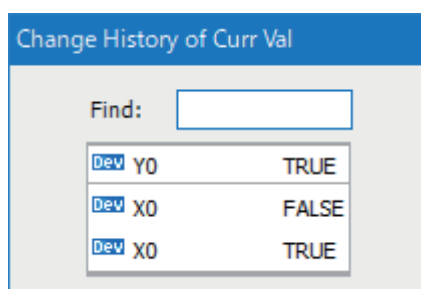
📖 MELSEC iQ-R CPU Module User's Manual (Application)

Change history of current value

When the current values of bit device are changed, the change history can be checked.

Window

Select [Debug] ⇒ [Change History of Current Value].







14.1 Monitor Status

To check the operating status of a CPU module and an intelligent function module, connect a personal computer to the CPU module and start monitoring.

Starting/stopping monitoring

Start/stop monitoring by selecting one of the following menus.

- [Online] ⇒ [Monitor] ⇒ [Start Monitoring]()/[Stop Monitoring]()
- [Online] ⇒ [Monitor] ⇒ [Start Monitoring (All Windows)]()/[Stop Monitoring (All Windows)]()
- [Online] ⇒ [Watch] ⇒ [Start Watching]/[Stop Watching]
- Select [Online] ⇒ [Monitor] ⇒ [Monitor Mode] on the active ladder editor

For a ladder editor, start monitoring by selecting a mode from the pull-down list for the ladder edit mode, which is in the upper left of the editor.

Point

By selecting "Yes" for the following option, monitoring for all the windows are stopped automatically when data is converted or all programs are converted during monitoring.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Stop the Monitor in Executing Convert/Rebuild All"

14

■When monitoring multiple projects using a single personal computer

- If a communication error has occurred in one of the projects, the monitoring speed of the other projects may become slow. The operation speed will be back to normal after closing the error message displayed in the project in which the communication error occurred.
- The following functions may not be performed normally:
Program list monitor, interrupt program list monitor, and scan time measurement

■Monitoring buffer memory or link devices

Monitor the ON/OFF state of the buffer memory or link devices (example: U0\G0.1) by setting the following option.

- [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Common Item"/"(Program editor)" ⇒ "Operational Setting"

■Changing display format of word devices

Select [Online] ⇒ [Monitor] ⇒ [Change Value Format (Decimal)] / [Change Value Format (Hexadecimal)] to change the display format of the monitored values.

■FB instance

To monitor the devices/labels in an FB instance, open the FB program and select the FB instance to be monitored from the monitor status bar.

■When monitoring devices/labels in a specified program

To monitor devices/labels after executing a specified program, select "Yes" for the following option, then select a program file to be monitored from the monitor status bar.

- [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Common Item" ⇒ "Timing to Execute Monitor Function and Modify Value Function" ⇒ "After the execution of specified program"

RnCPUs, RnENCPU, and RnSFCPU support this option.

Point

When selecting "Use File Register of Each Program" in "File Register Setting" in "CPU Parameter," file registers in a specified program can be monitored by using the specified program monitor function.

For considerations when monitoring file registers, refer to the following:

☞ Page 639 Considerations when monitoring file registers

Precautions

During specified program monitoring, local device values in a selected program are displayed as the current values of local devices in other programs.

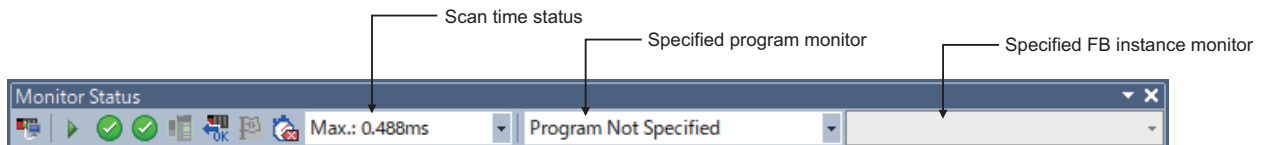
Status monitoring

Status is displayed during monitoring on the monitor status bar.

Window





At the start of monitoring

The following screen is an example for an RnCPU project.



Displayed items

| Item | Description | Icon | Detail |
|---|---|------|--------------------------------|
| Connection status | The connection status with a CPU module is displayed. The "Specify Connection Destination" screen appears by clicking the icon. For details, refer to the following: ☞ Page 577 SETTING ROUTE TO CPU MODULE | | When connected to a CPU module |
| CPU operation status | The CPU module status which is operated by the key switch on a CPU module or remote operation of GX Works3 is displayed. The "Remote Operation" screen appears by clicking the icon. For details, refer to the following: ☞ Page 789 Remote Operation | | RUN |
| | | | STOP |
| | | | PAUSE |
| ERROR status | The ERROR LED status of a CPU module is displayed. The "Module Diagnostics" screen appears by clicking the icon. For details, refer to the following: ☞ Page 733 Module Diagnostics | | ERROR is OFF. |
| | | | ERROR is ON. |
| | | | ERROR is flashing. |
| USER status | The USER LED status of a CPU module is displayed. The "Module Diagnostics" screen appears by clicking the icon. For details, refer to the following: ☞ Page 733 Module Diagnostics | | USER is OFF. |
| | | | USER is ON. |
| | | | USER is flashing. |
| Registration status (Forced input/output) | The registration status of forced input/output is displayed. The "Register/Cancel Forced Input/Output" screen appears by clicking the icon. For details, refer to the following: ☞ Page 666 Turning Input/Output Devices ON/OFF Forcibly | | Registered |
| | | | Not registered |
| Registration status (Device test with execution conditions) | The status of a device test with execution conditions is displayed. The "Check/Disable Register Device Test With Execution Condition" screen appears by clicking the icon. For details, refer to the following: ☞ Page 668 Changing Device/Label Value by Setting Conditions | | Registered |
| | | | Not registered |
| Control/standby system status | The status (control or standby system) of a CPU module in a redundant system configuration or remote head module is displayed. | | Control system |
| | | | Standby system |
| | | | Not determined |
| System A/B status | The status (system A or B) of a CPU module in a redundant system configuration is displayed. | | System A |
| | | | System B |
| | | | Not determined |
| Redundant operation mode | The operation mode of a CPU module in a redundant system configuration is displayed. | | Backup mode |
| | | | Separate mode |
| Safety operation mode | The safety operation mode of an RnPSFCPU or an RnSFCPU is displayed. The "Switch Safety Operation Mode" screen appears by clicking the icon. For details, refer to the following: ☞ Page 794 Safety operation mode switching | | Safety mode |
| | | | Test mode |

| Item | Description | Icon | Detail |
|---|--|---|----------------|
| Availability of data reading from a programmable controller | Availability of data reading from a programmable controller is displayed. |  | Available |
| | |  | Unavailable |
| Scan time clear* ¹ | The maximum and minimum values of scan time can be cleared by clicking the icon during monitoring. |  | Monitoring |
| | |  | Not monitoring |
| Scan time status | The current value, maximum value, and minimum value of scan time can be displayed by switching them from the pull-down list. | | |
| Specified program monitor* ² | Specify a program file to be monitored. | | |
| Specified FB instance monitor | When monitoring an FB program, select an FB instance to be monitored. | | |

*¹ LHCPUs do not support it.

*² LHCPUs and FX5CPUs do not support it.

Monitor mode

A ladder editor is switched to the monitor mode during a monitoring.

 Page 276 Configuration of a ladder editor

Operations when the system is switched in the redundant configuration

When a tracking communication error occurs while monitoring via CC IE Control, CC IE Field, CC-Link, MELSECNET/H, or Ethernet in a redundant configuration, monitoring is continued by switching a communication route (the system to be monitored).

This function performs when specifying any one of control system, standby system, system A, or system B as a connection destination.

Supported monitor function: circuit monitor, watch, device/buffer memory batch monitor, local device monitor

14.2 Checking Execution Programs on a Program Editor

Use the monitoring function to check the following execution programs on each program editor.

- Ladder program
- ST program
- FBD/LD program
- SFC program

Open a program editor to be monitored in advance.

Point

The display format and detailed operation settings for each function can be set by setting the following option.
[Tool] ⇒ [Options] ⇒ "Monitor"

Applicable monitoring devices and labels

■Applicable devices

The following table shows the devices that can be monitored on a program editor.

For the available devices in a CPU module, refer to the user's manual of each module.

| Program editor type | Module type | Device |
|-------------------------|-------------|---|
| Ladder, ST, FBD/LD, SFC | RCPULHCPU | X, Y, M, L, B, F, SB, V, S ^{*1} , T ^{*2} , T(TS), T(TC), T(TN), ST ^{*2} , ST(STS), ST(STC), ST(STN), LT ^{*2} , LT(LTS), LT(LTC), LT(LTN), LST ^{*2} , LST(LSTS), LST(LSTC), LST(LSTN), C ^{*2} , C(CS), C(CC), C(CN), LC ^{*2} , LC(LCS), LC(LCC), LC(LCN), D, W, SW, FX, FY, SM, SD, J□\X, J□\Y, J□\B, J□\SB, J□\W, J□\SW, U□\G, U3E□\G, U3E□\HG, DX ^{*3} , DY ^{*3} , Z, LZ, R, ZR, RD, BL, BL□\S, SAIM, SAIMS, SAIX, SAIY, SAIB, SAID, SAISD, SAIW, SAIT(TC), SAIT(TS), SAIT(TN), SAIT, SAIC(CC), SAIC(CS), SAIC(CN), SAIC, SAIST(STC), SAIST(STS), SAIST(STN), SAIST |
| | FX5CPU | X, Y, M, L, B, F, SB, S, T ^{*2} , T(TS), T(TC), T(TN), ST ^{*2} , ST(STS), ST(STC), ST(STN), C ^{*2} , C(CS), C(CC), C(CN), LC ^{*2} , LC(LCS), LC(LCC), LC(LCN), D, W, SW, SM, SD, U□\G, Z, LZ, R, BL, BL□\S |

*1 Can be monitored in a Zoom or on an SFC diagram only. To monitor a step relay (S) in a program editor other than a Zoom, monitor a step relay with block specification (BL□\S).

*2 The same value as the current value (N) is displayed.

*3 Cannot be monitored on an SFC diagram.

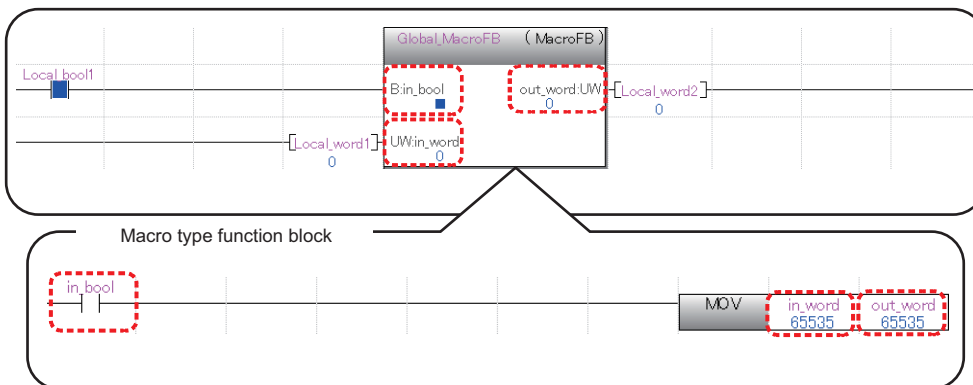
■Inapplicable labels

- When a value other than a fixed value is used for an array index, the monitor value of the array is displayed as an indefinite value, or the monitor value is not displayed.
- An indefinite value is displayed as the monitor value of a local label in a function, or the monitor value is not displayed.

Macro type function block

- Whether or not the input/output label of a macro type function block can be monitored depends on the monitoring status of an element which is connected to the input/output label. When a connected element is in the state where it cannot be monitored, the input/output label also cannot be monitored.
- When one FB instance is used for multiple times and if the input/output label of each FB instance is connected to a different device or label, the monitor values of the input/output label is not displayed properly.
- When a global label (structure type, array type, etc.) is connected with the input/output label of a macro type function block and if the program body of the block is monitored, the monitor values of the input/output label may not be displayed properly.
- When a local label is connected with the input/output label of a macro type function block which is registered as a global label and if the program body of the block is monitored, the monitor values of the input/output label may not be displayed properly.

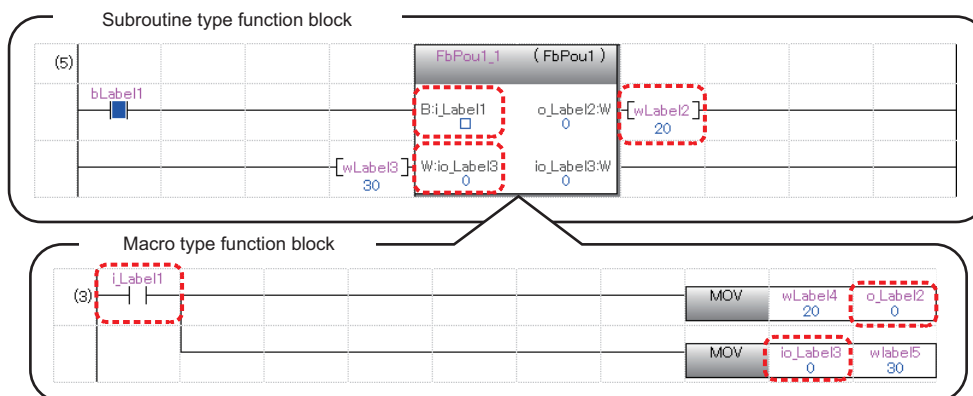
Ex.



- When a macro type function block is used in a subroutine type function block, the monitor values of the input/output labels of the macro type function block may not be displayed properly.

In that case, edit the input and output circuit parts of the macro type function block to change the program status to the unconverted state, then convert the program or perform the online program change. By doing so, the monitor values may be displayed properly.

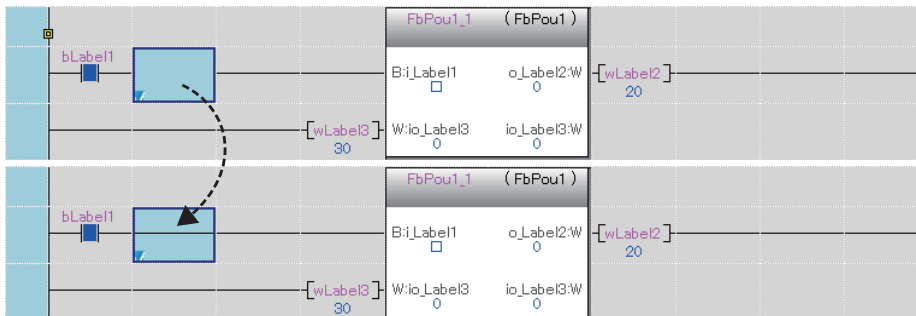
Ex.



The following shows the procedure for displaying the monitor value properly.

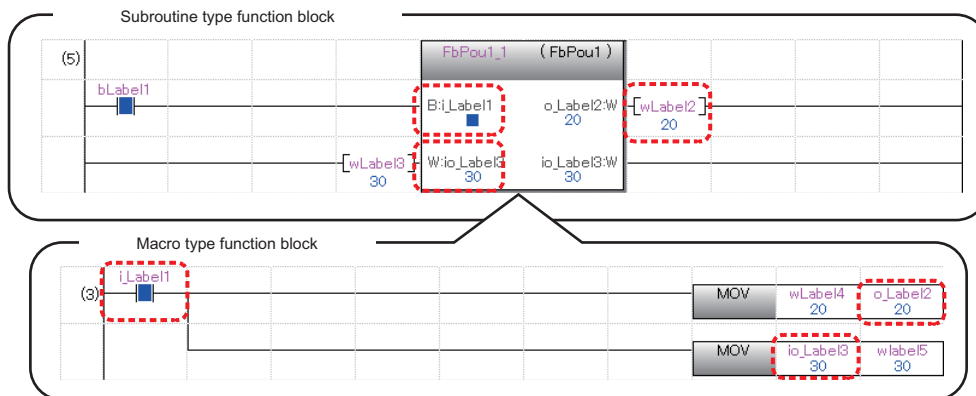
Operating procedure

1. Delete the line in the input circuit of the macro type function block.
2. Enter a line again.



3. Convert the program.

The monitor value of the input/output label of the macro type function block is displayed properly.



Considerations when monitoring file registers

To monitor file registers while "Use File Register of Each Program" is selected in "CPU Parameter" ⇒ "File Setting" ⇒ "File Register Setting" ⇒ "Use or Not Setting," select a program to be monitored with the specified program monitor function before starting monitoring.

For the operation method of the specified program monitor function, refer to the following:

☞ Page 633 When monitoring devices/labels in a specified program

■When not using the specified program monitor function

When monitoring file registers while "Use File Register of Each Program" is selected without using the specified program monitor function, the operation differs depending on the setting of "Specifying Method" in "Device/Label Access Service Processing Setting."

| Specifying method | Operation |
|---|--|
| Execute END Processing between Programs | <p>FFFFH (-1) will be monitored in the following cases since monitoring is performed between programs or at the END processing.</p> <ul style="list-style-type: none"> Monitoring is requested after a program which is set not to use file registers. The value of a file register with bigger file size is monitored after a program using a file register with smaller file size. |
| Others | <p>A file register file that is enabled in the program executed just before the END processing will be monitored.</p> <p>Example: When the execution order of the programs is 'A→B→C→(END processing)→A→B...', the value of the file register at the execution of program C will be monitored.</p> <p>Therefore, FFFFH (-1) will be monitored in the following cases:</p> <ul style="list-style-type: none"> The program just before the END processing is set not to use file registers. The value of a file register with bigger file size is monitored when a file register with smaller file size is used in a program just before the END processing. |

In the following cases, add a program that transfers monitoring target file registers to devices, then monitor the transferred program. Note that the number of steps and scan time will increase for the added program.

- Any of the programs is set not to use file registers.
- File register size differs.

If the file register for which "Use File Register of Each Program" is selected is used as data with no latch (such that the data is set to clear to '0' at the first time), replacing the file registers to local devices avoids increase of number of steps and scan time due to the addition of programs.

Considerations when monitoring labels

In the data types of instruction arguments (labels), some of them are represented as the genetic data types. In addition, the arguments such as ANY16 or ANY32 may have both attributes, "Signed" and "Unsigned."

The monitor value of the genetic data type is displayed as the specified label data type. Specify the data type according to the instruction specifications^{*1}.

^{*1} For details, refer to the following:

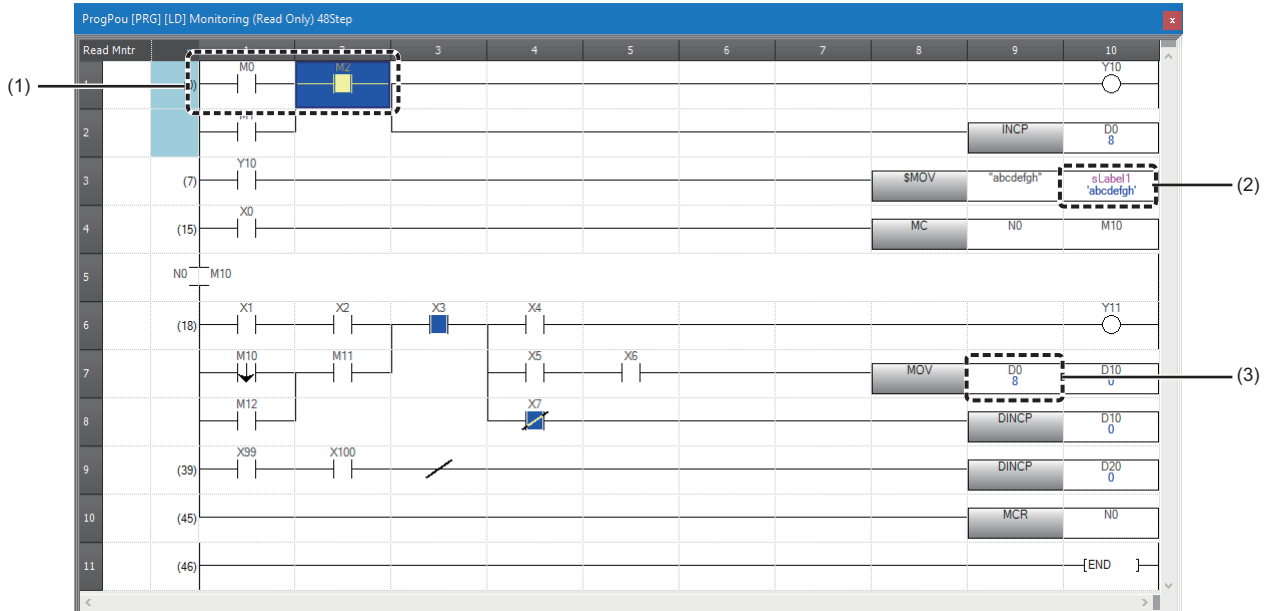
- ☞ MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)
- ☞ MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks)

Ladder

Circuit monitor

Operating procedure

Open a ladder editor, and select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ()/[Stop Monitoring] ().



- (1) ON/OFF status of a contact/coil
- (2) Monitor value of a string type label
- (3) Monitor value of a word device

Point

The color of monitor values or others can be changed.

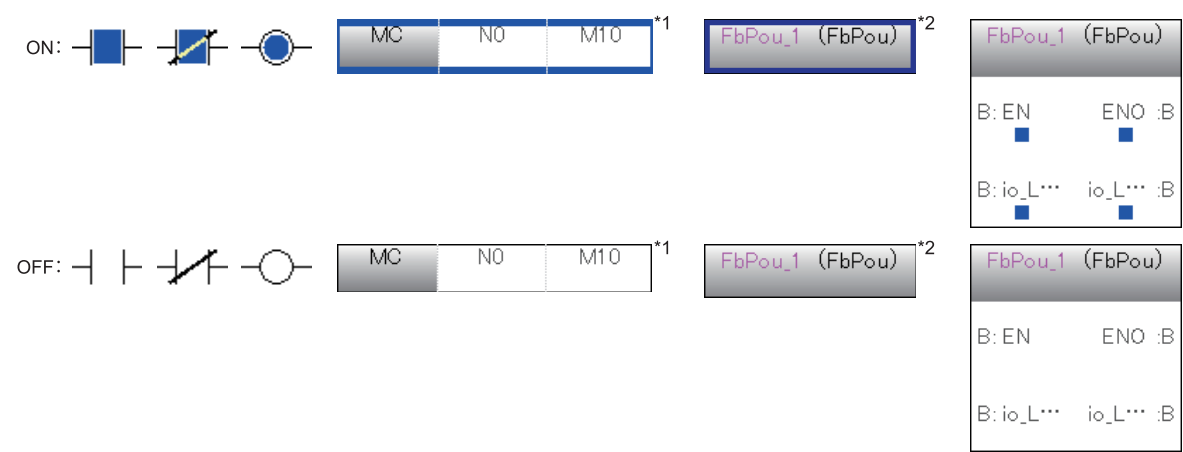
☞ Page 82 Checking and Changing Colors and Fonts

The number of characters for monitor values (strings) displayed in the monitor screen can be changed with the following option.

- [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Ladder Editor" ⇒ "Character String Monitoring Setting" ⇒ "Numbers of Characters to Display"

■ON/OFF state display

During monitoring, the ON/OFF state is displayed as shown in the following figure.



*1 Only the following comparison operation instructions that are equivalent to contacts and the instructions that are equivalent to coils are supported.
Comparison operation instructions equivalent to contacts: BIN16-bit data comparison, BIN32-bit data comparison, floating-point data comparison, 64-bit float data comparison
Instructions equivalent to coils: SET, RST, PLS, PLF, SFT, SFTP, MC, FF, DELTA, DELTAP, OUTHS, STL

*2 During monitoring, a function block with EN is displayed according to the ON/OFF state of EN. On the other hand, a function block without EN is always displayed as ON, and an undefined function block is always displayed as OFF.

Precautions

- If two application instructions (such as OUT or INCP instruction) are connected to one output label (bit type) of a function or subroutine type function block with EN/ENO, the value of the output label may not be applied to the device/label of the OUT instruction.
However, it can be avoided by any of the following operations:
 - Use a function or subroutine type function block without EN/ENO.
 - Use a macro type function block with EN/ENO.
 - Add ladders to transfer the value of the output label to another device/label and to transfer the value of the device/label to the two instructions.
- When a device or label of timer/retentive timer/counter type is specified for an instruction argument equivalent to a contact, it may not be displayed as ON if the data type is different between the device/label of the argument and N (current value).

Changing current values

Current values can be changed by the following methods during monitoring.

| Target device/label | Operating procedure |
|---------------------|--|
| Bit type | Select a cell of device/label, then press the Shift + Enter keys. |
| Word type | Register a device/label in a watch window and change the value. (Page 658 Checking Current Values by Registering Devices/Labels) |

ST

Depending on the data types of a device and a label, the locations where their monitor values are displayed differ.

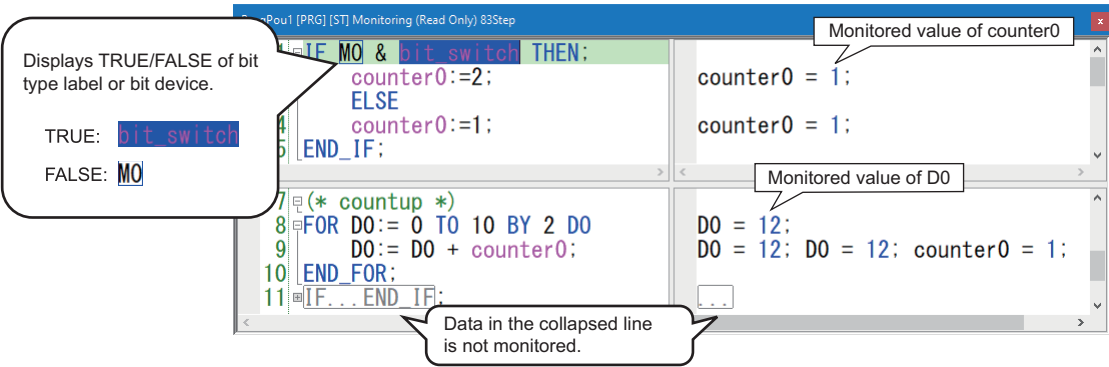
- Bit type: in a program
- Other than bit type: in the right half of the split window

A monitor value is displayed on the tooltip by placing the cursor on a device/label name.

Monitor

Operating procedure

Open an ST editor, and select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] (🟢)/[Stop Monitoring] (🔴).



Point

By using the following menu, the right half of the split window can be displayed or hidden.

- [Monitor] ⇒ [Switch ST Monitor Display (All)]/[Switch ST Monitor Display (Bit Type Only)]

The color of monitor values or others can be changed.

📖 Page 82 Checking and Changing Colors and Fonts

When an array type label or bit-specified label is selected, the monitor value of its array element or bit number is displayed on the tooltip.

Example: Even when 'iArray' of an array type label 'iArray[0]' is selected, the monitor value of 'iArray[0]' is displayed on the tooltip.

Changing current values



Current values can be changed by the following methods during monitoring.

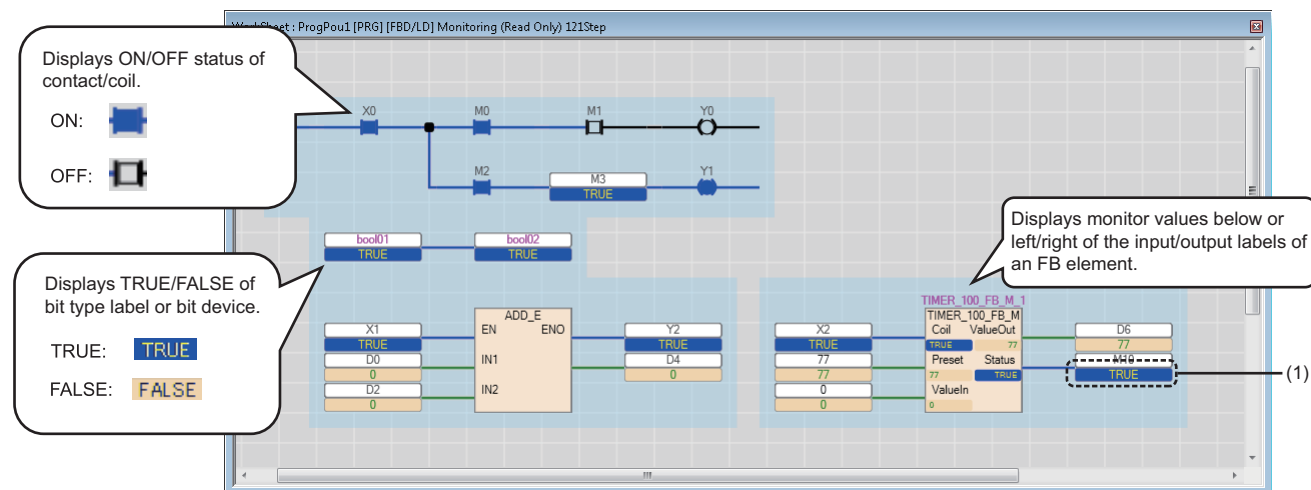
| Target device/label | Operating procedure |
|---------------------|--|
| Bit type | Select a token of device/label, then press the [Shift] + [Enter] keys. |
| Word type | Register a device/label in a watch window and change the value. (📖 Page 658 Checking Current Values by Registering Devices/Labels) |

FBD/LD

Monitor

Operating procedure

Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ()/[Stop Monitoring] ().



(1): Monitor value display area

When the current value cannot be monitored, "---" is displayed in the monitor value display area.

Point

The background, text, and other colors of monitor values can be changed.

➞ Page 82 Checking and Changing Colors and Fonts

Precautions

An inline structured text program cannot be monitored in the preview display area of inline structured text elements. Monitor it on an ST editor.

Display format

■Contact

The current continuity state can be checked by looking at a contact.

By setting the following option, ON/OFF of a constant can be changed with the current value of a device/label.

- [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "FBD/LD editor" ⇒ "Display Setting" ⇒ "Use Same Display Format for Contact as Device/Label Current Value"

■Word device

A word device is displayed in Word [Signed].

For a word device with a device type specifier, the word device is displayed in the data type indicated by the device type specifier.

For details on a device type specifier, refer to the following:

📖 MELSEC iQ-R Programming Manual (Program Design)

■Connection line

A connection line is displayed in different colors depending on the current monitor value.

Some colors for a connection line can be changed in the "Color and Font" screen. ( Page 82 Checking and Changing Colors and Fonts)

The following table shows the monitor values and colors for a connection line.

| Monitor value | Color for a connection line |
|-----------------|---|
| TRUE | Color set for "Power Flow(TRUE)" in the "Color and Font" screen (Default: blue) |
| FALSE | Color set for "Power Flow(FALSE)" in the "Color and Font" screen (Default: black) |
| Numerical value | Deep green |
| String | Black |
| Incorrect value | Gray |

When connecting the following elements, a connection line is displayed in gray.

| Input side | Output side |
|---|---|
| <ul style="list-style-type: none">• Contact (monitor value: incorrect value)• Coil (monitor value: incorrect value)• Function• Connector element• Variable element^{*1} | <ul style="list-style-type: none">• Contact• Coil• Function• Input label of a macro type function block element (bit type)• Connector element• Return element• Jump element• Variable element^{*1} |

*1 Only the variable elements satisfying any of the following conditions:

- The monitor value is an incorrect value.
- The monitor value does not exist.
- The monitor value is not displayed.
- Buffer memory or link memory is assigned, and also "No" is selected for the following option:


[Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "FBD/LD editor" ⇒ "Operational Setting" ⇒ "Monitor Buffer Memory and Link Memory"

Monitor value display area of variable elements

■Changing the position

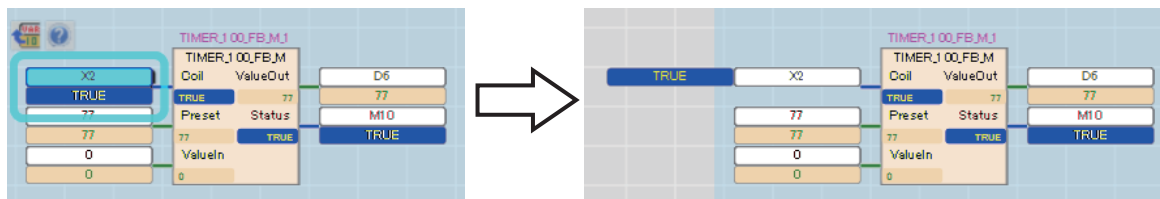
The following shows the procedure for changing the position of the monitor value display area of a variable element.

Operating procedure

1. Select a variable element.
2. Click the smart tag ().

Each time the smart tag is clicked, the monitor value display area moves to above, below, left, and right of the variable element.*1


The monitor value display area is displayed at the changed position until the project is closed.

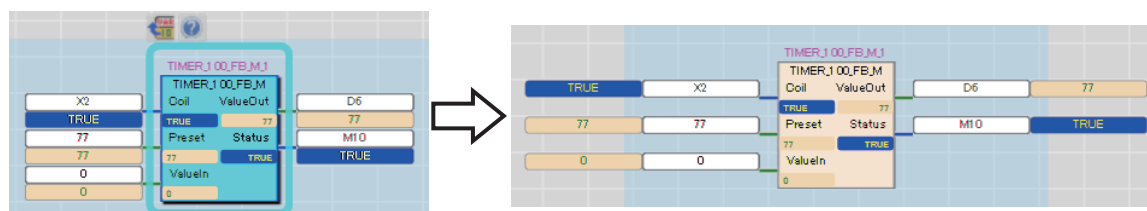


*1 If the height of a function block element or function element is of the compact type, the monitor value display area moves to above, below, left, and right of the variable element as well as on the element.

14

Point

The positions of the monitor value display areas of variable elements which are connected to a function block element or function element can be changed at once by clicking the smart tag of the element. ().

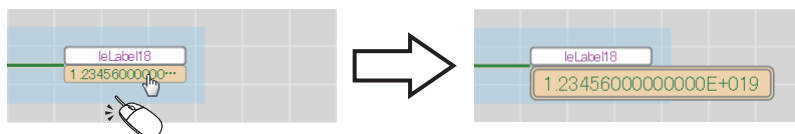


■Enlarging the display

The following shows the procedure for enlarging the monitor value display area of a variable element.

Operating procedure

Click the monitor value display area of a variable element.





The monitor value display area is enlarged until the project is closed.

To restore it, click the monitor value display area again.

Precautions




For GX Works3 Version 1.047Z or later, a part of a monitor value may be omitted and displayed.

In that case, all digits of the monitor value can be checked by any of the following operations.

- Register devices and labels in a watch window. ( Page 659 Registering to a watch window)
- Place the cursor on a device or label name. (The monitor value is displayed on the tooltip.)
- Enlarge the monitor value display area. ( Page 645 Enlarging the display)

Changing current values

Current values can be changed by the following methods during monitoring.

| Target device/label | Operating procedure |
|---------------------|--|
| Bit type | Select an element of a device/label, then press the  +  keys. |
| Word type | Register a device/label in a watch window and change the value. ( Page 658 Checking Current Values by Registering Devices/Labels) |



SFC

Monitor values of a device and a label of the SFC program that the execution type of the program is set for "Scan."
SFC program has the monitoring functions shown below.

| Purpose | Target editor/function name | Reference |
|--|------------------------------|--|
| To check the active status of steps and current values of devices on an SFC diagram. | SFC diagram monitor | Page 647 Monitoring an SFC diagram |
| | SFC auto-scroll | Page 650 Monitoring with the SFC auto-scroll |
| To check the steps which were activated on an SFC diagram. | SFC activated step monitor | Page 651 Monitoring SFC steps which were activated |
| To check the current values of devices in a Zoom. | Zoom monitor | Page 650 Monitoring a Zoom |
| To check block information in a list. | SFC block list monitor | Page 652 Monitoring the SFC block list |
| To check active status of all blocks in a list. | SFC all blocks batch monitor | Page 653 Monitoring all SFC blocks in batch/active steps |
| To check active status of steps in a specified block in a list. | Active step monitor | |


Monitoring an SFC diagram

Operating procedure

Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ()/[Stop Monitoring] ().

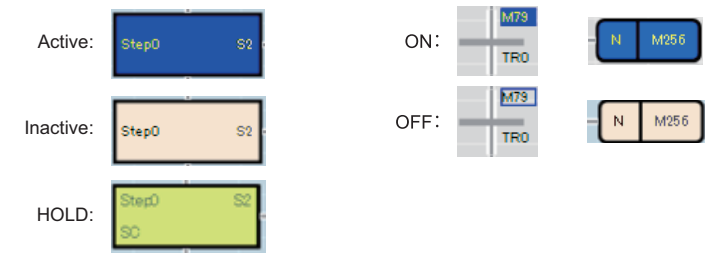



The background, text, and other colors of monitor values can be changed.

 Page 82 Checking and Changing Colors and Fonts

Detailed expression

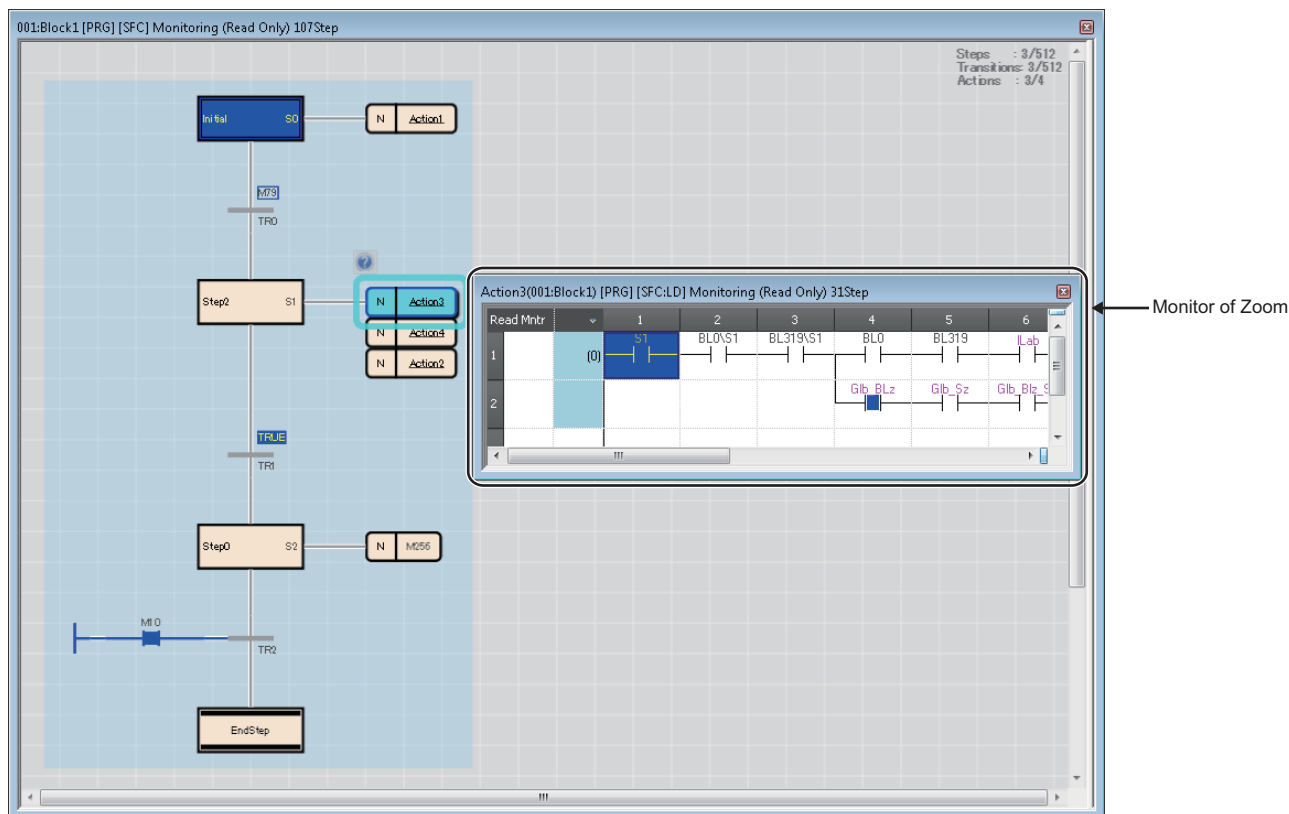
The status of an SFC element during monitoring is displayed as shown in the following figure.



The FBD/LD elements are displayed in the same manner as that on an FBD/LD editor.( Page 643 FBD/LD)

Ex.

The following screen is an example when selecting "Detailed Expression" in "Switch Ladder Display."



■MELSAP-L (instruction format)

For a monitor value of the bit type expressed in MELSAP-L (instruction format), the continuity state is highlighted on an SFC diagram as shown in the following table:

| Instruction | Display example when monitoring |
|---|---|
| Coil output, set output | aY70 , sM100 |
| Reset output | rM200 |
| At the time of output of a timer/high-speed timer At the time of output of a counter | bTC K100 , bCC K200 , hTC K100 |
| At the time when a timer/high-speed timer is up At the time when the value of a counter is counted up to the specified value | bT0 K100 , bC0 K200 , hT0 K100 |
| Open contact/close contact | aX0 , hM2 |
| Rising contact/falling contact | pM300 , fM400 |
| Comparison operation instruction equivalent to a contact ^{*1} | < D1 D100 |
| Bit device in an application instruction ^{*2} | ENC.OP M0 D8 K3 |

*1 A character string comparison instruction is not highlighted.

*2 A digit-specified bit device is not highlighted.

A monitor value of a label other than the bit type and a word device is displayed on the right side of the split window.

The following table shows the monitoring availability depending on the data type of a device and a label.

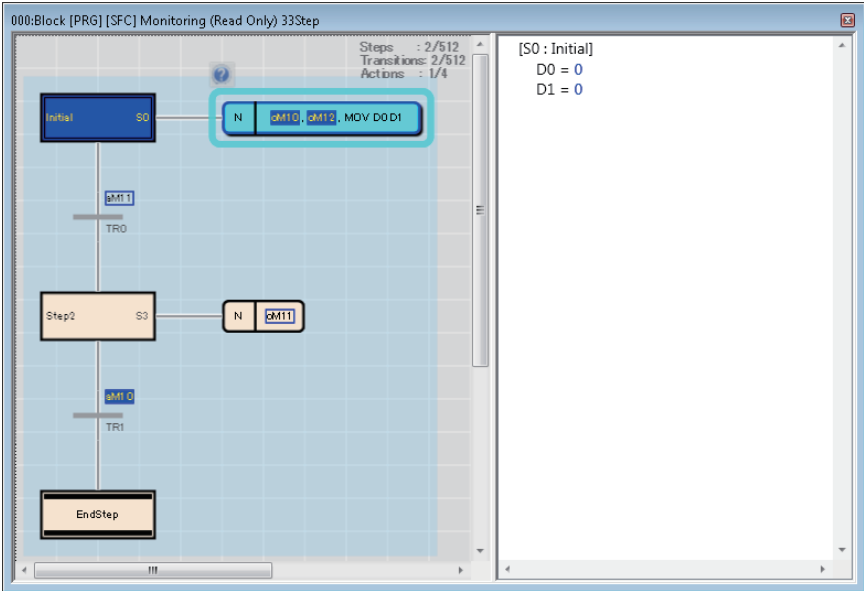
○: Monitored, ×: Not monitored, —: Not applicable

| Data type ^{*1} | Variable | | Constant | |
|--|----------|---------------------|----------|-------|
| | Device | Label ^{*2} | Device | Label |
| Bit | × | × | × | × |
| Word [Unsigned]/Bit String [16-bit] | ○ | ○ | × | ○ |
| Double Word [Unsigned]/Bit String [32-bit] | ○ | ○ | × | ○ |
| Word [Signed] | ○ | ○ | × | ○ |
| Double Word [Signed] | ○ | ○ | × | ○ |
| FLOAT [Single Precision] | ○ | ○ | × | ○ |
| FLOAT [Double Precision] | ○ | ○ | × | ○ |
| Time | — | × | × | × |
| String | — | ○ | × | ○ |
| Pointer | × | × | — | — |
| Timer ^{*3} | ○ | ○ | — | — |
| Retentive timer ^{*3} | ○ | ○ | — | — |
| Counter ^{*3} | ○ | ○ | — | — |
| Long timer ^{*3} | ○ | ○ | — | — |
| Long retentive timer ^{*3} | ○ | ○ | — | — |
| Long counter ^{*3} | ○ | ○ | — | — |

- *1 An instruction other than a comparison operation instruction that is equivalent to a contact is monitored with a device type specifier added according to the data type of an argument.
Devices used for a comparison operation instruction are monitored with a device type specifier added according to each instruction.
A label used for a comparison operation instruction is monitored in the data type defined in a label editor.
- *2 When a value other than a fixed value is used for an array index, the monitor value is not displayed in the editor, or displayed as an indefinite value.
- *3 The current value (N) is displayed. When using it as a contact for a transition, the contact (S) is monitored, not the current value (N).

Ex.

The following screen is an example when selecting "MELSAP-L (Instruction Format)" in "Switch Ladder Display."



■Monitoring a Zoom

Select [View] ⇒ [Open Zoom/Start Destination Block], then open the Zoom to monitor.

The methods for operating/displaying a monitor of Zoom are the same as that of each program editor.

Devices, which can be monitored, are the same as those for each program editor except for special relays (S). Special relays (S)*1 can be monitored only in a Zoom.

*1 For RCPUs, the devices may not be monitored properly when a target block is switched by the BRSET instruction.

Precautions

When monitoring is performed in a scan where a transition is satisfied, a step that was being executed (transition source step) is displayed in inactive state, and the next step connected to a transition (transition destination step) is displayed in active state.

Note that when continuous transition is not set, the transition destination step is executed in the next scan. Therefore, when monitoring the transition destination step and operation output at the same time, the step will be activated, however, the monitor value of the operation output will not be changed.

Monitoring with the SFC auto-scroll

After starting monitoring of an SFC diagram, select [Online] ⇒ [Monitor] ⇒ [SFC Auto-scroll] ().

When a step, which is not displayed on the screen, is activated during monitoring, the screen automatically scrolls to show it.

When multiple steps are activated, the step closer to the row of the initial step will be displayed preferentially.

During monitoring with the SFC auto-scroll, the automatic synchronization of the cross reference function and the automatic registration to a watch window cannot be performed.

■Displaying a start destination block during monitoring with the Auto-scroll

When an active step moves to a block start step during monitoring with the auto-scroll, an SFC diagram editor of the start destination block opens automatically and monitoring starts.

Whether to open a start destination block automatically can be set by setting the following option.

- [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "SFC Diagram Editor" ⇒ "Auto-scroll Monitor Setting" ⇒ "Monitor the Block Start in a New Window"

■Displaying a Zoom during monitoring with the Auto-scroll

When a Zoom is opened during monitoring with the auto-scroll, the display contents in the Zoom switch automatically according to the display of an active step.

Precautions

When the update rate of the active status of a step is higher than the monitoring cycle, the status may not be acquired depending on the timing of monitoring.

In such a case, the step is not displayed by this function.

Monitoring SFC steps which were activated

While monitoring an SFC program, steps which were activated in the period from the start to the end of a block can be displayed in the specified color.

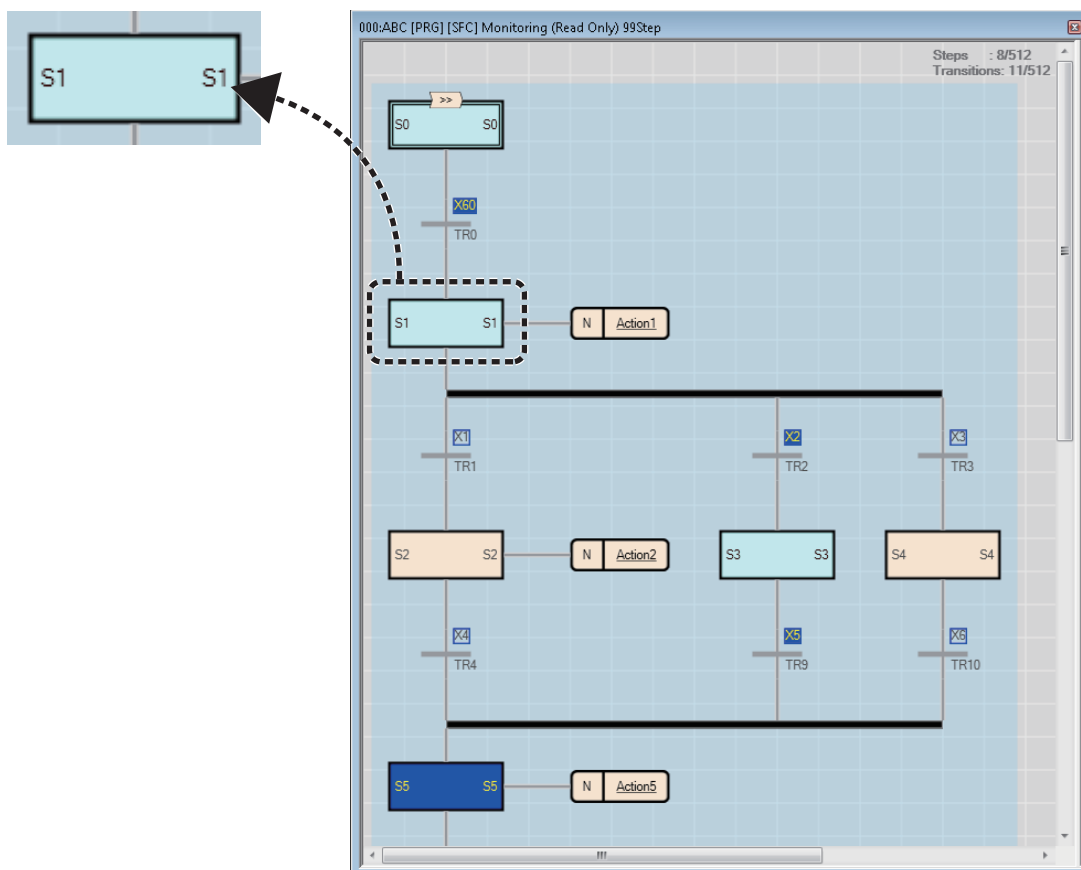
This makes it possible to easily identify the route on which a program was executed.

By selecting [Online] ⇒ [Monitor] ⇒ [SFC Activated Step Monitor], steps which were activated can be displayed in the specified color.

RnPCPUs and RnPSFCPUs do not support this function.

■Displaying steps which were activated

During a monitoring, steps which were activated are displayed as follows:



Precautions

When displaying and monitoring steps which were activated, the monitoring cycle will be longer.

If any of the following operations is performed, steps which were activated will return to the state before being activated.

- Turning the power of a CPU module OFF
- Resetting a CPU module
- Stopping an SFC program using SM321
- Stopping an SFC program using a POFF instruction

Changing the active status

The active status of blocks/steps can be changed by the following methods during monitoring.

It can be used to check the operation by starting/stopping particular blocks/steps only.

| Target | Operation screen | Operation |
|--------|---|--|
| Block | Each program editor (including a Zoom) | Change the current value (TRUE/FALSE) of an SFC block device (BL). ^{*1} |
| | "Device/Buffer Memory Batch Monitor" window | |
| | Watch window | |
| Step | SFC diagram editor | Select a step, then select [Debug] ⇒ [Control SFC Steps] ⇒ [Activate the Selected Steps]/[Deactivate the Selected Steps]/[Activate the Selected Steps Only]. |
| | Zoom | Change the current value (TRUE/FALSE) of a step relay (S) or step relay with block specification (BL□\S). ^{*1} |
| | Each program editor (excluding a Zoom) | Change the current value (TRUE/FALSE) of a step relay with block specification (BL□\S). ^{*1} |
| | "Device/Buffer Memory Batch Monitor" window | |
| | Watch window | |

^{*1} A block/step can be activated by changing the current value of a label to which a step relay with block specification (BL□\S) or SFC block device (BL).

Precautions

- Note that changing the active status of a block or step will affect the operation of a CPU module.
- If the current value of a block is changed during the online program change for an SFC block, the active status of the block cannot be changed.

Changing current values (device/label)

Current values of the following devices/labels can be changed on an SFC diagram during monitoring. Select a device/label and press the **[Shift]** + **[Enter]** keys.

- Bit devices/bit type labels of transitions/actions on an SFC diagram editor
- Bit devices/bit type labels of FBD/LD elements connected to transition

The methods for changing current values of devices/labels in a Zoom is the same as that of each program editor.

For step relays (S), step relays with block specification (BL□\S), and SFC block devices (BL), refer to the following:

☞ Page 652 Changing the active status

Monitoring the SFC block list

Display current block information on an SFC block list.

Select [View] ⇒ [Open SFC Block List], then open an SFC block list to monitor.

| No. | Data Name | Title | Conversion Status | Block START/END | Step Transition | Block PAUSE/RE | Block Stop Mode | Continuous Transi | Number of Active | Comment |
|-----|-----------|----------------|-------------------|-----------------|-----------------|----------------|-----------------|-------------------|------------------|----------------|
| 0 | Block0 | FirstProcess | — | M0 | M1 | M2 | M3 | M4 | 1 | Block Comment |
| | | | | M0 Comment | M1 Comment | M2 Comment | M3 Comment | M4 Comment | D0 Comment | |
| 1 | Block1 | Second Process | — | M1 0 | M1 1 | M1 2 | M1 3 | M1 4 | 0 | Block1 Comment |
| | | | | M1 0 Comment | M1 1 Comment | M1 2 Comment | M1 3 Comment | M1 4 Comment | Label comment | |
| 2 | | | | | | | | | | |



The SFC diagram of specified block can be displayed by double-clicking the block column during monitoring.

Monitoring all SFC blocks in batch/active steps

Active status of all blocks/steps can be displayed.

Active status of /blocks/steps are not changed if the status of a CPU module is switched from RUN to STOP. Thereby, the active status when the CPU module was changed to STOP state is displayed on a monitor screen.

Precautions

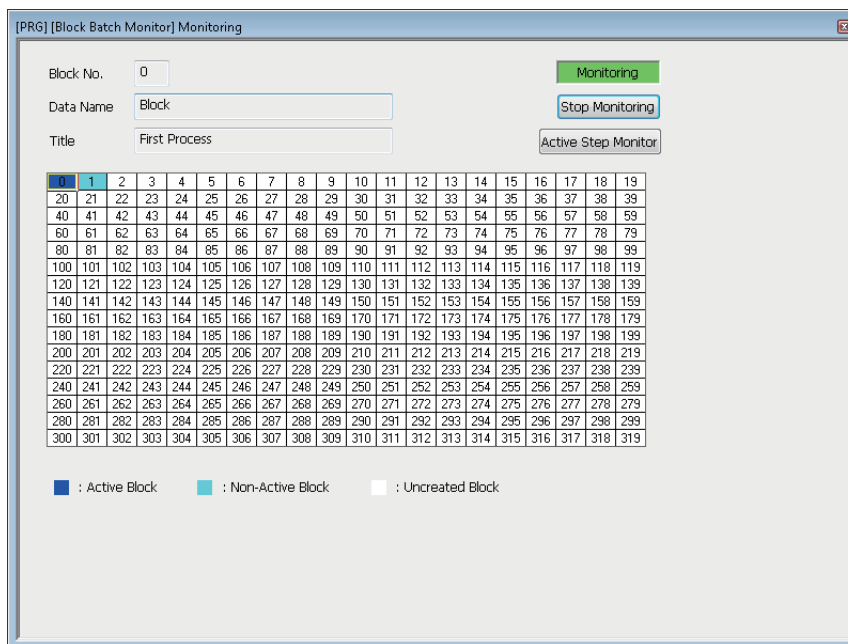
This monitoring function may not work properly when there is a difference between the program written in a CPU module and program in a project.

■Monitoring SFC blocks in batch

Display current active/inactive status of all blocks in a list.

Window

Select [Online] ⇒ [Monitor] ⇒ [SFC All Blocks Batch Monitoring] ().



■Monitoring active steps

Display current active/inactive status of all steps that exist in a specified block in a list.

Up to five monitor screens can be displayed at once.


Operating procedure

Move the cursor on a block to be monitored in the "Block Batch Monitor" screen, then click the [Active Step Monitor] button.

14.3 Checking Device/Buffer Memory in a Batch

Use the device/buffer memory batch monitor function to check the devices and buffer memory in a batch.
If multiple monitoring screens are open, lead time to start monitoring and monitoring intervals may become longer.
Multiple CPU shared memory (buffer memory) of multiple CPU system can be monitored only by the device/buffer memory batch monitor function.

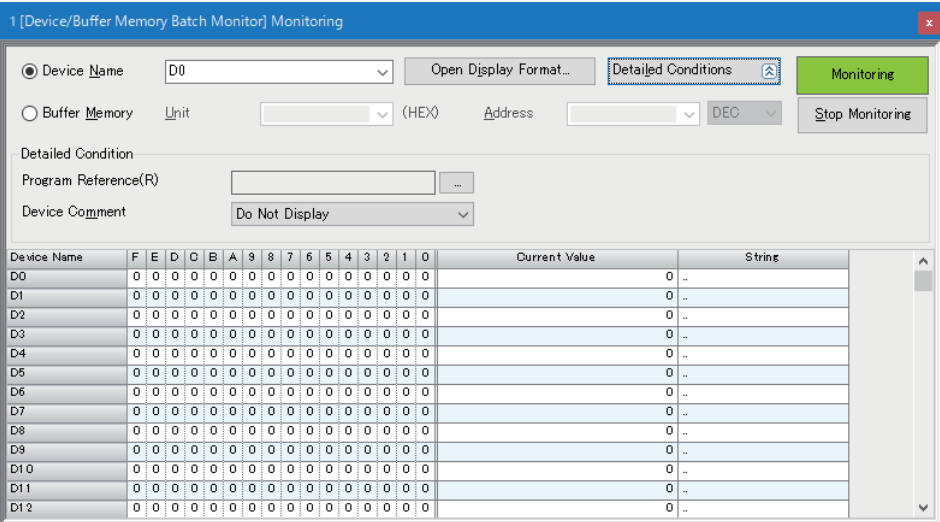
Window


Select [Online] ⇒ [Monitor] ⇒ [Device/Buffer Memory Batch Monitor] ().

■Toolbar



■"Device/Buffer Memory Batch Monitor" window




Up to 64 monitoring screens can be displayed at once. The numbers are displayed at the start of the screen title.
The display format in the "Device/Buffer Memory Batch Monitor" window can be set in the same manner as in a device memory editor. Refer to the following:
 Page 449 Setting the display format

Operating procedure

■Monitoring devices in a batch

Enter the device (start number) to be monitored in "Device Name."

For the devices that can be entered, refer to the following:

 Page 929 Applicable Devices in GX Works3

- When the target device is local device: Specify "Program Reference."
- When checking the TC setting values: Enter a device of timer, retentive timer, long timer, long retentive timer, counter, or long counter (Example: T10, ST10, LT10, LST10, C10, LC10) and specify "Program Reference."

■Monitoring buffer memory in a batch

Enter a start I/O number, intelligent module number, and address of an intelligent function module.

| Item | Description |
|-----------------------------|--|
| Unit/Intelligent Module No. | <p>■RCPU and LHCPU: "Start I/O No." is shown. Enter the start I/O number of the intelligent function module to be monitored in hexadecimal format.</p> <ul style="list-style-type: none"> For multiple CPU configuration Specify the CPU module to be monitored. CPU No.1: 3E00, CPU No.2: 3E10, CPU No.3: 3E20, CPU No.4: 3E30 <p>■FX5CPU: "Intelligent Module No." is shown. Enter the intelligent module number of an intelligent function module to be monitored in hexadecimal format.</p> |
| Address | Enter the address of buffer memory to be monitored in decimal/hexadecimal format. |

■Monitoring blocks/steps in an SFC program in batch

Enter SFC block devices (BL) in "Device Name" when monitoring blocks, and enter step relays with block specification (BL□\S) there when monitoring steps.



Fonts can be changed.

☞ Page 82 Checking and Changing Colors and Fonts

Applicable monitoring devices

The following table shows the devices that can be monitored in the "Device/Buffer Memory Batch Monitor" window.
For the available devices in a CPU module, refer to the user's manual of each module.


| Module type | Device |
|--------------------|--|
| RCPU LHCPU | X, Y, M, L, B, F, SB, V, T, T(TS), T(TC), T(TN), ST, ST(STS), ST(STC), ST(STN), LT, LT(LTS), LT(LTC), LT(LTN), LST, LST(LSTS), LST(LSTC), LST(LSTN), C, C(CS), C(CC), C(CN), LC, LC(LCS), LC(LCC), LC(LCN), D, W, SW, FX, FY, SM, SD, FD*1, J□\X, J□\Y, J□\B, J□\SB, J□\W, J□\SW, U□\G, U□\HG, DX, DY, Z, LZ, R, ZR, RD, BL, BL□\S, SAIM, SAIM, SAIX, SA\Y, SA\B, SA\D, SA\SD, SA\W, SA\T(TC), SA\T(TS), SA\T(TN), SA\T, SA\C(CC), SA\C(CS), SA\C(CN), SA\C, SA\ST(STC), SA\ST(STS), SA\ST(STN), SA\ST |
| FX5CPU | X, Y, M, L, B, F, SB, S, T, T(TS), T(TC), T(TN), ST, ST(STS/SS), ST(STC/SC), ST(STN/SN), C, C(CS), C(CC), C(CN), LC, LC(LCS), LC(LCC), LC(LCN), D, W, SW, SM, SD, U□\G, Z, LZ, R, BL, BL□\S |
| Remote head module | X, Y, SB, W, SW, SM, SD, U□\G, DX, DY, RD |

*1 To display the current value of an FD device, either of the following needs to be selected in the "Display Format" screen:

- 64-bit Integer [Signed]
- 64-bit Integer [Unsigned]

Changing current values

During monitoring, current values can be changed by one of the following operation.


- Double-click a cell of a device.
- Press the  key.
- Right-click a cell of a device or the "Current Value" column, and select [Modify Value] from the shortcut menu.

■For bit devices

The current value is changed.




■For word devices

A device is registered in a watch window.

Change the current value in the watch window. ( Page 658 Checking Current Values by Registering Devices/Labels)

Multiple word devices can be registered in a watch window at once by selecting multiple cells of the current values.

Precautions

- For a timer (T) and counter (C), the contacts and current values can be changed in an RCP; however, only the contacts can be changed in an FX5CPU.
- When "Bit and Word" is selected in "Display Unit Format" of  (Display Format Detailed Setting), the current value of the following devices can be changed by changing the bit status in the 0 to F column:
 - Direct access input (DX)
 - Direct access output (DY)
 - Function input (FX)
 - Function output (FY)
 - Link input (J□\X)
 - Link output (J□\Y)
 - Link relay (J□\B)
 - Link special relay (J□\SB)
- When "Bit and Word" is selected in "Display Unit Format" of  (Display Format Detailed Setting), the current value of an index register (Z) cannot be changed even if the bit status in the 0 to F column is changed.
- For a step relay (S), step relay with block specification (BL□\S), and SFC block device (BL), the blocks/steps are activated/deactivated by changing the current values. ( Page 652 Changing the active status)
- When a program is selected with the specified program monitoring function, the function is disabled by selecting "No" for the following option during monitoring:
 - [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Common Item" ⇒ "Timing to Execute Monitor Function and Modify Value Function" ⇒ "After the execution of specified program"

Considerations when monitoring file registers

To monitor file registers while "Use File Register of Each Program" is selected in "CPU Parameter" ⇒ "File Setting" ⇒ "File Register Setting" ⇒ "Use or Not Setting," select a program to be monitored with the specified program monitor function before starting monitoring.

If any of the programs is set not to use file registers or the file register size differs, device/buffer memory batch monitoring may not be started.

For the operation method of the specified program monitor function, refer to the following:

 Page 633 When monitoring devices/labels in a specified program

■When not using the specified program monitor function

When monitoring file registers while "Use File Register of Each Program" is selected without using the specified program monitor function, the operation differs depending on the setting of "Specifying Method" in "Device/Label Access Service Processing Setting."

| Specifying method | Operation |
|---|---|
| Execute END Processing between Programs | <p>Devices may be out of range in the following cases and thus device/buffer memory batch monitoring may not be started since monitoring is performed between programs or at the END processing.</p> <ul style="list-style-type: none"> Monitoring is attempted after a program which is set not to use file registers. The range of file registers with bigger file size is monitored after a program using a file register with smaller file size. |
| Others | <p>A file register file that is enabled in the program executed just before the END processing will be monitored. Example: When the execution order of the programs is 'A→B→C→(END processing)→A→B...', the value of the file register at the execution of program C will be monitored.</p> <p>Therefore, device/buffer memory batch monitoring cannot be started in the following cases:</p> <ul style="list-style-type: none"> The program just before the END processing is set not to use file registers. The range of file registers with bigger file size is monitored when a file register with smaller file size is used in a program just before the END processing. |

In the following cases, use the watch function. Alternatively, add a program that transfers monitoring target file registers to devices, then monitor the transferred program.

- Any of the programs is set not to use file registers.
- File register size differs.

Note that the number of steps and scan time will increase for the added program.

If the file register for which "Use File Register of Each Program" is selected is used as data with no latch (such that the data is set to clear to '0' at the first time), replacing the file registers to local devices avoids increase of number of steps and scan time due to the addition of programs.

Specifying reference target of program

Specify the monitoring target program when monitoring the setting values of timer devices and counter devices, or local devices.

Operating procedure

- Click the [Detailed Conditions] button, then click the [...] button of "Program Reference" in the "Device/Buffer Memory Batch Monitor" window.
- Set each item in the "Program Reference" screen, and click the [OK] button.

14.4 Checking Current Values by Registering Devices/Labels

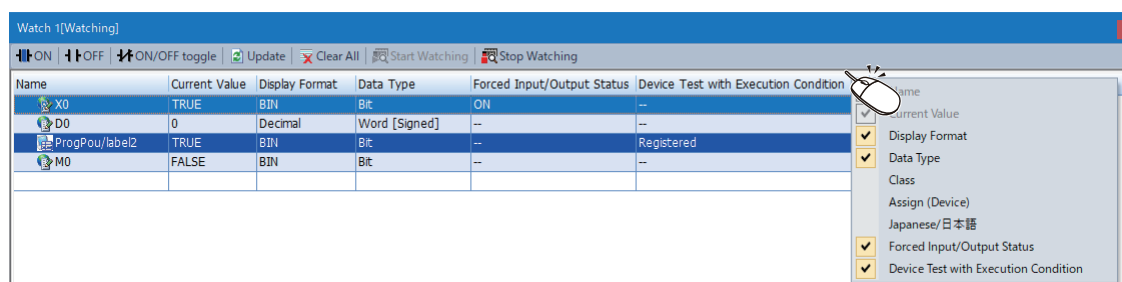
To check the current values by registering devices or labels, use the watch function. Registering devices or labels to be checked in a watch window is required.

By specifying a range, multiple devices or labels can be registered at once.

Once devices/labels are registered and the project is saved, the registered devices/labels are displayed in the registered state when the project is opened again.

Window

Select [View] ⇒ [Docking Window] ⇒ [Watch 1] to [Watch 4] (Dev).



The display format can be selected per row from the pull-down list displayed when selecting the display format.

Operating procedure

1. Register devices/labels to be monitored. (Page 659 Registering to a watch window)
2. Select [Online] ⇒ [Watch] ⇒ [Start Watching].

During monitoring, "[Watching]" is added in the title of the watch window.

Point

When selecting a program with the specified program monitor function, the value after the selected program was executed is displayed as the current value. In this case, "[Watching (Running Specified Program Monitor)]" is added to the title of a watch window.

For details on the specified program monitor function, refer to the following:

Page 633 When monitoring devices/labels in a specified program

■Displaying a constant

For a label of "VAR_GLOBAL_CONSTANT" or "VAR_CONSTANT" class, the constant set to the label is displayed as the current value when starting watching.

Operating a watch window

■Updating the display

If data is changed by editing or converting ^{*1} program, the change will not be applied to a watch window.

After changing data, update the display of a watch window by clicking . ^{*2}

^{*1} Example: A comment is edited in a label editor.

^{*2} Label names, program names, and POU names are not updated. To update these items, register them in the watch window again.

■Other operations

The following operations can be performed from the shortcut menu.

| Operation | Shortcut menu |
|--|--|
| Changing a title | Change Title |
| Switching the display format for the current value of a bit device (TRUE/FALSE↔ON/OFF) | ON/OFF Display |
| Editing a comment | Comment Edit |
| Changing the display format for a device and label ^{*1} | Change the Display Format of the Selected Device/Label |
| Changing the data type of a device ^{*2} | Change the Data Type of the Selected Device |

^{*1} The display format of a device or a label for which '-' is displayed in the "Display Format" column cannot be changed.

^{*2} Timer devices and counter devices are the only bit type devices whose data type can be changed.

Operating procedure


1. Select a row in a watch window, then right-click it.
2. Select the shortcut menu according to the operation to be performed.

Registering to a watch window

Register devices/labels to be monitored in the watch window.

Operating procedure

■Registering devices/labels by entering them manually

1. Open a watch window.
2. Enter a device/label to be registered in the "Name" column, and press the  key.

The input format of devices/labels are as follows:

- Global device: Device name
- Local device: Program name/#Device name ('#' is not necessary for index register (Z))
- Global label: Label name
- Local label: Program block name/label name
- Step relay: Step relay with block specification (BL□\S)

For structures, function blocks, and arrays, enter the items by referring to the following table.



| Type | Target | Input format |
|-----------------|--|---|
| Structure | Label (Structure) | Label name |
| | Structure member | Label name.member name |
| Function block | Label (Function block) | Label name |
| | Label in the function block | Label name.Label name in the function block |
| Array | Label (Array) | Label name excluding array notation |
| | Array index and the specific dimension part of array (more than two-dimensional array) | Label name[three-dimensional index] [two-dimensional index] [one-dimensional index] |
| Structure array | Label (Structure array) | Label name |
| | Specific member | Label name[three-dimensional index] [two-dimensional index] [one-dimensional index].member name |

| Type | Target | Input format |
|-----------------------|--|--|
| Nested function block | Label (Nested function block) | Label name |
| | Labels in the nested function block | Label name. label name in the function block. label name in the nested function block When nesting labels for one or more level deeper, the lower part of the label name which are delimited by a dot '.' is regarded as a label name. (Example: MAIN_PRG_LD/FB0_1.FB1_1.FB2_1.INOUT) |
| | When a function block includes array labels or structured labels | Follow the specification method of the array or structure. |

Point

When entering a label name, options will be displayed.

They can also be displayed by any of the following operations.

- Enter '/' after entering a program block name.
- Enter '.' at the end of a label name of structure type or an instance name of a function block.
- Press the  +  keys.

In addition, by selecting "Yes" for the following option, when entering a common device comment or a label comment, devices and labels for which the comment has been set can be displayed as options.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"


When comments have been set in the following device comments, those local devices are displayed as options by entering '/' at the end of a program file name.

- Common device comment
- Each program device comment with the same name as the program file name

■Registering devices/labels from program editor/label editor

1. In a program editor or a label editor, select a device or label to register in the watch window.
2. Select [Online] ⇒ [Watch] ⇒ [Register to Watch Window] ⇒ [Watch 1] to [Watch 4].

A device/label can also be registered by dragging and dropping it onto a watch window.

| Editor | Operating procedure |
|---------------------------------|---|
| Ladder editor ^{*1*2} | Select a cell of device/label, and then drag the border of the selected cell and drop it onto a watch window. |
| ST editor ^{*1*2} | Select a token of a device/label, and then drag and drop it onto a watch window. |
| FBD/LD editor ^{*1*2*3} | Select an element of a device/label, and then drag and drop it onto a watch window with pressing the  key. |
| SFC diagram editor | Select a step or a transition/action for which a device/label is set, and then drag and drop it onto a watch window. |
| Label editor | Select the header of a label, and then drag and drop it onto the watch window |


*1 For RCPUs and LHCPUs, step relays (S) used in programs other than a Zoom cannot be registered.

Step relays (S) are registered as step relays with block specification (BL□\S□) automatically in a Zoom.

*2 For FX5CPUs, step relays (S) used in a Zoom are registered as step relays with block specification (BL□\S) automatically.

*3 Devices/labels cannot be registered from the preview display area of inline structured text elements.

Point

- When rectangular selection is made on an ST editor, only the devices/labels in the selected range can be registered.
- When registering a label for which a value other than a fixed value is used as an array index, if a device/label that can be monitored is used as an array index, the index can be extracted and registered as another watch item. ( Page 662 Registering an array index)
- When the following menu is selected while a program editor is active, all devices/labels used in the program can be registered in a batch.
[Online] ⇒ [Watch] ⇒ [Batch Register to Watch Window] ⇒ [(Watch Window 1 to 4 (Batch Register))]

■Registering devices/labels from the "Label Comment" window

1. Select a label name to be registered in a watch window in the "Label Comment" window.
2. Drag and drop it onto the watch window.

The label is registered in the watch window.

■Registering devices/labels from a cross reference window

1. Select a row in a cross reference window.
2. Right-click it and select any of [Register to Watch 1] to [Register to Watch 4] from the shortcut menu.

The device/label is registered in the watch window.

■Registering devices/labels from the "FB Property" window

1. Select a row in the "FB Property" window.
2. Right-click it and select any of [Register to Watch 1] to [Register to Watch 4] from the shortcut menu.

The label is registered in the watch window.

■Registering devices/labels from the event history (offline monitor) window

1. Select a modify value event in the event history (offline monitor) window.
2. Right-click it and select [Register to Watch Window] ⇒ any of [Watch 1] to [Watch 4] from the shortcut menu.

The device/label is registered in the watch window.

■Registering an array index

The following shows the procedure for registering an array index in a watch window.

1. Check that a program is converted.
2. Select a label to be registered in a watch window in the program editor.
3. Select [Online] ⇒ [Watch] ⇒ [Register to Watch Window] ⇒ [(watch window 1 to 4)].

■Registering devices/labels again

The following shows the procedure for registering a device/label that is already registered in a watch window to a different watch window.

1. Select a row in a watch window.
2. Right-click it and select [Register to Watch Window again] ⇒ [(watch window 1 to 4)] from the shortcut menu.

Precautions

■Inapplicable labels

- When a value other than fixed value is used for an array index, the monitor value is not displayed or displayed as an indefinite value in a watch window.
- The monitor values of a local label used in a function are not displayed, or displayed as indefinite values in a watch window.

■Device test with execution conditions

When the ranges overlaps between a device whose the value was changed by the device test function with execution conditions and a device which was registered in a watch window, "Registered" is displayed in the "Device Test with Execution Condition" column of the watch window.

Ex.

When the double word [signed] type 'D0' is set in the "Register Device Test with Execution Condition" screen, the word (signed) type 'D1' is also registered in a watch window.

Automatic registration to watch windows

Devices and labels in a selected range in a program editor are automatically registered in a watch window.

Devices and labels in a watch window are updated every time when the specific range is changed.

The following table shows the range of automatic registration for each programming language.

| Programming language | Range | Remarks |
|---------------------------------|--|---|
| Ladder | Device/label on a ladder block containing the selected cell | A device/label in an FB and an inline structured text program is excluded. |
| Ladder (Inline structured text) | Device/label in a selected row with the inline structured text program selected | It follows the option settings for a ladder editor. |
| ST | Device/label on which the cursor is placed | When multiple rows are selected, only a device/label in the row on which the cursor is placed is registered. A device/label of an inline structured text program used in an FBD/LD program is also registered. |
| FBD/LD | Device/label in an FBD network block containing the element on which the cursor is placed | When multiple FBD network blocks are selected, only the device/label in the block containing the element on which the cursor is placed is registered. A device/label displayed in the preview display area of inline structured text elements is excluded. |
| SFC | Device, label, and FBD element contained in the element on which the cursor is placed (including a device/label in a Zoom) | — |

Operating procedure

1. Set the following option.

Select one of [Watch 1] to [Watch 4] in [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Ladder Editor"/"ST Editor"/"FBD/LD Editor"/"SFC Diagram Editor" ⇒ "Setting for Automatic Registration to Watch Window" ⇒ "Set Automatic Registration Destination."

2. During monitoring, select a range of devices/labels to be registered to a watch window in a program editor.

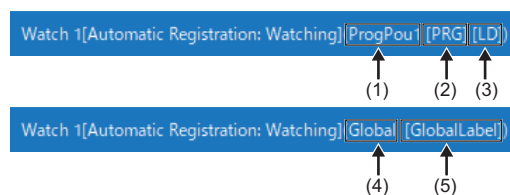
Point

For a label for which a value other than a fixed value is used as an array index, the index is extracted and registered as another watch item.

This applies only when a device/label that can be monitored is used as an index.

■Title of a watch window

During watching, "[Automatic Registration: Watching]" and the following character strings are added in the title of a watch window.



| Character string | Description | Target device/label |
|---------------------------------|--|---|
| (1) Program block name | The program block name displayed in the navigation window is added. For an SFC program, the block number is not displayed. | Devices/labels that satisfy none of the following conditions: <ul style="list-style-type: none"> • It is defined as a global label. • It is used in a ladder program. • It has no arguments. |
| (2) Program type | Any of the following character strings is added depending on the program type: <ul style="list-style-type: none"> • Program: PRG • Function block: FB • Function: FUN • When the type cannot be identified: Nothing is displayed. | |
| (3) Programming language | Any of the following character strings is added depending on the programming language: <ul style="list-style-type: none"> • Ladder Diagram: LD • Structured Text: ST • Function Block Diagram/Ladder Diagram: FBD/LD • Sequential Function Chart: SFC^{*1} | |
| (4) Data name of a global label | The data name of a global label displayed in the navigation window is added. | FB instances that satisfy all the following conditions: <ul style="list-style-type: none"> • It is defined as a global label. • It is used in a ladder program. • It has no arguments. |
| (5) Label type | Any of the following character strings is added: <ul style="list-style-type: none"> • Local label: LocalLabel • Global label: GlobalLabel • Safety global label: SafetyGlobalLabel | |

*1 When registering devices/labels in a Zoom (action) automatically, the character string indicating the programming language of the Zoom is displayed.

Applicable monitoring devices

The following table shows the devices that can be monitored in a watch window.




For the available devices in a CPU module, refer to the user's manual of each module.


| Module type | Device |
|--------------------|---|
| RCPU LHCPU | X, Y, M, L, B, F, SB, V, T, T(TS), T(TC), T(TN), ST, ST(STS), ST(STC), ST(STN), LT, LT(LTS), LT(LTC), LT(LTN), LST, LST(LSTS), LST(LSTC), LST(LSTN), C, C(CS), C(CC), C(CN), LC, LC(LCS), LC(LCC), LC(LCN), D, W, SW, FX, FY, SM, SD, FD, J□\X, J□\Y, J□\B, J□\SB, J□\W, J□\SW, U□\G, U□\HG, DX, DY, Z, LZ, R, ZR, RD, BL, BL□\S, SA\M, SA\SM, SA\X, SA\Y, SA\B, SA\D, SA\SD, SA\W, SA\T(TC), SA\T(TS), SA\T(TN), SA\T, SA\C(CC), SA\C(CS), SA\C(CN), SA\C, SA\ST(STC), SA\ST(STS), SA\ST(STN), SA\ST |
| FX5CPU | X, Y, M, L, B, F, SB, S ^{*1} , T, T(TS), T(TC), T(TN), ST, ST(STS/SS), ST(STC/SC), ST(STN/SN), C, C(CS), C(CC), C(CN), LC, LC(LCS), LC(LCC), LC(LCN), D, W, SW, SM, SD, U□\G, Z, LZ, R, BL, BL□\S |
| Remote head module | X, Y, SB, W, SW, SM, SD, U□\G, DX, DY, RD |

*1 Its current value cannot be changed.

Changing current values

Directly enter a value for "Current Value" during monitoring.

For a bit device, select a row and double-click with pressing the  key or press the  +  keys to change the current value.

For a step relay (S), step relay with block specification (BL□\S), and SFC block device (BL), the blocks/steps are activated/deactivated by changing the current values. ( Page 652 Changing the active status)

Precautions

- When "Use File Register of Each Program" is selected in "File Setting" of "CPU Parameter," a file register file that is available at the END will be changed. Therefore, changing the current values by specifying a file register file for each program is not available.
- For bit type array global labels that are specified in digit specification, the current values can be changed when devices have been assigned to them.
the current values of global labels to which devices are assigned and local labels cannot be changed.
- When the label name of a label registered in a watch window is changed in a label editor, the label name before the change is displayed as a character string. To check the current value, register the changed label name.

Exporting/importing information to/from a file

Information displayed in a watch window can be exported to and imported from a file.

Operating procedure

Select a row in a watch window, then right-click it and select [Export to File] or [Import File].

Monitoring in a binary format

The current value of a label can be displayed in a binary format during monitoring. Select a row of the label, then right-click and select [Add the Selected Label to Binary Watch Window] from the shortcut menu to display it.

■Adding a label

To add a label to the "Binary Watch" screen, select a row of the label while the "Binary Watch" screen is opened, then right-click and select [Add the Selected Label to Binary Watch Window] from the shortcut menu.

■Setting the display format


The display format (display unit format, data display format, string display format, value, bit order, and switch No. of points) of the monitoring value of the label being displayed can be set.

Operating procedure

1. Click the [Open Display Format] button.
2. Set each item in the "Display Format" screen and click the [OK] button.

■Changing current values

Current values can be changed by any of the following operations:

- Double-click a cell of a label.
- Press the  key.
- Select and right-click a cell of a label or the "Current Value" column, then select [Modify Value] from the shortcut menu.



14.5 Turning Input/Output Devices ON/OFF Forcibly

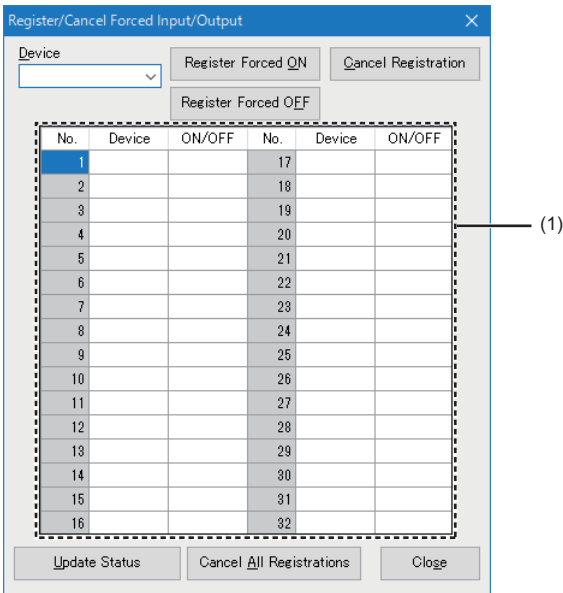
While GX Works3 and a CPU module are connected, input/output devices can be turned ON/OFF forcibly without being affected by the input from an external device or by a program operation result.

Input/output devices refer to inputs (X) or outputs (Y).

RnCPUs, RnENCPUs, RnP CPUs, RnSFCPU s, LHCPU s, and FX5CPU s support this function.

Window

Select [Debug] ⇒ [Register/Cancel Forced Input/Output]( / ).



(1) Registration status display area

Forced ON/OFF registration

Forced ON/OFF of a device can be registered in a CPU module.

Operating procedure

1. Enter the device name of an available input (X) or output (Y) in the "Device" column.
2. Click the [Register Forced ON] button or the [Register Forced OFF] button.

The registered device turns ON/OFF until the registration is canceled.

Registration cancellation

The registration of devices for forcibly turning ON/OFF can be canceled.

Operating procedure

1. Enter the device name of a registered input (X) or output (Y) in the "Device" column.
2. Click the [Cancel Registration] button.

Registration status reading

The latest registration status can be read from a CPU module, and can be displayed in the 'Registration status display area.'

Operating procedure

Click the [Update Status] button.

Batch cancellation of registration

All the registered devices for forcibly turning ON/OFF can be canceled.

Operating procedure

Click the [Cancel All Registrations] button.

Considerations

- This function is not controlled exclusively on a CPU module side. The registered contents may be changed by a peripheral device connected via another station.
- Even when forcibly turning devices ON/OFF by using the change current value function, a current value of the device for which forced ON/OFF is registered is not changed.

■RnPCPUs (redundant mode)

When GX Works3 is connected to an RnPCPU (redundant mode), a type of the system (control system or standby system) of the connected CPU module on the connected system is displayed in the title of the "Register/Cancel Forced Input/Output" screen.

The following table shows the availability of the buttons in the "Register/Cancel Forced Input/Output" screen for each system of the CPU module on a connected system.

○: Available, ×: Not available

| System | Button | | | | |
|---|--------------------|---------------------|---------------------|---------------|--------------------------|
| | Register Forced ON | Register Forced OFF | Cancel Registration | Update Status | Cancel All Registrations |
| Control system (Other system: standby system) | ○ | ○ | ○ | ○*1 | ○ |
| Control system (Other system: other than standby system) | × | × | × | × | × |
| Standby system | × | × | × | ○*1 | × |
| Not specified | × | × | × | × | × |

*1 Only the registration status of the CPU module on the connected system is read.

14.6 Changing Device/Label Value by Setting Conditions

To change a device or label value according to the conditions which were set in advance, use the device test function with execution conditions.

By using this function, the operation of the specific ladder block can be checked without changing the program (standard program).

For details on a device test with execution conditions, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

In this section, execution conditions, a device or label value, and the processing to be registered into a CPU module are referred to as a 'device test with execution conditions.'

This function can be used in projects for an RnCPU, RnENCPU, RnPCPU, RnSFCPU in the test mode, and LHCPU.

For RnPCPUs (redundant mode), registration, registration cancellation, and registration status update of a device test with execution conditions are performed only in the connective system.

For RnSFCPUs in the safety mode, a device test with execution conditions cannot be registered or cancelled.

Registration of a device test with execution conditions

The following shows the registration method of a device test with execution conditions.

Window

Select [Debug] ⇒ [Device Test with Execution Condition] ⇒ [Register].

■ Bit device and bit type label

The dialog box 'Register Device Test with Execution Condition' is shown. It has a 'Device/Label' dropdown set to 'X0' and a 'Data Type' dropdown set to 'Bit'. There are 'Forced ON' and 'Forced OFF' buttons. The 'Execution Condition' section includes a 'Program Block' dropdown set to 'ProgPou', a note 'Only ladder blocks can be selected (except for Zoom).', a 'Step No.' text box with '20', and an 'Execution Timing' dropdown set to 'Before executing instruction'. A 'Close' button is in the top right.

■ Word device and word type label

The dialog box 'Register Device Test with Execution Condition' is shown. It has a 'Device/Label' dropdown set to 'D10' and a 'Data Type' dropdown set to 'Word [Signed]'. There is a 'Setting Value' text box with '100' and a 'Setting' button. The 'Execution Condition' section includes a 'Program Block' dropdown set to 'ProgPou', a note 'Only ladder blocks can be selected (except for Zoom).', a 'Step No.' text box with '37', and an 'Execution Timing' dropdown set to 'Before executing instruction'. A 'Close' button is in the top right.

Operating procedure

1. Set each item.

| Item | | Description |
|---------------------|------------------|--|
| Device/Label | | Set a device or label whose value is to be changed. The settable devices and labels are as follows: <ul style="list-style-type: none"> • Global device • Global label • Local device usable in a program block specified as an execution condition • Local label usable in a program block specified as an execution condition Note that when a set label name is used for both a global label and local label, the local label is set. |
| Data Type | | Select the data type of the set device or label. |
| Setting Value | | Set a device or label value when the data type other than the bit type is set. |
| Execution Condition | Program Block | Select a program block name. Note that ladder program only can be selected. |
| | Step No. | Set a step in the set program block. |
| | Execution Timing | Select the timing of the change to the set value either before or after execution of the instruction in the set step No. |

2. Click the [Forced ON]/[Forced OFF]/[Setting] button.

The device test with execution conditions is registered into a CPU module.

14

Point

By registering a device test with execution conditions into a CPU module, the instruction in the step specified as an execution condition is framed.



Precautions

The registration of a device test with execution conditions is canceled by performing an operation such as resetting or cycling the power of the programmable controller, or writing a program to the CPU built-in memory.

For details, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

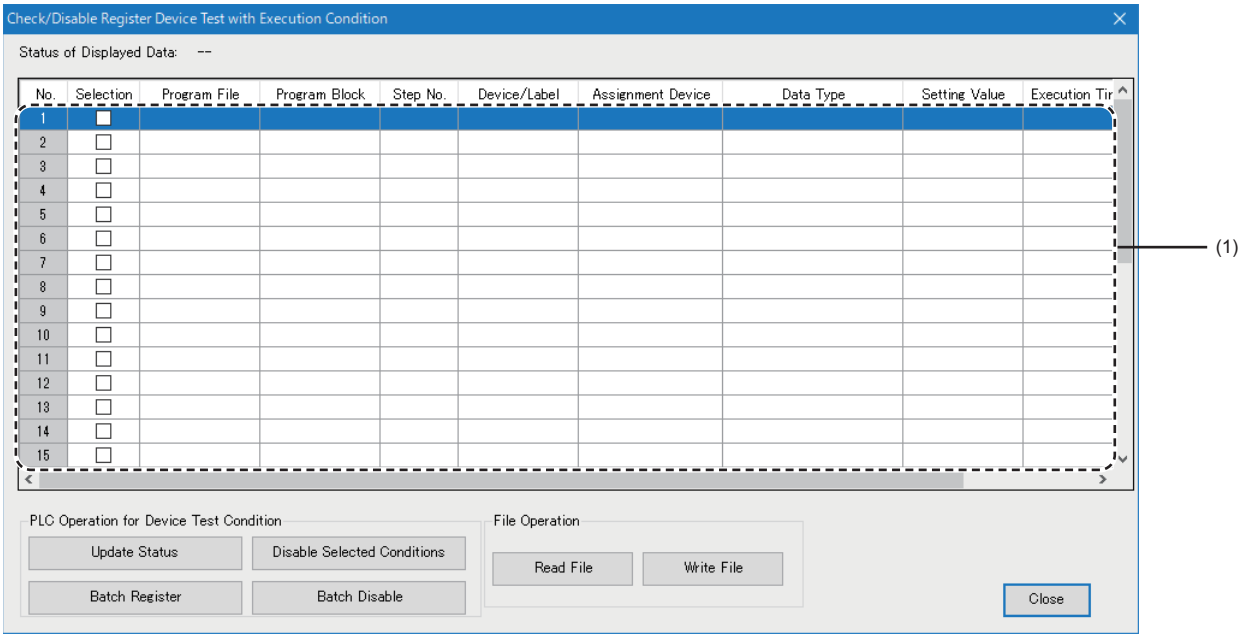
Displaying a registered device test with execution conditions

The following operations can be performed to a registered device test with execution conditions.

- Page 671 Registration check
- Page 671 Registration cancellation
- Page 671 Batch registration
- Page 671 Batch registration cancellation
- Page 671 Data writing to a file
- Page 671 Data reading from a file

Window

Select [Debug] ⇒ [Device Test with Execution Condition] ⇒ [Check/Disable Register](/).



(1): Registration content list

Displayed items

| Item | Description |
|---------------------------|---|
| Status of Displayed Data | The status of data in the registration content list is displayed. —: Indicates that a device test with execution conditions is not read yet. Update Status: Indicates that a device test with execution conditions which was read from a CPU module is displayed. Read File: Indicates that a device test with execution conditions which was read from a file is displayed. |
| Registration content list | The read device test with execution conditions is displayed. |

Registration check

The following shows the procedure for checking a device test with execution conditions registered into a CPU module.

Operating procedure

Click the [Update Status] button.

Registration cancellation

The following shows the procedure for canceling the registration of a device test with execution conditions displayed in the registration content list.

Operating procedure

1. Select the checkbox(s) of a device test with execution conditions to cancel the registration.
2. Click the [Disable Selected Conditions] button.

Batch registration

The following shows the procedure for registering a device test with execution conditions displayed in the registration content list to a CPU module in a batch.

Operating procedure

Click the [Batch Register] button.

Batch registration cancellation

The following shows the procedure for canceling a device test with execution conditions registered into a CPU module in a batch.

Operating procedure

Click the [Batch Disable] button.



In another way, the registration can be canceled in a batch by using the following menu.

- Select [Debug] ⇒ [Device Test with Execution Condition] ⇒ [Batch Disable]

Data writing to a file

The following shows the procedure for writing a device test with execution conditions displayed in the registration content list to a file.

Operating procedure

1. Click the [Write File] button.
2. Set each item and click the [Save] button.

Data reading from a file

The following shows the procedure for reading a device test with execution conditions from a file to the registration content list.

Operating procedure

1. Click the [Read File] button.
2. Set each item and click the [Open] button.

14.7 Pausing/Restarting the Operation of Function Blocks

While running a program, the operation of a process control function block in an FBD/LD editor can be paused or restarted. The operation of a program can be checked by pausing the operation of the preceding process control function block and changing the current value of the output variable of the paused process control function block. Moreover, paused process control function blocks can be checked in a list.

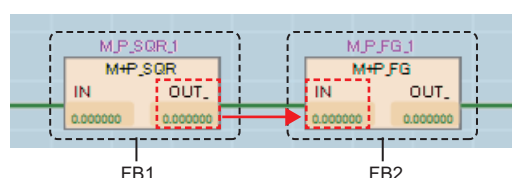
Function blocks that can be paused or restarted

The operation of the following process control function blocks can be paused or restarted.

- Standard process FBs (excluding standard process FBs for 'Analog Value Selection/Average')
- Tag access FB
- Tag FB

Application example of this function

The following explains the method for changing the current value of the input variable of the FB2 in the following figure to check the operation of the program.



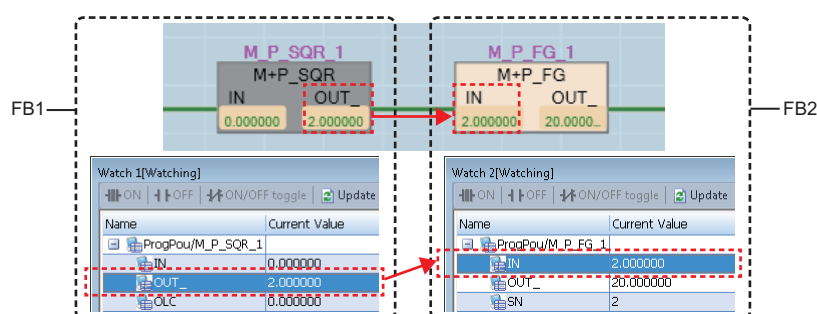
Even if the current value of the input variable (IN) of the FB2 is changed using the change current value function, the value will be overwritten with the current value of the output variable (OUT_) of the FB1 because the FB1 is in operation.

To change the current value of the input variable of the FB2, pause the operation of FB1 first, and then change the current value of the output variable of the FB1.

Operating procedure

1. Pause the operation of the FB1. (☞ Page 673 Pause)
2. Change the current value of the output variable (OUT_) of the FB1. (☞ Page 632 Changing current values)


The changed current value is stored to the input variable (IN) of the FB2.



Pause

The following shows the procedure to pause the operation of a process control function block.

Operating procedure

1. Monitor an FBD/LD program for process control. (☞ Page 643 Monitor)
 2. Select a process control function block in the program editor.
 3. Click the smart tag .
- Alternatively, select [Debug] ⇒ [Process Control Extension] ⇒ [Pause FB].

The operation of the process control function block is paused.

Point

By setting 'automatic registration to watch windows,' when the operation of a process control function block is paused, devices and labels used for the paused process control function block are automatically registered to a watch window and that makes it easy to change current values of input and output variables used for the process control function block.

For details on 'automatic registration to watch windows,' refer to the following:

☞ Page 663 Automatic registration to watch windows

14

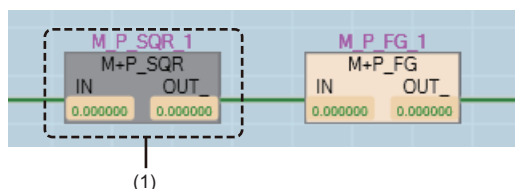
Precautions

- After checking the operation of a program, restart the operation of all the paused process control function blocks. (☞ Page 674 Restart, Page 674 List display)
- When one FB instance is used for multiple programs in a project, if the operation of any one of the FB instance is paused, all of the other operations of FB instances will be paused as well.

Display in pausing

The background color of a paused process control function block is displayed in gray.

Ex.



(1): Paused process control function block


Point

The background color of a paused process control function block can be changed in the "Color and Font" screen. (☞ Page 82 Checking and Changing Colors and Fonts)

Restart

The following shows the procedure to restart the operation of a paused process control function block.

Operating procedure

1. Select a paused process control function block in a program editor.
2. Click the smart tag ().
Alternatively, select [Debug] ⇒ [Process Control Extension] ⇒ [Restart FB].

The operation of the process control function block is restarted.

List display

The following shows the procedure to display paused process control function blocks in a list.


Operating procedure

Select [Debug] ⇒ [Process Control Extension] ⇒ [Paused FB List].

Paused process control function blocks are displayed in the "Output" window.

Point

By selecting a row in the "Output" window and performing any of the following operations, the cursor jumps to the position where an FB instance of the process control function block is used.

- Double-click the row.
- Right-click the row, and select [Jump] from the shortcut menu.
- Press the  key.

Precautions

- After checking the operation of a program, check that all the process control function blocks are running.
- Function blocks in a program that is protected by a security key or block password are not displayed.

14.8 Measuring the Scan Time of a Program

To measure the scan time of any sections in a ladder program (including a Zoom) and SFC program, use the scan time measurement function.

This function can also measure the processing time of a subroutine program or interrupt program.

For details on the scan time measurement function, refer to the following:

MELSEC iQ-R CPU Module User's Manual (Application)

Window

Select [Debug] ⇒ [Scan Time Measurement].

Ex.
Screen displayed when a ladder editor is active

Scan Time Measurement

Measurement Target

Program NameMAIN

Start

Program Block NameProgPou

Step No.0

End

Program Block NameProgPou

Step No.1

Start

Stop

Close

Scan Time

Initial Value

Current Value

Maximum Value

Minimum Value

ms

ms

ms

ms

Operating procedure

1. Set each item.

| Item | | Description |
|--------------------|--------------|---|
| Measurement Target | Program Name | The name of an open program is displayed. |
| | Start*1 | Program Block Name |
| | | Step No. |
| | End*1 | Program Block Name |
| | | Step No. |
| | Block Name*2 | An SFC block name is displayed. |
| | Step Name*2 | Set a start step name. |

*1 Displayed when a ladder editor is active or an action is selected on an SFC diagram.

*2 Displayed when an SFC diagram editor is active without an action selected.

2. Click the [Start] button.

The initial value, current value, maximum value, and minimum value are measured.


Time can be measured in 0.001 ms.

- When the "Scan Time Measurement" screen is opened while a ladder block is selected in a ladder editor, the selected range is entered in "Step No." automatically.
- For a ladder program, when the specified start or end step is in the middle of a ladder block, the step is set in a unit of the ladder block including the selected range.

Precautions

- A scan time cannot be measured in a safety program.
- A scan time cannot be measured depending on the specified start or end step.

For details, refer to the following:

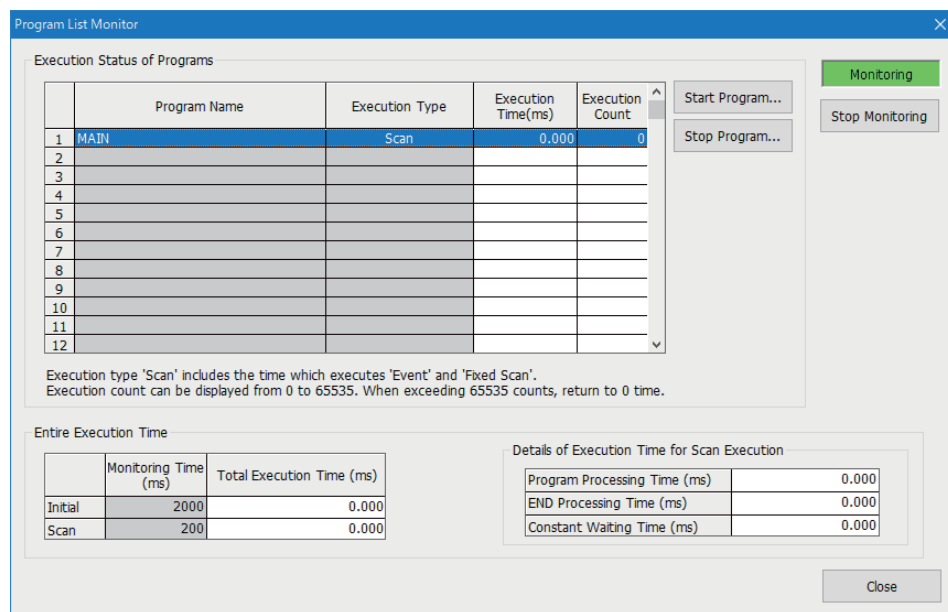
 MELSEC iQ-R CPU Module User's Manual (Application)

14.9 Checking the Processing Time of a Program

To check the processing time of a program being executed, use the program list monitor.
FX5CPUs and remote head modules do not support this function.

Window

Select [Online] ⇒ [Monitor] ⇒ [Program List Monitor].



14

Displayed items

| Item | | Description |
|--|------------------------------|---|
| Execution Status of Programs | Execution Time (ms) | Displays the actual scan time (current value). The display contents are differ depending on the program execution type. At the program stop (standby) state: 0.000 ms |
| | Execution Count | Displays the number of executions, counted from '0' at the point of turning the CPU module to the RUN state. It is stored even after the program stops. |
| Entire Execution Time | Monitoring Time (ms) | Displays the program execution monitoring time set in "PLC RAS" of "CPU Parameter." |
| | Total Execution Time (ms) | Displays the total scan time of the programs executed in the CPU module. |
| Details of Execution Time for Scan Execution | Program Processing Time (ms) | Displays the total execution time of scan execution type program. |
| | END Processing Time (ms) | Displays the END processing time. |
| | Constant Waiting Time (ms) | Displays the waiting time of the constant scan when the constant scan is set. |
| [Start Program] button | | Click this to start a desired program. (Page 678 Starting a program) |
| [Stop Program] button | | Click this to stop a desired program. (Page 678 Stopping a program) |

Starting a program

The following shows the procedure for starting a desired program.

A program of which the execution type is "Standby" can be started when a CPU module is in the RUN state.

Programs with the execution types other than "Standby" cannot be started.

Operating procedure

1. Click the [Start Program] button.
2. Set each item in the "Start Program" screen, and click the [Execute] button.

Stopping a program

The following shows the procedure for stopping a desired program.

A program of which the execution type is "Scan" can be stopped when a CPU module is in the RUN state.

Programs with the execution types other than "Standby" cannot be stopped.

Operating procedure

1. Click the [Stop Program] button.
2. Set each item in the "Stop Program" screen, and click the [Execute] button.

Point

The operations when stopping a program differ as follows depending on the item selected in "Stop Mode" of the "Stop Program" screen.

- Stop output after stop: The OUT instructions turn OFF at the next scan of the program. In the subsequent scans, the program execution type is changed to "Standby." (Same operations as the POFF instruction)
- Hold output after stop: The program execution type is changed to "Standby," and the output of OUT instructions is retained. (Same operations as the PSTOP instruction)

Precautions

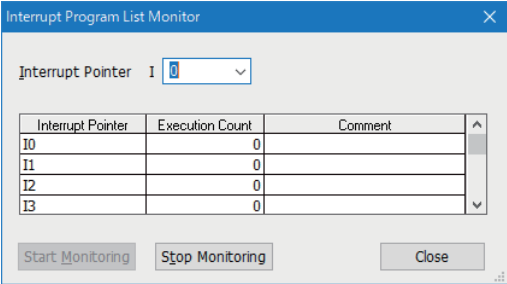
If the system is switched when stopping a program of an RnPCPU (redundant mode), the execution type of the stopped program is applied to the control system after switching.

14.10 Checking Execution Counts of Interrupt Programs

To check the execution count of interrupt programs used in a program, use the interrupt program list monitor function. FX5CPUs and remote head modules do not support this function.

Window

Select [Online] ⇒ [Monitor] ⇒ [Interrupt Program List Monitor].



Operating procedure

Input the interrupt pointer number of which execution counts are to be displayed in "Interrupt Pointer."

Displayed items

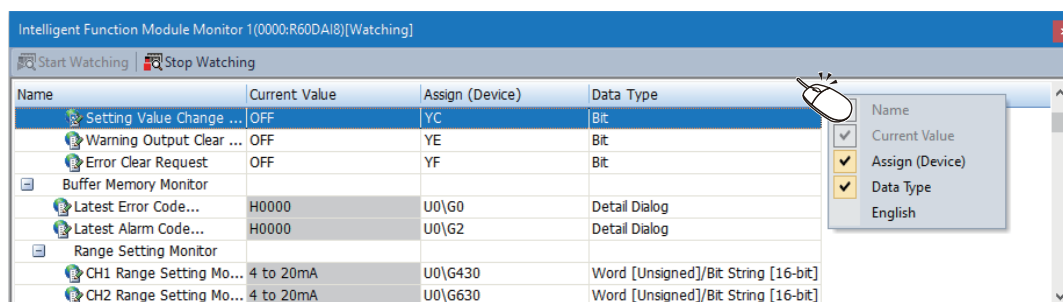
| Item | Description |
|-----------------|---|
| Execution Count | Starts counting when the CPU module turns to the RUN state and displays the execution counts. When reaching 65536, it returns to 0. |

14.11 Checking Current Values in an Intelligent Function Module

To check the current value of I/O signals and buffer memory of an intelligent function module, use the intelligent function module monitor.

Window

Select [View] ⇒ [Docking Window] ⇒ [Intelligent Function Module Monitor] ⇒ [Intelligent Function Module Monitor 1] to [Intelligent Function Module Monitor 10].



Operating procedure

1. Register an intelligent function module to be monitored. (📖 Page 681 Registration of an intelligent function module)
2. Select [Online] ⇒ [Watch] ⇒ [Start Watching].

During monitoring, "[Watching]" is added in the title of the "Intelligent Function Module Monitor" window.

Point

Select and right-click the module information, and then select [Copy] from the shortcut menu to paste it to a text file.

Detailed display of monitor items

■Detailed display of log information

The details of log information can be displayed during monitoring.

Double-click a row in which "Detail Dialog" is displayed in "Data Type" column, or right-click and select [Detailed Dialog] from the shortcut menu.

When the menu is not selectable, it is not supported by the module.

■Detailed display of error codes/alarm codes

The details of an error code/alarm code can be displayed in the "Intelligent Function Module Monitor" window and the detailed dialog.

Double-click a row in which an error code/alarm code is displayed, or right-click and select [Detailed Display] from the shortcut menu.

Precautions

The intelligent function module monitor updates current values only within the range displayed on the window for monitoring acceleration.

When performing operation such as copy and paste on Excel, "--" or the previously monitored current value is displayed for the data outside the range displayed on the window.

Registration of an intelligent function module

The following shows the procedures to register an intelligent function module to be monitored in the "Intelligent Function Module Monitor" window.

Operating procedure

■ Drag-and-drop (from the navigation window)

1. In the navigation window, select a module to be registered.
2. Drag and drop it onto the "Intelligent Function Module Monitor" window.

■ Shortcut menu (in the navigation window)

1. In the navigation window, select a module to be registered in the "Intelligent Function Module Monitor" window.
2. Right-click it and select [Register to Intelligent Function Module Monitor] from the shortcut menu.

■ Shortcut menu (in the "Intelligent Function Module Monitor" window)

1. Right-click on the "Intelligent Function Module Monitor" window and select [Register Module Information] from the shortcut menu.
2. Select a module to be registered in "Module List," and click the [OK] button.

When a positioning module is selected in "Module List," select the item displayed in "Monitor Item Category List."

Point

Module information can be copied and pasted to a file such as a text file by right-clicking any module information and selecting [Copy] from the shortcut menu in the "Intelligent Function Module Monitor" window.

Registration of a device station

The following shows the procedures to register a device station on CC-Link IE TSN to be monitored in the "Intelligent Function Module Monitor" window.

FX5CPUs do not support this.

Operating procedure

■ Drag-and-drop (from the navigation window)

1. In the navigation window, select a master station.
2. Drag and drop it onto the "Intelligent Function Module Monitor" window.
3. Select the master station in "Module List" and a device station in "Monitor Item Category List," then click the [OK] button.

■ Shortcut menu (in the navigation window)

1. In the navigation window, select a master station.
2. Right-click it and select [Register to Intelligent Function Module Monitor] from the shortcut menu.
3. Select the master station in "Module List" and a device station in "Monitor Item Category List," then click the [OK] button.

■ Shortcut menu (in the "Device Assignment Confirmation" screen)

1. In the "Device Assignment Confirmation" screen, select a device station to be registered in the "Intelligent Function Module Monitor" window.
2. Right-click it and select [Register to Intelligent Function Module Monitor] from the shortcut menu.
3. Select the master station in "Module List" and a device station in "Monitor Item Category List," then click the [OK] button.

■ Shortcut menu (in the "Intelligent Function Module Monitor" window)

1. Right-click on the "Intelligent Function Module Monitor" window and select [Register Module Information] from the shortcut menu.
2. Select the master station in "Module List" and a device station in "Monitor Item Category List," then click the [OK] button.

Precautions

Match the network configuration settings and parameters for refresh devices between the actual system and a project. Otherwise, the refresh devices and buffer memory addresses are not set correctly in the intelligent function module monitor and a device station cannot be monitored properly.

14.12 Checking Current Logging Data

Logging data collected by a CPU module can be checked with the trend graph function in GX LogViewer.

To check the current logging data, display the data on the realtime monitor graph.

For details, refer to the following:

 GX LogViewer Version 1 Operating Manual

Procedure for using the realtime monitor

When registering the data name and data type of a selected device/label automatically to the "Realtime Monitor Setting" screen of GX LogViewer, start the operation from step 1. When not registering the data name and data type automatically, start from step 2.

Operating procedure

1. Select a device/label in any of the following windows of GX Works3:

- Ladder editor
- ST editor
- FBD/LD editor
- Watch window

2. Perform either of the following operations in GX Works3:

- Select [Tool] ⇒ [Realtime Monitor Function].
- Right-click the device/label and select [Wave Display (Realtime Monitor)] from the shortcut menu.

"Realtime Monitor Setting" screen of GX LogViewer appears.

3. Configure the monitoring settings in the "Realtime Monitor Setting" screen, and click the [Monitor Start] button.

For the operation methods of GX LogViewer, refer to the following:

 GX LogViewer Version 1 Operating Manual

Point

The following information is applied to GX LogViewer when the "Realtime Monitor Setting" screen of GX LogViewer appears:

- Module type information of a project
- Current connection destination of a project
- Display language
- Data name and data type of a device/label

Precautions

The data name and data type of a label used in a project for an RnPCPU or an RnPSFCPU are not registered automatically.

14.13 Checking Tag Data

Checking tag data on the gauge window (faceplate)

'Faceplate' is a screen to display the image of a device such as a controller. The contents of tag data of a tag FB is displayed on it.

The status of the corresponding process can be monitored and a condition can be set by accessing the tag data.

A faceplate displays data and allows to manipulate the values of each tag data item as well.

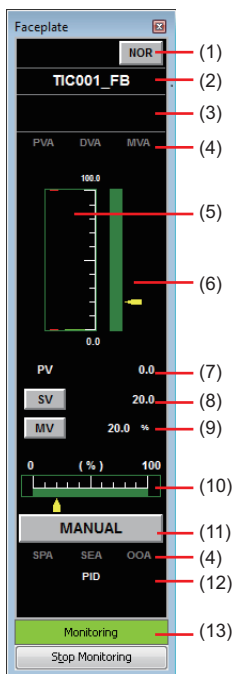
Up to four faceplates can be displayed simultaneously.

For details on tag FBs, refer to the following:

MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

Window

1. Start monitoring an FBD/LD program for process control.
2. Select a tag FB on the FBD/LD editor.
3. Select [Online] ⇒ [Monitor] ⇒ [Faceplate].



A faceplate can be displayed only while monitoring the call source program. Therefore, a faceplate will be closed if the monitoring is stopped due to an error such as a communication error.

Displayed items

| Item | Description |
|------------------------------|---|
| (1) I/O mode display area | When the tag type is a loop tag or status tag, the current I/O mode is displayed. The "Change I/O Mode" screen appears by clicking this button. The I/O mode is classified into the following four types. <ul style="list-style-type: none">• NORMAL(NOR)• SIMULATION(SIM)• OVERRIDE(OVR)• TAG STOP(TSTP) The I/O mode can be changed only when the control mode is MANUAL mode. |
| (2) Tag name display area | A tag name is displayed. |
| (3) Tag comment display area | A comment defined on the tag FB setting editor is displayed. |
| (4) Alarm display area | A tag alarm is displayed. |

| Item | Description |
|-----------------------------------|--|
| (5) PV value bar display area | The current PV value is displayed in a bar format. A graph in the range of the upper and lower limits of the PV engineering value is displayed. An alarm bar is displayed if any of the following is set; PV high high limit alarm value, PV high limit alarm value, PV low limit alarm value, and PV low low limit alarm value. |
| (6) SV value bar display area | The range of the SV high limit value and the SV low limit value is displayed with the green bar. The current SV value is displayed with the yellow pointer. |
| (7) PV value setting/display area | The current PV value is displayed in a numerical value. The button is displayed only when the I/O mode is OVERRIDE mode. Click the button to display the PV value setting dialog. |
| (8) SV value setting/display area | The current SV value is displayed in a numerical value. Click the button to display the SV value setting dialog. |
| (9) MV value setting/display area | The current MV value is displayed in a numerical value. (Unit: %) Click the button to display the MV value setting dialog. |
| (10) MV value bar display area | The range of the MV high limit value and the MV low limit value is displayed with the green bar. The current MV value is displayed with the yellow pointer. |
| (11) [Control mode change] button | When the tag type is a loop tag or status tag, the current control mode is displayed. Click the button to display the control mode change dialog. The control mode is classified into the following six types. <ul style="list-style-type: none"> • MANUAL(MAN) • AUTO(AUT) • CASCADE(CAS) • COMPUTER MV(CMV) • COMPUTER SV(CSV) • CASCADE DIRECT(CASDR) When OVERRIDE mode is set for the I/O mode, the control mode cannot be changed from MANUAL mode to another one. |
| (12) Tag type display area | The tag type is displayed. |
| (13) Monitor status display area | The current monitor status is displayed. |

■Tag alarm

- PVA, DVA, MVA, SVA display area

| Classification | Displayed character ^{*1} | Description |
|----------------|-----------------------------------|--|
| Loop tag | PVA | PV-related Positive/negative variation rate Input high high/high/low/low low limit |
| | DVA | DV-related Large deviation |
| | MVA | MV-related Output variation rate limit Output high/low limit |
| | SVA | SV-related SV variation rate limit SV high/low limit |
| Status tag | AL1 | Time-out-related <ul style="list-style-type: none"> ■When the tag type is NREV, REV, MVAL1, MVAL2 Time-out over ■When the tag type is MTR2, MTR3, SS2P, DS2P, DS3P Mismatch between status answer and output signal |
| | AL2 | Trip-related Current and overload trip |
| | AL3 | Communication error-related Communication error |
| | AL4 | Status answer indefinite-related Indefinite device status (multiple status answer input) |
| Other tags | (Nothing displayed) | |

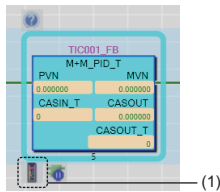
*1 An alarm which is not including for the corresponding tag type is not displayed.

- SPA, SEA (or HBOA), OOA display area

| Classification | Displayed character | Description |
|----------------|--------------------------|--|
| Loop tag | SPA | Stop alarm <ul style="list-style-type: none"> • When SPA turns ON, the 'SPA' part changes to a button. • Click the button to reset SPA. |
| | SEA or HBO ^{*1} | Sensor error (SEA) <ul style="list-style-type: none"> • SEA turns ON when a sensor error occurs. Heater failure (HBOA) <ul style="list-style-type: none"> • HBOA turns ON when a failure occurs in a heater. |
| | OOA | Output open alarm <ul style="list-style-type: none"> • OOA turns ON when output disconnection is detected in a user program. |
| Other tags | (Nothing displayed) | |

*1 HBOA is displayed as 'HBO.'

A smart tag(1) is displayed on the bottom left of a tag FB selected while monitoring a program.
By clicking a smart tag(1), a faceplate can be displayed.



Precautions

When using a faceplate in GX Works3 Version 1.101F or earlier, the latest PX Developer is required to be installed.
For GX Works3 Version 1.105K or later, PX Developer is not required.
Only alphanumeric characters can be used to enter a tag name and a tag comment in the tag FB setting for using a faceplate.

Details on the parts displayed on a faceplate

On a faceplate, the image of a part such as a lamp and the push button are displayed according to the tag data content to display.

Displayed parts are the same as the ones displayed on a faceplate for PX Developer. For details, refer to the following:

PX Developer Version 1 Operating Manual (Monitor Tool)

The manual above can be read by the following methods.

- Start PX Developer Monitor Tool, then select [Display operating manual] ⇒ [Monitor Tool] on the help menu.

When a tag FB monitor value is incorrect

The corresponding display area on a faceplate is filled with black.

In that case, close the faceplate and take the following corrective action. After that, display the faceplate again.

| Case that a monitor value regarded as incorrect | Corrective action |
|---|---|
| The project is not written to the programmable controller. | Convert (reassign) all programs, and write the project to the programmable controller. |
| The file register setting is not set. | Set the following items in "File Register Setting " of "CPU Parameter," and write the project to a programmable controller. <ul style="list-style-type: none"> • Use Or Not Setting: Use Common File Register in All Programs • Capacity: Specify the required size. • File name: Specify a device memory name to use. |
| A file register is not set for the latch (2). | Set the file register 'ZR (R)' for the latch (2) in "Device/Label Memory Area Detailed Setting" of "CPU Parameter," and write the project to a programmable controller. (Page 25 CPU parameter setting) |
| CPU parameters and the global label setting (file register)*1 are written simultaneously. | Write CPU parameters first, and turn the power of a CPU module OFF and ON or reset the CPU module. Then, write the global label setting (file register)*1 to the programmable controller. |

*1 When writing the global label setting to a CPU module, data of file registers in the range set in the following option is automatically written.

[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource" ⇒ "File Register: ZR"

PX Developer Monitor Tool interaction

An FBD/LD program for process control created in GX Works3 can be managed, monitored, and controlled in PX Developer Monitor Tool.

Moreover, a GOT screen project can be created using the GOT screen generator of PX Developer Monitor Tool.


To use this function, follow the procedure in the table below.

| No. | Procedure | Reference |
|-----|---|---|
| 1 | Export an assignment information database file in GX Works3. | Page 688 Exporting an assignment information database file |
| 2 | Set the assignment information database file in PX Developer. | IPX Developer Version 1 Operating Manual (Monitor Tool) |
| 3 | Monitor FBD/LD programs for process control in PX Developer Monitor Tool. | |
| | Create a GOT screen project in PX Developer Monitor Tool. | IPX Developer Version 1 Operating Manual (GOT Screen Generator) |

Exporting an assignment information database file

The following shows the procedure to export the assignment information database file of a GX Works3 project.

Operating procedure

1. Open a GX Works3 project where an FBD/LD program for process control is used.
2. Click  (Export Assignment Information Database File) in the toolbar.
3. Click the [Save] button in the "Export Assignment Information Database File" screen.
4. Check the displayed message, and select whether or not to use the GOT screen generator of PX Developer Monitor Tool.

The assignment information database file (*.FADB) is exported.

Point

By selecting "Yes" for the following option, an "_" (underscore) at the end of a tag name is deleted when exporting an assignment information database file.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "PX Developer Monitor Tool Interaction" ⇒ "Remove Underscore at the End of Tag Name"

Precautions

- When exporting an assignment information database file, only alphanumeric characters are available for a tag name and tag comment in the tag FB setting.
- When using the GOT screen generator of PX Developer Monitor Tool, export an assignment information database file in GX Works3 Version 1.045X or later.
- In PX Developer Monitor Tool Version 1.50C or earlier, an assignment information database file exported in GX Works3 Version 1.050C or later can be used, but set the value for the following option to '480' or lower before exporting. In that case, click the [Apply] button in the tag FB setting editor.
[Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "Maximum Number of Tags"

14.14 Setting Current Values of FB Properties as their Initial Values

In the "FB Property Management (Online)" screen, the current values of FB properties can be read from a programmable controller, and the values can be set as the initial values of the FB properties in the project.

For details on FB properties, refer to the following:

📖 Page 387 Setting Initial Values of FB Properties

FB Property Management (Online) screen

The following explains the details on the "FB Property Management (Online)" screen.

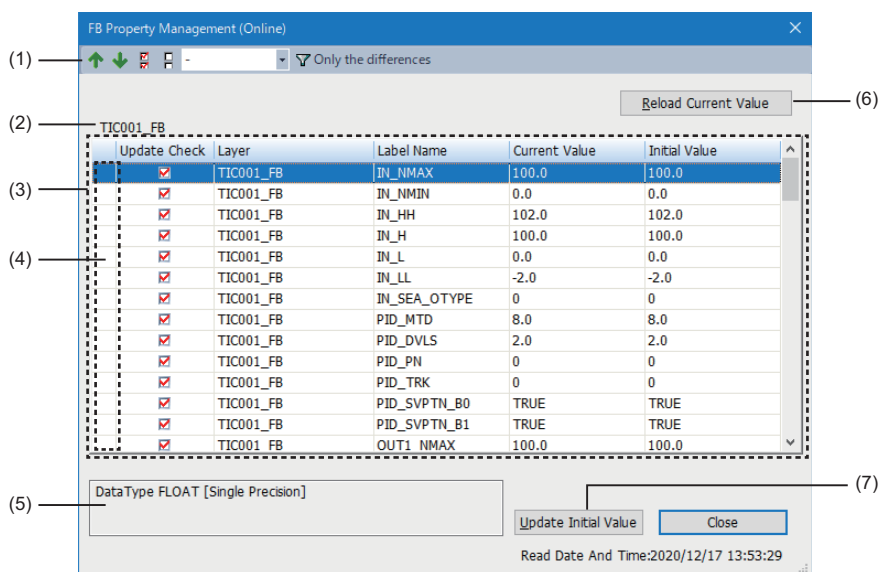
Window

■Updating the initial value of a selected FB property

1. Select a function block or tag FB in any of the following editors:

- Ladder editor
- ST editor
- FBD/LD editor
- Tag FB setting editor

2. Right-click it and select [FB Property] ⇒ [FB Property Management (Online)] from the shortcut menu.



Point

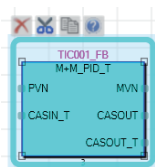
The "FB Property Management (Online)" screen can be displayed only in the following cases:

- Ladder editor: An FB instance is selected.
- ST editor: The cursor is placed on a token, or the whole token is selected.

```
FbPou_1_1();
```


```
FbPou_1_1|();
```

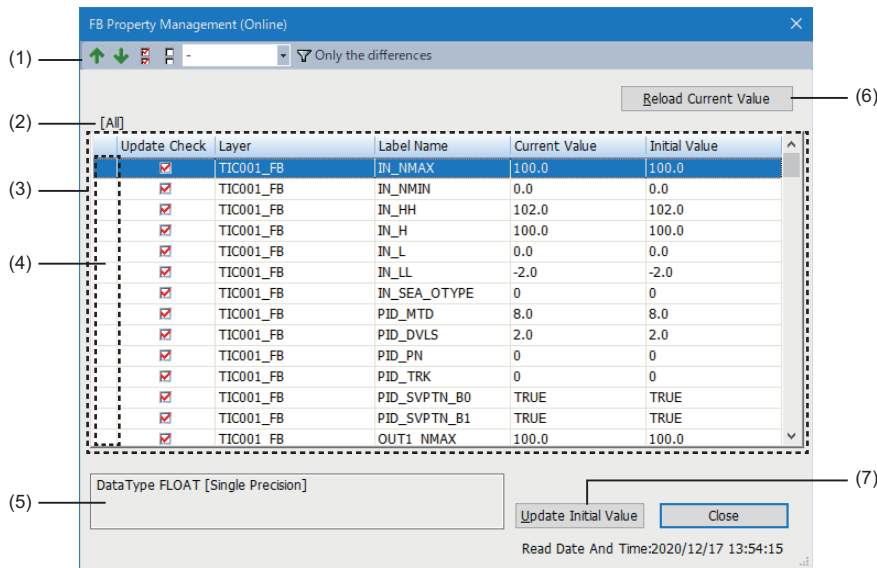
- FBD/LD editor: A whole function block is selected.








■Managing the initial values of all FB properties

Select [Online] ⇒ [FB Property Management (Online)].

Alternatively, select  (FB Property Management) ⇒ [FB Property Management (Online)] on the tool bal.



Displayed items

| Item | Description | |
|----------------------|---|--|
| (1) Toolbar |  | Previous difference |
| |  | Next difference |
| |  | Select All |
| |  | Deselect All |
| | - | Number of digits after decimal point specification |
| (2) FB instance name |  | Only the differences |
| | Filtering/clearing of a row with a difference | |

Click this to jump the cursor to the row with a difference in values (the row where the current value and initial value are different) before the current cursor position in the FB property list. (Always available)

Click this to jump the cursor to the row with a difference in values after the current cursor position in the FB property list. (Always available)

Click this to select all selectable FB property items in the FB property list. (Always available)

Click this to unselect all selected FB property items in the FB property list. (Always available)

Specify the number of digits after decimal point for the current value of which the data type is single precision or double precision. *1



- Without specification: —
- With specification: 1 to 14

The number of digits can be specified only when a row with a difference in values is not specified.

If filtering a row with a difference in values when the number of digits after the decimal point are specified, the row is filtered by keeping the setting. (Available only for the current value)

Click this to display only a row with a difference by filtering or to clear the filtering. Filtering will be cleared when the current value is reloaded while filtering.

The FB instance name of a selected function block or tag FB is displayed. "All" is displayed when reading the current values of all function blocks or tag FBs registered in a project.

| Item | Description | | | | | | | | | | |
|-----------------------------------|---|--------------|--|-------|--|------------|--|---------------|---|---------------|---|
| (3) FB property list | <p>The FB properties of a specified FB is displayed in a list when displaying the "FB Property Management (Online)" screen. FB properties of the following function blocks and tag FBs are displayed when displaying the "FB Property Management (Online)" screen by selecting [Online] ⇒ [FB Property Management (Online)].</p> <ul style="list-style-type: none"> • FB instance set for a global label • FB instance set for a local label in a program <table border="1"> <tr> <td>Update Check</td><td> <p>Select whether to set the current value as the initial value when the [Update Initial Value] button is clicked.</p> <ul style="list-style-type: none"> • Selected: The current value is set as the initial value. • Not selected: The current value is not set as the initial value. <p>The selection state is saved in a project for each FB instance.</p> </td></tr> <tr> <td>Layer</td><td> <p>The layer of the target function block and tag data are displayed.</p> <p>The display contents of each function block are as follows:</p> <ul style="list-style-type: none"> • Function block (local label definition): POU name/FB label name in a program • Function block (global label definition), tag FB: FB label name • Tag data: label name of tag data </td></tr> <tr> <td>Label Name</td><td>The FB property item name in a target function block is displayed.</td></tr> <tr> <td>Current Value</td><td> <p>The current value of an FB property acquired from a programmable controller is displayed.</p> <p>When the values between the current value and the initial value differ, the character string is displayed in red.*2</p> </td></tr> <tr> <td>Initial Value</td><td> <p>The initial value of an FB property acquired from a project is displayed.</p> <p>When the values between the current value and the initial value differ, the character string is displayed in red.*2</p> </td></tr> </table> | Update Check | <p>Select whether to set the current value as the initial value when the [Update Initial Value] button is clicked.</p> <ul style="list-style-type: none"> • Selected: The current value is set as the initial value. • Not selected: The current value is not set as the initial value. <p>The selection state is saved in a project for each FB instance.</p> | Layer | <p>The layer of the target function block and tag data are displayed.</p> <p>The display contents of each function block are as follows:</p> <ul style="list-style-type: none"> • Function block (local label definition): POU name/FB label name in a program • Function block (global label definition), tag FB: FB label name • Tag data: label name of tag data | Label Name | The FB property item name in a target function block is displayed. | Current Value | <p>The current value of an FB property acquired from a programmable controller is displayed.</p> <p>When the values between the current value and the initial value differ, the character string is displayed in red.*2</p> | Initial Value | <p>The initial value of an FB property acquired from a project is displayed.</p> <p>When the values between the current value and the initial value differ, the character string is displayed in red.*2</p> |
| Update Check | <p>Select whether to set the current value as the initial value when the [Update Initial Value] button is clicked.</p> <ul style="list-style-type: none"> • Selected: The current value is set as the initial value. • Not selected: The current value is not set as the initial value. <p>The selection state is saved in a project for each FB instance.</p> | | | | | | | | | | |
| Layer | <p>The layer of the target function block and tag data are displayed.</p> <p>The display contents of each function block are as follows:</p> <ul style="list-style-type: none"> • Function block (local label definition): POU name/FB label name in a program • Function block (global label definition), tag FB: FB label name • Tag data: label name of tag data | | | | | | | | | | |
| Label Name | The FB property item name in a target function block is displayed. | | | | | | | | | | |
| Current Value | <p>The current value of an FB property acquired from a programmable controller is displayed.</p> <p>When the values between the current value and the initial value differ, the character string is displayed in red.*2</p> | | | | | | | | | | |
| Initial Value | <p>The initial value of an FB property acquired from a project is displayed.</p> <p>When the values between the current value and the initial value differ, the character string is displayed in red.*2</p> | | | | | | | | | | |
| (4) Header | An error icon () is displayed when the current value cannot be set as the initial value. | | | | | | | | | | |
| (5) Explanation column | <p>The data type of a label selected in the FB property list and a label comment are displayed.</p> <p>A label comment can be displayed in the explanation column by setting the comment title of the comment as the display target on the "Multiple Comments Display Setting" screen*3. ( Page 83 Displaying and Reading Comments)</p> | | | | | | | | | | |
| (6) [Reload Current Value] button | Click this to read the current values of FB properties from the programmable controller again. | | | | | | | | | | |
| (7) [Update Initial Value] button | Click this to set the read current values of FB properties as the initial values. | | | | | | | | | | |

*1 When the digits after the decimal point are more than seven digits, the value is applied only for the item of the double precision. For the item of the single precision, six digits are applied.

*2 The current value and the initial value in the FB property list are compared in binary. (Example: 1.0 and 1.00 is considered as the same value.)

*3 Appears by selecting the following menu:
[View] ⇒ [Multiple Comments] ⇒ [Display Setting]

Point

Once the initial value is updated, a program related to a label of which the initial value was updated will be in the unconverted state.

PART 5

MAINTENANCE AND INSPECTION

This part explains the maintenance and inspection methods such as a function to protect data (prevent from falsification and data leakage) and display the system status of the CPU module.

15 PROTECTING DATA

16 MODULE DIAGNOSTICS



17 COLLECTING/REPRODUCING DATA

18 CHECKING/CHANGING MODULE OPERATION

15 PROTECTING DATA

This chapter explains the method for protecting data in a project.

The following table shows the functions to protect data.

| Purpose | Target | Function name | Reference |
|---|-----------------------------------|--|--|
| To prevent a program from being illegally accessed (for each POU) (Using a password) | Project | Block password | Page 695 Preventing Illegal Access to Programs (Block Password) |
| To prevent a program from being illegally accessed (for each program file) (Using a security key) | Project | Security key authentication for a project | Page 697 Preventing Illegal Access to Programs (Security Key) |
| To prevent a program from being illegally executed (Using a security key) | CPU module | Security key authentication for a CPU module | Page 704 Preventing Illegal Program Execution (Security Key) |
| To prevent a project from being illegally accessed (Using a password) | Safety project | User authentication for a project | Page 707 Preventing Illegal Access to a Project (User Authentication) |
| To prevent a CPU module from being illegally accessed (Using a password) | CPU module (RnPSFCPU and RnSFCPU) | User authentication for a CPU module | Page 710 Preventing Illegal Access to a CPU Module (User Authentication) |
| To prevent a file from being illegally read/written (Using a password) | CPU module SD memory card | File password | Page 717 Preventing Illegal Data Reading/Writing (File Password) |
| To restrict access from a communication route other than specific one (Using a password) | CPU module | Remote password | Page 724 Restricting Access from Other Than Specific Communication Route (Remote Password) |
| To prevent data from being illegally accessed and falsified (Using a password) | Project | Security version | Page 722 Preventing Illegal Access to/ Falsification of Data (Security Version) |
| To prevent data from being illegally accessed and falsified from a file in a CPU module (Using a password) | CPU module | | |
| To block access from an illegal IP address by identifying the IP address of an external device via Ethernet or CC-Link IE TSN (Setting in "Module Parameter") | CPU module | IP filter ^{*1} |  MELSEC iQ-R Ethernet User's Manual (Application)  MELSEC iQ-F FX5 User's Manual (Ethernet Communication) |

^{*1} Even when using the IP filter, illegal access may not be prevented completely. Take additional security measures system-wide, such as setting up a firewall for the network.

Operations when using CPU modules in a redundant system configuration

For RnPCPUs, the operations differ depending on the operation modes when executing the functions that the target is a CPU module.

RnPSFCPUs operate in the backup mode when executing the functions that the target is a CPU module.


| Operation mode | Operation |
|----------------|--|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). If an error occurs in the control system while performing any functions above, that is not performed to the standby system. If an error occurs in the standby system while performing any functions above, the status of control system is not restored to that before changed. |

15.1 Preventing Illegal Access to Programs (Block Password)

To prevent illegal access to a program (in a POU unit) by setting a password, use the Block password function.



Block password function

Operations can be restricted by registering a password for a POU.

- Restricted operation: Accessing to a POU (The operations will be allowed while the program is authenticated even if a password has been registered.)
- Target data: Program blocks, function blocks, and functions ( Page 102 Data configuration)


Procedure for using the block password function

Procedure for making a security enable

1. Set a block password for a POU. ( Page 695 Setting a block password)
2. Save a project. ( Page 129 Saving a project)

After closing a project in which the block password is set, the POU cannot be accessed when the file is opened next time.

Procedure for making locked POUs accessible

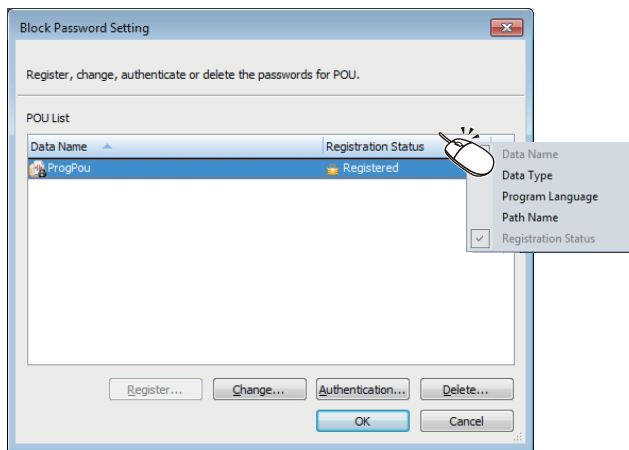
Authenticate the block password set to the POU. ( Page 696 Authenticating a block password)
The POU can be accessed while the project is opened.

Setting a block password

The following shows the screen for registering a block password to a POU.

Window

- Select [Project] ⇒ [Security] ⇒ [Block Password Setting].
- Select a POU in the navigation window, then right-click it and select [Block Password Setting] from the shortcut menu.



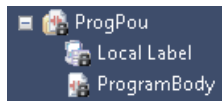
Registering/changing a block password

The following shows the procedure for registering/changing a block password for a POU.

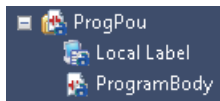
Operating procedure

1. Select a POU to set a block password and click the [Register]/[Change] button.
 2. Enter each item in the "Register Password" screen/"Change Password" screen, and click the [OK] button.
- When a block password is registered, the icons in the navigation window will be displayed as shown below.

Registered



Authenticated



Point

By selecting multiple POUs in "Data Name," a block password can be registered to the selected POUs in batch.

Authenticating a block password

The following shows the procedure for unlocking a POU temporarily by authenticating the password which has been set to the POU.

Once the password is authenticated, the data can be accessed until the project is closed.

Operating procedure

1. Select a POU to authenticate the block password, and click the [Authentication] button.
2. Enter the password in the "Password Authentication" screen, and click the [OK] button.

Deleting a block password

The following shows the procedure for deleting a block password registered to a POU.

Operating procedure

1. Select a POU to delete the block password, and click the [Delete] button.
2. Enter the password in the "Delete Password" screen, and click the [OK] button.

Consideration

For a project whose security version is '2,' the data will be in the unconverted state by registering, changing or deleting a block password.

15.2 Preventing Illegal Access to Programs (Security Key)

To prevent illegal access to a program (in a program file unit) with a key, use the security key authentication function.

Security key authentication function for a project

The operations can be restricted by using a security key.

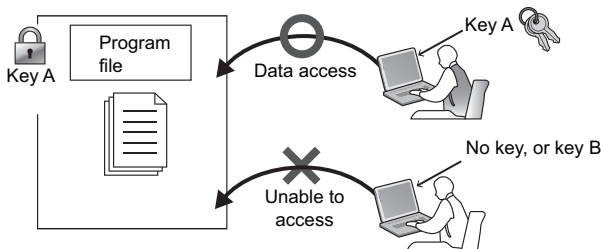
Security key setting target:

| Target | Purpose |
|--|---|
| ■Program files (Program file, FB file, FUN file) (📖 Page 102 Data configuration) A security key can be registered for each program file, however, all program files in a project will be set the same security key. | <ul style="list-style-type: none">• To restrict the access for program files in a project.• To restrict the execution of programs by a CPU module. |
| ■Personal computer Multiple security keys can be registered in one personal computer. | To make the access for program files protected by a security key enabled. |

The following operation can be restricted:

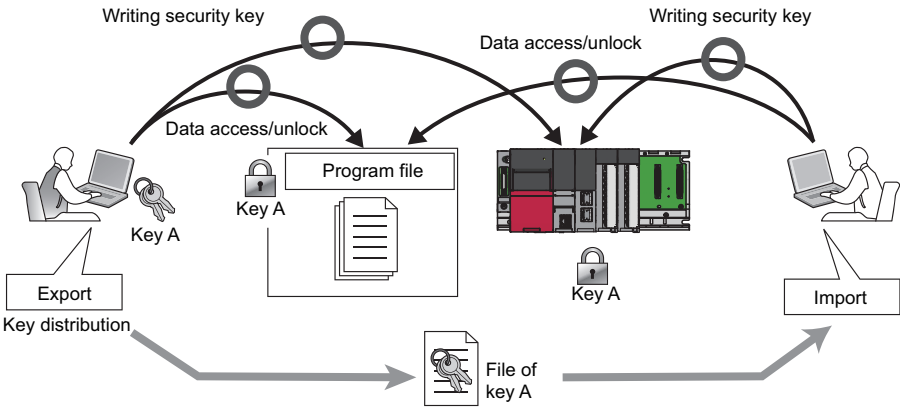
Access to programs (Program file, FB file, FUN file)

The operations are restricted by detecting mismatches of the security key between a program file and personal computer.



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Copy of security key: The security key registered to a personal computer can be copied by exporting/importing it from/to other personal computer. In addition, the expiration date of the security key can be set.



Setting method: 📖 Page 701 Copying a security key

Precautions

The security key registered to a personal computer is not deleted even if GX Works3 is uninstalled. Delete the security key in the "Security Key Management" screen.

Procedure for using the security key authentication function for a project

Procedure for making a security enable

1. Create a security key. (📖 Page 699 Creating/deleting a security key)
2. Register the security key in a program file. (📖 Page 702 Registering a security key in a program file)
3. Save a project. (📖 Page 129 Saving a project)

A personal computer which does not have the same security key as the one registered in the project cannot be accessed.

Procedure for making locked program files accessible

1. Copy the same security key as the protected program file. (📖 Page 701 Exporting a security key)
2. Register the security key in a personal computer from which the program file is to be accessed. (📖 Page 701 Importing a security key)
3. Open the program file. (📖 Page 107 Opening a project)

The program file can be accessed when the security key matches between the program file and the personal computer.

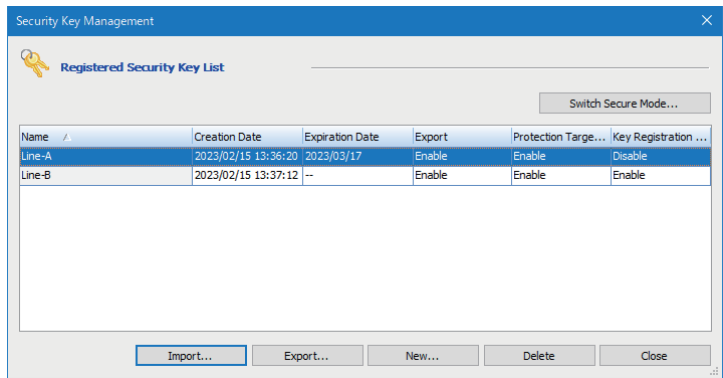
The operations shown above are not required for the personal computer with which a security key is registered in a program file. However, the above operations are required when the security key is deleted.

Creating/deleting a security key

A security key can be created or deleted in the "Security Key Management" screen.

Window

Select [Project] ⇒ [Security] ⇒ [Security Key Management].



Displayed items

| Item | Description |
|-----------------------------|--|
| Creation Date | The date and time when a security key was registered is displayed. |
| Expiration Date | The expiration date that is set when exporting the security key is displayed. |
| Export | Whether re-exporting the security key is enabled/disabled, which was set when exporting the security key, is displayed. |
| Protection Target Selection | Whether selecting data to be protected is enabled/disabled, which was set when exporting the security key, is displayed. |
| Key Registration to CPU | Whether writing data to CPU module is enabled/disabled, which was set when exporting the security key, is displayed. |

15

Secure mode

The following shows the procedure for enabling or disabling the secure mode of a security key.
By enabling the secure mode, the risk for the vulnerability can be reduced.

Operating procedure

1. Confirm that a security key is not registered in a personal computer in advance.
If a security key is registered, delete the key. (☞ Page 700 Deleting a security key)
2. Click the [Switch Secure Mode] button in the "Security Key Management" screen.
3. Enable or disable the secure mode.
4. Click the [OK] button.

Creating a security key

The following shows the procedure for creating a security key and registering it to a personal computer.
Number of security keys that can be registered: The security keys can be created for each logon user. Up to 128 security keys, including the created security keys and the imported ones, can be registered for each logon user.

Operating procedure

1. Click the [New] button.
2. Enter a security key name in the "New Security Key" screen and click the [OK] button.

Precautions

All information can no longer be accessed if the security key that locks a CPU module and project is accidentally deleted or lost.
Set a sufficient validity period for a security key file when exporting, and carefully manage the exported file.

Deleting a security key



The following explains the procedure for deleting a security key that is registered in a personal computer.

If a security key that locks a project is deleted, the locked data in the project can no longer be accessed or edited.

Deactivating a security key is recommended before deleting it.

A security key can be deactivated by deleting it in the "Security Key Setting" screen.

For details, refer to the following:

- To deactivate a security key registered in a program file:  Page 702 Deleting a security key
- To deactivate a security key written in a CPU module:  Page 706 Deleting a security key

After deleting the security key, even when the security key with the same name as the deleted one is recreated, it will not be the same security key as the deleted one. Take extra caution when deleting a security key.

Operating procedure

- 1.** Select a security key to be deleted in the "Security Key Management" screen.
- 2.** Click the [Delete] button.

Copying a security key

A security key can be copied (imported/exported) in the "Security Key Management" screen.

Exporting a security key

The following shows the procedure for exporting a security key registered to a personal computer to a file (*.ity, *.ity2) where the security key can be imported.

An expiration date and restrictions for operations can be added to the security key to be exported.

Operating procedure

1. Select a security key to be exported in the "Security Key Management" screen.
2. Click the [Export] button.
3. Set the following items in the "Export" screen.

| Item | Description |
|-----------------------------|--|
| Restriction | Set whether to add restrictions to the security file to be exported. |
| Expiration Date | Set the expiration date for the security key to be exported. |
| Export | Set whether to allow exporting the security key after importing the exported security key. |
| Protection Target Selection | Set whether to allow registering the security key for the program files using the exported security key. |
| Key Registration to CPU | Select whether to allow writing the security key to the CPU module using the exported security key. |

4. Set the password to be required when importing the security key, and click the [Export] button.

Precautions

- The exported security key files must be managed carefully.
- The security key files created in GX Works3 are not compatible with that of GX Works2.

Point

The extension of a security key file to be exported differs as follows depending on whether the secure mode is enabled or disabled.

- When the secure mode is enabled: *.ity2
- When the secure mode is disabled: *.ity

Importing a security key

The following shows the procedure for importing an exported security key file in a personal computer to register the security key.

Operating procedure

1. Click the [Import] button in the "Security Key Management" screen.
2. Select a file (*.ity, *.ity2) in the "Import Security Key" screen, and click the [Open] button.
3. Enter the password set when exporting the security key in the "Password Authentication" screen, and click the [OK] button.

■Expiration date

- If the expiration date of the security key registered in a personal computer is expired, accessing programs, re-exporting security keys, registering security keys in program files, and writing security keys to CPU module cannot be performed.
- To use the same security key even after the expiration date, export the security key from the exported personal computer again, and import it to the personal computer.

Precautions

A security key file with the '*.ity2' extension can be imported only while the secure mode is enabled.

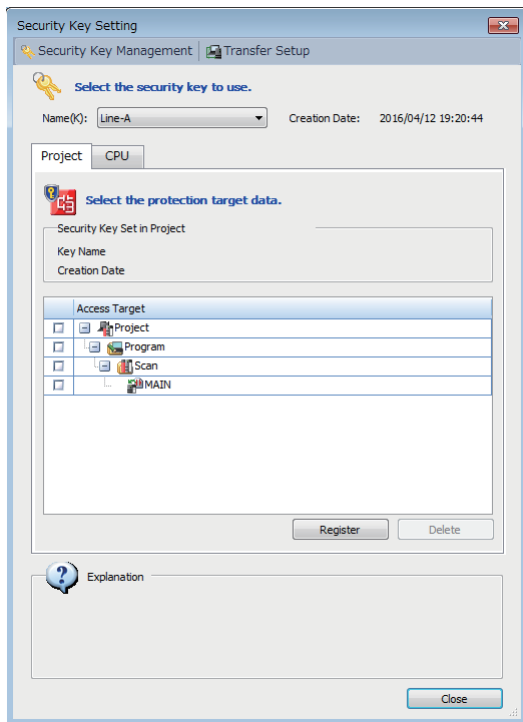
Registering a security key in a program file

A security key must be created in the "Security Key Management" screen in advance.

A security key can be registered for each program file, however, all program files in a project will be set the same security key.

Window

Select [Project] ⇒ [Security] ⇒ [Security Key Setting].



Registering a security key

Operating procedure

1. Select a security key to be registered to a program file from "Name."
2. Select a program file to lock from the [Project] tab, and click the [Register] button.

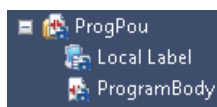
The security key registered to program files will be enabled after saving the project.

When a security key is registered, the icons in the navigation window will be displayed as shown below.

When the security keys between in the personal computer and the project does not match



When the security keys between in the personal computer and the project matches



■Security key lock for a FB file

If a program, in which a function block of FB file locked with a security key is used, is opened on the personal computer with no corresponding security key exists, the FB program cannot be opened.

However, the instances of the locked FB can be created in the program on the personal computer in which the security key is not registered.

Deleting a security key

Operating procedure

Click the [Delete] button in the [Project] tab.

Consideration

For a project whose security version is '2,' the project will be in the unconverted state by clicking the [Register]/[Delete] button in the [Project] tab.

15.3 Preventing Illegal Program Execution (Security Key)

To prevent an illegal execution for programs (STOP/PAUSE → RUN) written in a CPU module, use the security key authentication function.

Security key authentication function for a CPU module

The execution of a program can be restricted by using a security key.

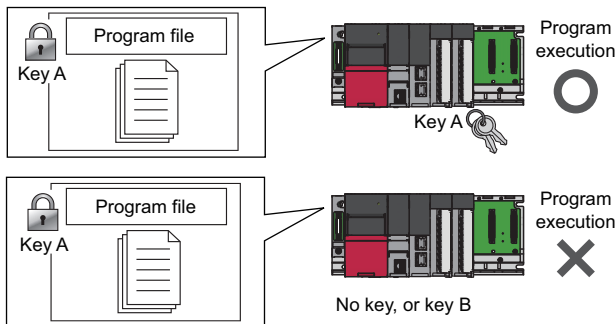
Security key setting target:

| Target | Purpose |
|--|--|
| ■CPU module Only one security key can be written to one CPU module. | To make the execution of a program restricted by a security key enabled. |

The following operation can be restricted:

Execution of programs in CPU module (STOP/PAUSE → RUN)

The operations are restricted by detecting mismatches of the security key between the program file written in a CPU module and CPU module.



The programs are not executed if any of the programs of which security key is unmatched in the CPU module exists.
The security key written in the CPU module is retained after powering OFF.

Procedure for using the security key authentication function for a CPU module

Procedure for making a security enable

1. Create a security key. (📖 Page 699 Creating/deleting a security key)
2. Register the security key in a program file to be written to a CPU module. (📖 Page 702 Registering a security key in a program file)
3. Write the program files to the CPU module. (📖 Page 600 Writing data to a programmable controller)

A CPU module which does not have the same security key as the one registered in the program file cannot execute the programs.

Procedure for making locked programs executable

1. Set the Specify Connection Destination to access to the CPU module. (📖 Page 577 Specification of Connection Destination)
2. Write the same security key as the protected program file to the CPU module. (📖 Page 705 Writing/deleting a security key to/from a CPU module)

The programs can be executed unless otherwise the security key set to the program file or CPU module is changed.

Writing/deleting a security key to/from a CPU module

By writing the same security key as a project to a CPU module, a program can be executed.

A security key can be written to any of the following:

- CPU module
- Cassette (extended SRAM cassette^{*1} or battery-less option cassette^{*2})

^{*1} An extended SRAM cassette cannot be attached to R00CPUs, R01CPUs, R02CPUs, LHCPUs, FX5CPUs, and remote head modules.

^{*2} A battery-less option cassette cannot be attached to R00CPUs, R01CPUs, R02CPUs, RnPCPUs, RnPSFCPUs, RnSFCPUs, LHCPUs, FX5CPUs, and remote head modules.

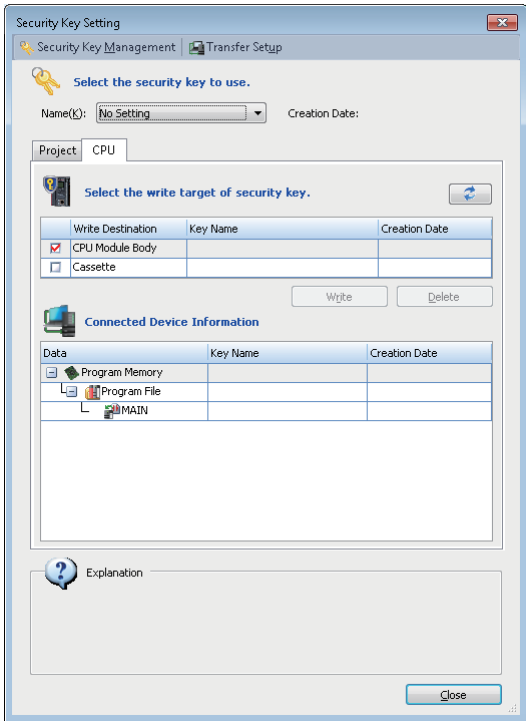
Additionally, one security key can be written to multiple CPU modules.

To write a security key, create a key on the "Security Key Management" screen and connect a personal computer and a CPU module in advance. (Only when a CPU module is in STOP state, a security key can be written and deleted.)

For a safety project, the security key can be written/deleted when the safety operation mode of a CPU module is in the test mode.

Window

Select [Project] ⇒ [Security] ⇒ [Security Key Setting].



Writing security key

Operating procedure

1. Select a security key to be written from "Name."
2. Select a write destination in the [CPU] tab, and click the [Write] button.

■When a security key is written to a cassette

A security key can be succeeded to the replaced CPU module only by replacing a cassette (extended SRAM cassette or battery-less option cassette). Writing the security key from the personal computer in which the security key is registered is unnecessary.

■Write target of a security key in a multiple CPU system

In a multiple CPU system, write a security key to each CPU module. Additionally, the security key set in CPU No.1 can be used in CPU No.2 to CPU No.4.

■Operations when using CPU modules in a redundant system configuration

When "Write to CPUs of both systems" is selected for an RnPCPU (redundant mode), the operations differ depending on the operation modes.

When "Write to CPUs of both systems" is selected for an RnPSFCPU, the module operates in the backup mode.

| Operation mode | Operation |
|----------------|--|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). If an error occurs in the control system during writing, that is not performed to the standby system. If an error occurs in the standby system during writing, the status of control system is not restored to that before changed. |

Deleting a security key

The security key written in a CPU module can be deleted on a personal computer in which the security key is not registered. However, a program of which security key is registered in a CPU module exists, the security key cannot be deleted.

Operating procedure

Select a security key to be deleted from the [CPU] tab, then click the [Delete] button.

15.4 Preventing Illegal Access to a Project (User Authentication)

To prevent an illegal access to a safety project from a user with no authority, use the user authentication function for a project. RnPSFCPU and RnSFCPU support this function.

User authentication function for a project

Operations are restricted by registering a user name/password for a project.

The following operation can be restricted:

User authentication for a project

To access to a project, logging on with the registered user information (user name/password) is required.

Logged-on user



Project



Unlogged-on user



Data access

User information



15

Access level

Access level is an operation privilege that is given to a user who logs on to a project and/or CPU module.

The operations allowed for each access level are as follows.

| Access level | | Operation authority |
|---------------------------|--|---|
| Higher ↑ ↓ Lower | Administrators (Administrator level) | All operations including user management of projects and CPU modules |
| | Developers (Developer level) | Operations except for user management and security setting Writing of data on a standard program and safety program to a CPU module |
| | Assistant Developers (Developer level) | Operations except for user management, security setting, writing of safety programs and parameters Writing of data on a standard program to a CPU module |
| | Users (Operator level) | Referencing of a project and monitoring of CPU modules |

Functions that require user authentication

Depending on an access level, some functions are restricted in a project.

The functions restricted by each access level are as follows.

○: Available, ×: Not available

| Function | Access level | | | |
|---|----------------|------------|----------------------|-------|
| | Administrators | Developers | Assistant Developers | Users |
| Overwriting | ○ | ○ | ○ | × |
| User management | ○ | × | × | × |
| Deleting the user information of a project | ○ | × | × | × |
| Project revision history | ○ | ○ | ○ | × |
| Changing the module type and operation mode | ○ | × | × | × |
| Online program change | ○ | ○ | ○ ^{*1} | × |
| Writing data to a programmable controller | ○ | ○ | ○ ^{*1} | × |

*1 Only data on a standard program can be written to a CPU module. (📖 Page 712 Operation)

Guest user

The 'guest user' has an authority to log on to a project and a CPU module without entering the user name and the password in the "User Authentication" screen. (Its access level is 'Assistant Developers' or 'Users'.)

To log on as a guest user, add a guest user in the "Add New User" screen or enable a guest user in the "User Management" screen.

For details, refer to the following:

📖 Page 106 Adding a new user

📖 Page 709 User management

After the logon, the user can read and edit only standard programs.

Procedure for using the user authentication function for a project

1. Create a safety project, and add a user of Administrators to the project. (📖 Page 105 Creating a project)
2. Add a user who is allowed to operate the project. (📖 Page 709 User management)
3. Save a project. (📖 Page 129 Saving a project)

Once the above procedure has done, logging on is necessary to access to the projects.

Logging on to a project

For a project in which user information is registered, logon is required to perform operations such as opening the project.

Enter a user name and password, that are registered in the project, to log on.

To log on as a guest user, click the [Log on as a GUEST] button on the "User Authentication" screen.

Changing a password of the logon user

The following shows the procedure for changing a password of a user who is logging on to a project.

Operating procedure

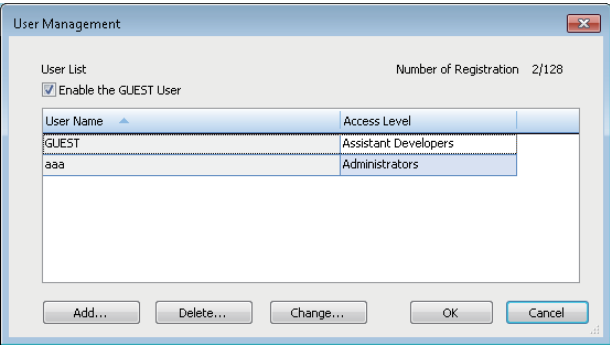
Select [Project] ⇒ [Security] ⇒ [Change User Password].

User management

The following shows the screen for managing the user registration status of a project to which a security is set. A user of Administrators can change all user's passwords.

Window

Select [Project] ⇒ [Security] ⇒ [User Management].



Adding/changing user information

The following shows the procedure for adding/changing user information (user name/password) in a project.

Operating procedure

1. Click the [Add]/[Change] button.
2. Set each item in the "Add New User" screen/"Change User" screen, and click the [OK] button.

Deleting user information

The following shows the procedure for deleting user information registered in a project.

Operating procedure

Select a user name to be deleted, and click the [Delete] button.

Enabling a guest user

By selecting the checkbox of "Enable the GUEST User," the guest user information is displayed in the list. The following table shows whether guest user information is changeable or not.

○: Changeable, ×: Not changeable

| User information | | Change |
|------------------|----------------------|--------|
| Item | Description | |
| User name | GUEST | × |
| Access level | Assistant Developers | ○*1 |
| Password | GUEST1234 | × |

*1 The access level cannot be changed except for 'Assistant Developers' and 'Users.'

15.5 Preventing Illegal Access to a CPU Module (User Authentication)

To prevent an illegal access to the data such as a program or parameters written to a CPU module, use the user authentication function for a CPU module.

RnPSFCPU and RnSFCPU support this function.

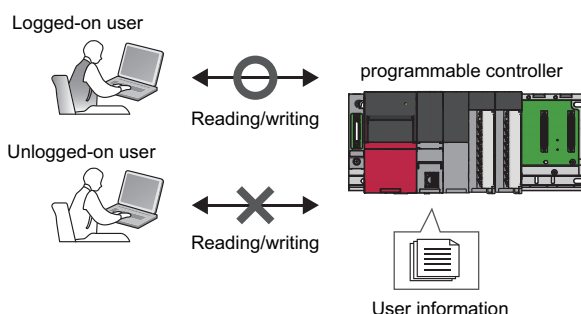
User authentication function for a CPU module

Operations are restricted by registering a user name/password for a CPU module.

The following operation can be restricted:

User authentication for a CPU module

To access to a CPU module, logging on with the registered user information (user name/password) is required.



Point

- The user information registered in a CPU module needs to match with the user information of a project.
- The vulnerability measures are enhanced in RnSFCPU (firmware version 27 or later) and RnPSFCPU (firmware version 12 or later), and the following functions are changed partially:
 - Functions and operations that require user authentication
 - Writing user information to a CPU module
 - Logging on to a CPU module

In addition, the vulnerability measures are also enhanced in GX Works3.

By using an RnSFCPU (firmware version 27 or later) and GX Works3 (version 1.087R or later), or an RnPSFCPU (firmware version 12 or later) and GX Works3 (version 1.105K or later), communication with enhanced vulnerability measures can be performed.

For RnPSFCPU, whether the user authentication function can be executed for both systems (the connective system and the other system) and the other system depends on each function.

○: Executable, —: Not executable

| User authentication function | Both systems | Connective system |
|--|--------------|-------------------|
| Logon to a programmable controller | ○ | ○ |
| Logoff from a programmable controller | ○ | ○ |
| Logoff of all users from a programmable controller | ○ | ○ |
| Password change of a programmable controller | — | ○ |
| User information reading from a programmable controller | — | ○ |
| User information writing to a programmable controller | — | ○ |
| User information copy to a programmable controller in the other system | — | ○ |
| Initializing all information of a programmable controller | — | ○ |

Functions and operations that require user authentication

■Function

Depending on the access level, some functions are restricted in a CPU module.

The functions restricted by each access level are as follows.

For CPU modules that support each function, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

○: Available, ×: Not available

| Function | | Access level | | | |
|---|--|-----------------|-----------------|----------------------|-----------------|
| | | Administrators | Developers | Assistant Developers | Users |
| File operation | Write to PLC | ○ ^{*1} | ○ ^{*1} | ○ ^{*1} | × |
| | Read from PLC | ○ ^{*1} | ○ ^{*1} | ○ ^{*1} | ○ ^{*1} |
| | Verify with PLC | ○ ^{*1} | ○ ^{*1} | ○ ^{*1} | ○ ^{*1} |
| | Delete data in a programmable controller | ○ ^{*1} | ○ ^{*1} | ○ ^{*1} | × |
| Redundant programmable controller operation | Memory copy | ○ ^{*2} | × | × | × |
| CPU memory operation | Data memory initialization | ○ | ○ | × | × |
| | Device/label memory initialization | ○ | ○ | ○ | × |
| | Zero clear of file registers (all files) | ○ | ○ | ○ | × |
| | Zero clear of file registers (file specification) | ○ | ○ | ○ | × |
| | Label memory read/write | ○ | ○ | ○ | ○ |
| Change program | Online program change | ○ | ○ | ○ | × |
| | File batch online change | ○ | ○ | ○ | × |
| Security | Write/delete a security key | ○ | × | × | × |
| | Register/change/delete file password | ○ | × | × | × |
| | Authenticate file password | ○ | ○ | ○ | ○ |
| | Add/delete/change new user | ○ | × | × | × |
| | Read/write user data | ○ | × | × | × |
| | Change user password | ○ | ○ | ○ | ○ |
| Diagnostics | All clear event history | ○ | ○ | × | × |
| Test | Register device test with execution conditions | ○ ^{*3} | ○ ^{*3} | ○ ^{*3} | ○ ^{*3} |
| Safety | Safety operation mode switching | ○ | ○ | × | × |
| | Identification check for safety data | ○ ^{*4} | ○ ^{*4} | ○ ^{*4} | ○ ^{*4} |
| User authentication | Logoff from a programmable controller | ○ ^{*2} | ○ ^{*2} | ○ ^{*2} | ○ ^{*2} |
| | Logoff of all users from a programmable controller | ○ ^{*2} | × | × | × |
| | User information copy to a programmable controller in the other system | ○ ^{*2} | × | × | × |
| Operation | FB property management (online) | ○ | ○ | ○ | ○ |

*1 User authentication is not required to write/read a device memory (except for the file register).

*2 Only RnPSFCPU support it.

*3 User authentication is required for changing values of the following devices and labels.

- Local device
- Local label
- Index register
- Index-modified device

*4 Available only when using GX Works3 and an RnSFCPU/RnPSFCPU in the following version combinations: GX Works3 Version 1.087R or later and an RnSFCPU with the firmware version 27 or later, or GX Works3 Version 1.105K or later and an RnPSFCPU with the firmware version 12 or later.

■Operation

Depending on the access level, the operations (read, write, delete, verify) that can be performed for data in a CPU module differ.





The operations restricted by each access level are as follows.

○: Available, ×: Not available

| Data | Administrators | Developers | Assistant Developers | | Users | |
|--|--------------------------|------------|----------------------|--------------|-----------------|--------------|
| | Read/Write/Delete/Verify | | Read/Verify | Write/Delete | Read/Verify | Write/Delete |
| Sequence program | ○ | | ○ | ○ | ○ | × |
| Safety sequence program | ○ | | ○ | × | ○ | × |
| FB file | ○ | | ○ | ○ | ○ | × |
| Safety FB file | ○ | | ○ | × | ○ | × |
| CPU parameter | ○ | | ○ | × | ○ | × |
| Safety CPU parameter | ○ | | ○ | × | ○ | × |
| System parameter | ○ | | ○ | × | ○ | × |
| Module parameter | ○ | | ○ | × | ○ | × |
| Safety module parameter | ○ | | ○ | × | ○ | × |
| Module extended parameter | ○ ^{*1} | | ○ ^{*1} | × | ○ ^{*1} | × |
| Memory card parameter | ○ | | ○ | × | ○ | × |
| Device comment | ○ | | ○ | ○ | ○ | × |
| Initial device value | ○ | | ○ | ○ | ○ | × |
| Global label setting file | ○ | | ○ | ○ | ○ | × |
| Safety global label setting file | ○ | | ○ | × | ○ | × |
| Standard/safety shared label setting file | ○ | | ○ | × | ○ | × |
| Initial global label value | ○ | | ○ | ○ | ○ | × |
| Initial local label value | ○ | | ○ | ○ | ○ | × |
| Global label assignment information file for an access from an external device | ○ | | ○ | ○ | ○ | × |
| File register | ○ | | ○ | ○ | ○ | × |
| Remote password file | ○ | | ○ | × | ○ | × |
| Device memory | ○ | | ○ | ○ | ○ | × |
| Parameter of a device station | ○ | | ○ | ○ | ○ | ○ |
| Parameter of a safety device station | ○ | | ○ | ○ | ○ | ○ |
| Recording setting file | ○ | | ○ | ○ | ○ | ○ |
| Module-specific backup parameter | ○ | | ○ | × | ○ | × |

*1 For some modules, module extended parameters can be read or written only in their own configuration tools.

Procedure for using the user authentication function for a CPU module

1. Register the user information in the project which is to be written to a CPU module. ( Page 709 User management)
2. Write the user information to a CPU module. ( Page 713 Writing user information to a CPU module)
3. For RnPSFCPU, copy the user information to the other system. ( Page 716 Copying user information to the other system)
4. Write programmable controller data to a CPU module. ( Page 600 Writing data to a programmable controller)

Once this procedure has done, logging on is required to access to the CPU module in advance.

Writing user information to a CPU module

The following shows the procedure for writing user information registered in a project to a CPU module.

By writing user information to a CPU module for the first time, the user authentication of a programmable controller is enabled.

Operating procedure

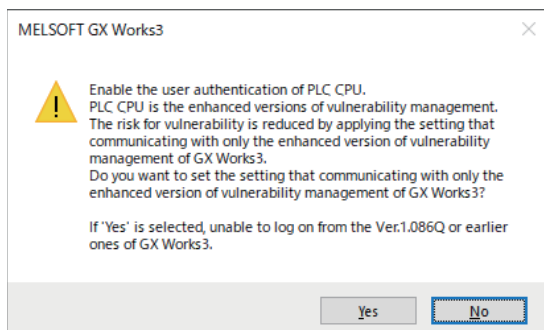
Select [Online] ⇒ [User Authentication] ⇒ [Write User Information to PLC].

Communication with enhanced vulnerability measures

When writing user information while using a CPU module and GX Works3 in which vulnerability measures are enhanced, the confirmation screen to enable the setting to communicate with only GX Works3 with enhanced security measures appears. By clicking the [Yes] button in the screen, communication with enhanced vulnerability measures can be performed, and the risk for the vulnerability can be reduced.

Ex.


When using an RnSFCPU (firmware version 27 or later) in which vulnerability measures are enhanced



The following shows the combinations of CPU modules and GX Works3 in which vulnerability measures are enhanced.

- RnSFCPU (firmware version 27 or later) and GX Works3 (version 1.087R or later)
- RnPSFCPU (firmware version 12 or later) and GX Works3 (version 1.105K or later)

For RnPSFCPU, to communicate with enhanced vulnerability measures, perform either of the following operations after enabling the setting for the CPU module in the connective system:

- Copy user information from the CPU module in the connective system to the CPU module in the other system. ( Page 716 Copying user information to the other system)
- Write user information by selecting the other system in the "Specify Connection Destination" screen.

Reading user information from a CPU module

The following shows the procedure for reading the user information registered in a CPU module and overwriting the existing project.

Operating procedure

Select [Online] ⇒ [User Authentication] ⇒ [Read User Information from PLC].

Precautions

When reading user information from a CPU module to GX Works3 Version 1.044W or earlier, the access label "Assistant Developers" is changed to "Users."

Logging on to a CPU module

Logging on is required to access to a CPU module in which the user information is registered.

Enter a user name and password, that are registered in a CPU module, to log on.

For RnPSFCPU, users can log on to both systems or the connective system.

After logging on, the user is automatically logged off if the CPU module has no access within the logoff judgment time or user information are written.

Operating procedure

1. Select [Online] ⇒ [User Authentication] ⇒ [Log on to PLC]
 2. Set each item in the "User Authentication" screen and click the [OK] button.
- To log on as a guest user, click the [Log on as a GUEST] button on the "User Authentication" screen.

Precautions

- If password authentication fails for a certain number of times, it is rejected (locked out) for a fixed period of time. In RnSFCPU (firmware version 27 or later) or RnPSFCPU (firmware version 12 or later) in which the vulnerability measures are enhanced, it is locked out for 60 minutes when input error exceeds five times.
- Users may not be able to log on to a CPU module from GX Works3 with the following combinations:
 - RnSFCPU (firmware version 27 or later) with enhanced vulnerability measures and GX Works3 (Version 1.086Q or earlier) in which the vulnerability measures are not enhanced
 - RnPSFCPU (firmware version 12 or later) with enhanced vulnerability measures and GX Works3 (Version 1.105K or earlier) in which the vulnerability measures are not enhanced

In this case, check the error code and take corrective actions. For details on error codes, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

■ When a user name and a password used in the user authentication function are lost

Initialize the user information, the programmable controller data, and the security keys in the CPU module by performing the following operation.

- Select [Online] ⇒ [User Authentication] ⇒ [Initialize all PLC Data]

Rewrite the user information, the programmable controller data, and security keys (optional) to the CPU module after initialization.

If the power of the CPU is turned OFF and ON or the CPU module was reset, the allocation for the device/label memory is back to the initial status. (Each area has the default capacity.)

Changing a password

The following shows the procedure for changing a password for a CPU module to the one set to a project.

Operating procedure

Select [Online] ⇒ [User Authentication] ⇒ [Change the Password of PLC]

Authentication destination setting in the online function

The following shows the procedure for selecting either both systems or the connective system as the target of user authentication when performing the online function.

Only RnPSFCPU support it.

Operating procedure

Select [Online] ⇒ [User Authentication] ⇒ [Authentication Destination] ⇒ [Both Systems]/[Connective System].

Logging off from a CPU module

The following shows the procedure for logging off from a logged on CPU module.

Only RnPSFCPU support it.

Users can log off from both systems or the connective system.

Logging off

The following shows the procedure for logging off from a logged on CPU module.

Operating procedure

Select [Online] ⇒ [User Authentication] ⇒ [Log off from PLC].

Logging off all users

The following shows the procedure for logging off all users from a logged on CPU module.

Operating procedure

Select [Online] ⇒ [User Authentication] ⇒ [Log off All Users from PLC].

Copying user information to the other system

The following shows the procedure for copying user information from the CPU module in the connective system to the CPU module in the other system.

Only RnPSFCPU support it.

Operating procedure

Select [Online] ⇒ [User Authentication] ⇒ [Copy User Information to Other System PLC].

15.6 Preventing Illegal Data Reading/Writing (File Password)

To prevent files in a CPU module or SD memory card from being illegally reading and writing, use the file password function.

File password function

By using this function to register a password for a file in a CPU module or SD memory card, the file reading and writing can be prohibited.

It is possible to prohibit either file reading or writing, or both.

File

The following table shows the files for which the passwords can be registered.

○: Available, ×: Not available

| File name | Availability |
|---|--------------|
| System parameter, CPU parameter, module parameter, module extended parameter, memory card parameter | ○ |
| Remote password | × |
| Global label setting | ○ |
| Global label assignment information | × |
| Initial global label value | × |
| Initial local label value | × |
| Program file | ○ |
| POU (FB file/FUN file) | ○ |
| File register | × |
| Initial device value | ○ |
| Common device comment | ○ |
| Each program device comment | ○ |
| Firmware update prohibited file | ○*1 |
| Faulty database check file | × |
| System file for backing up CPU module data | × |
| Backup data file for backing up CPU module data | × |
| Device/label data file for backing up CPU module data | × |
| System file for the iQ Sensor Solution data backup/restoration function | × |
| Backup data file for the iQ Sensor Solution data backup/restoration function | × |
| ODBC server setting file | × |
| Database path file | × |

*1 A password cannot be registered for a file in an SD memory card inserted in a personal computer.

Password authentication

By registering a password for a file, password authentication is required when performing an online operation.

The following table shows the online operations requiring password authentication.

○: Required, —: Not required



| Online operation | Applicability | Password to be set |
|---|---------------|---|
| Reading data from a programmable controller | ○ | Read-protected password |
| Writing data to a programmable controller | ○ | Write-protected password |
| Performing online change (Online program change, file batch online change) | ○ | Write-protected password |
| Verifying data with a programmable controller | ○ | Read-protected password |
| Setting a file password (registration/change/authentication/deletion) | ○ | Read-protected password, write-protected password |
| Deleting data in a programmable controller | ○ | Write-protected password |
| Operating CPU memory (initialization) | — | — |

Precautions

If password authentication fails for a certain number of times, it is rejected (locked out) for a fixed period of time.


Access from an external device

Password authentication is required when accessing a file with a password in an RCPUC by using a function other than one in GX Works3 such as the FTP server function or MC protocol. For details, refer to the following:

| Function | Reference |
|-------------|--|
| FTP server |  MELSEC iQ-R Ethernet User's Manual (Application) |
| MC protocol |  MELSEC iQ-R Serial Communication Module User's Manual(Application) |

Considerations

- Keep passwords safe.



When the registered password is lost or the protection of a file to which "Permanent PLC Lock" is set is need to be released, initialize the CPU module ( Page 799 Checking Memory Usage) and write the project newly to the CPU module.

Procedure for using the file password function

Procedure for making a security enable

■CPU module/SD memory card inserted in a CPU module

Operating procedure

1. Connect a personal computer and a CPU module. ( Page 577 Specification of Connection Destination)
2. Register a password for a file. ( Page 720 Setting a file password)

■SD memory card inserted in a personal computer



Operating procedure

Register a password for a file. ( Page 720 Setting a file password)

Procedure for making a locked file readable/writable

■CPU module/SD memory card inserted in a CPU module

Operating procedure

1. Connect a personal computer and a CPU module. ( Page 577 Specification of Connection Destination)
2. Obtaining the authentication of the password registered for a file. ( Page 720 Setting a file password)

■SD memory card inserted in a personal computer

Operating procedure

Obtaining the authentication of the password registered for a file. ( Page 720 Setting a file password)

Setting a file password

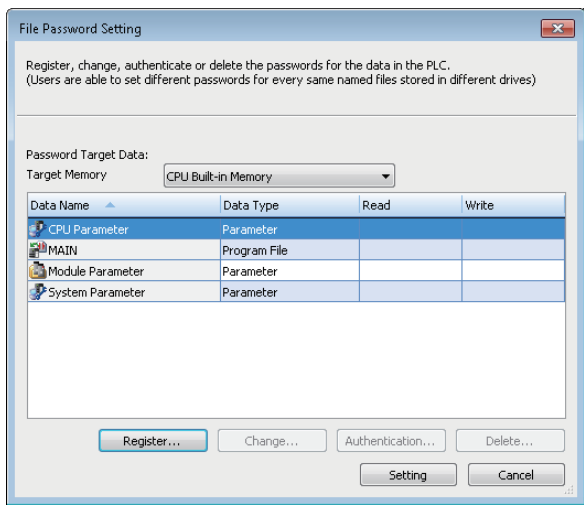
The following operations, password registration, change, authentication, and deletion, can be performed for a file.

| Operation | Description |
|----------------|--|
| Registration | To register a password for a file to prohibit reading and/or writing. A password registered for a file in the transfer source memory during the boot operation is registered for the file in the file transfer destination memory. A password registered for a file is applied after closing and reopening the project including the file. |
| Change | To change the password registered for a file. |
| Authentication | To obtain a password authentication for a file and release the protection of the file temporarily. After password authentication, the file can be read or written until the project is closed. A password can also be authenticated in the "File Password Setting" screen displayed when accessing a file with a password. |
| Deletion | To delete the password registered for a file. |

Window

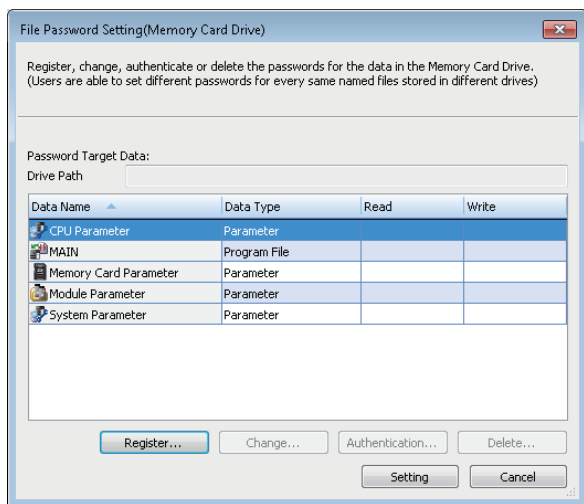
■CPU module/SD memory card inserted in a CPU module

Select [Project] ⇒ [Security] ⇒ [File Password Setting].



■SD memory card inserted in a personal computer

Select [Setting] on the "Memory Card Operation" screen ⇒ [File Password Setting].



Operating procedure

1. Select a file and click the [Register]/[Change]/[Authentication]/[Delete] button.
2. Set each item in the displayed screen and click the [Completed] button.
3. Click the [Setting] button in the "File Password Setting" screen.

■Protection that cannot be released (FX5CPU)

For a file in an FX5CPU, reading and writing can be prohibited without registering a password. However, the protection cannot be released after prohibiting the operations.

To set the protection, select the checkbox of "Permanent PLC Lock" in the "Register Password" screen.

For applicable files, refer to the following:

 Page 717 File

Precautions

- When a project for an FX5CPU is opened, the password cannot be registered for a file in an SD memory card inserted in a personal computer. In addition, changing or deleting a password and obtaining a password authentication cannot also be performed.
- To register a password for a file in a CPU module or an SD memory card inserted in a CPU module, connect a personal computer and CPU module in advance.
- Operation that can be performed depends on the safety operation mode of a CPU module.
Test mode: All operations
Safety mode: Authentication only
- Both reading and writing can be prohibited for a file by selecting the checkbox of "Permanent PLC Lock" However, if the prohibition has already been set for either one operation, the other one cannot be prohibited later.

15.7 Preventing Illegal Access to/Falsification of Data (Security Version)

To prevent an illegal access and falsification to/of the data in a project, use a security version.

Security version

There are two types of security versions: "1" or "2."

A project password can be registered by setting a security version to "2." By registering a project password, operations can be restricted for a project and the data in a CPU module.

In addition, by setting the security mode to "2," whether the data is falsified can be checked automatically when operating the data.


Project authentication

The project password authentication is required when performing an operation or function for the following:

- A project in which a security version is set to "2"
- Data written to a programmable controller from a project in which a security version is set to "2"

The following table shows the target functions and operations:


| Function/operation | Remarks |
|--|--|
| Opening a project | — |
| Project verification | |
| Reading data from a programmable controller | |
| Verifying data with a programmable controller | |
| Reading data from an SD memory card | |
| Utilizing system parameters | |
| Utilizing module parameters (safety communication setting) | |
| Reading a recording file | When reading a recording file, the confirmation screen appears if the checkbox of "Read Project Data" is selected in the "Recording File Reading" screen. |
| Starting offline monitoring | When monitoring a recording file, the authentication screen appears if a project whose security version is '2' is opened. |
| Project version management | When acquiring a project, the authentication screen appears. The authentication screen also appears if the latest project password does not exist in a local project. |

A project password can be registered when setting a security version of a project to "2." ( Page 723 When changing a security version from "1" to "2")

Library operation

When the security version of a project in which a library file is created is '2,' authentication of a project password for a library is required in the following operations:

| Library operation | Remarks |
|--|--|
| Registering a library to the library list | — |
| Editing a library | Authentication is required for both a project password for a library and that for a project. |
| Updating the display information in the library list | The authentication screen appears only when a project password for a library has not been authenticated. |
| Updating a library POU | |
| Expanding a library POU | |
| Searching for a library POU | |

A project password for a library can be registered when creating a library file. ( Page 528 Creating a library file)

Procedure for using a security version

When changing a security version from "1" to "2"

1. Select a project in the navigation window, then select [Project] ⇒ [Data Operation] ⇒ [Properties] (🔑), or right-click it and select [Properties] (🔑) from the shortcut menu.
2. Select "2" for "Security Version" in "Security," and click the [OK] button.
3. Read the displayed message, and click the [Yes] button.
4. Set an administrator password and project password in the "Register Password" screen, then click the [OK] button.

Point

An administrator password is required in the following cases:

- When changing the security version from '2' to '1'
- When changing the project password

When changing a security version from "2" to "1"

1. Select a project in the navigation window, then select [Project] ⇒ [Data Operation] ⇒ [Properties] (🔑), or right-click it and select [Properties] (🔑) from the shortcut menu.
2. Select "1" for "Security Version" in "Security," and click the [OK] button.
3. Read the displayed message, and click the [Yes] button.
4. Enter an administrator password in the "Administrator Authentication" screen, then click the [OK] button.

15

When changing an administrator password/project password

1. Select a project in the navigation window, then select [Project] ⇒ [Data Operation] ⇒ [Properties] (🔑), or right-click it and select [Properties] (🔑) from the shortcut menu.
2. Click the [Change Password] button of a password to be changed in "Security."
3. Enter a password in the "Change Administrator Password" screen/"Change Project Password" screen, then click the [OK] button.

Considerations

■Changing a security version and project password

If a security version and project password are changed, a project will be in the unconverted state.

■Other MELSOFT products

For a project whose security version is '2,' some functions may not be used depending on the version of the following MELSOFT products:

- Motion control setting function
- MELSOFT Navigator
- iQ AppPortal
- GT Designer3
- GENESIS64
- CPU Module Logging Configuration Tool
- GX LogViewer

For details, refer to the manuals or Help of each product.

15.8 Restricting Access from Other Than Specific Communication Route (Remote Password)

To restrict the access from other than specific communication route, use the Remote password function.

Remote password function



When accessing a CPU module via any of the following modules, by setting a password for each communication route, access to the CPU module from an external device without password authentication can be prohibited.

- Ethernet interface module (RJ71EN71)
- Serial communication module
- Built-in Ethernet CPU module
- CC-Link IE TSN module
- CC-Link IE TSN Plus master/local module

For the modules that support remote password setting and details on the remote password setting, refer to the user's manual used.

Procedure for using the remote password function



Procedure for making a security enable

1. Set a remote password. ( Page 725 Setting a remote password)
2. Specify "Remote Password" and write the data to a CPU module. ( Page 600 Writing data to a programmable controller)

The access to the CPU module is restricted.

Procedure for accessing a locked CPU module

When accessing a CPU module, a password is required. The CPU module can be accessed when the entered password is correct.

1. Access a CPU module (such as writing or reading data to/from a CPU module). ( Page 600 Writing data to a programmable controller, Page 609 Reading data from a programmable controller)
2. Unlock a remote password by following the displayed message. ( Page 725 Setting a remote password)

When the entered password is correct, the CPU module can be accessed.

Setting a remote password

A remote password can be set for up to 8 modules. (Up to 8 CPU modules for a multiple CPU configuration)

Window

Select "Parameter" ⇒ "Remote Password" in the navigation window.

Operating procedure

1. Click the [Password] button.
2. Set each item in the "Register Password" screen and click the [OK] button.

| Item | Description |
|-------------------|--|
| Product Name | <p>Select the module of which remote connection is to be enabled.</p> <p>For CPU modules integrated network module (such as RnENCPU), select the following to use the CPU part and the network part as a separate module.</p> <ul style="list-style-type: none"> • CPU part: CPU Module (Built-in Ethernet Function) • Network part: CC-Link IE Built-in Ethernet I/F Module |
| Start I/O No.*1 | Enter the start I/O number*1. (The specification using module labels is applicable.) |
| Module conditions | Set the remote password to enable/disable for the user connection number or system connection. |

*1 For FX5CPU, "Intelligent Module No." is displayed.

16 MODULE DIAGNOSTICS

This function displays the status of modules, networks, and entire system. At the time of error, it displays the error contents and the corrective action.

The diagnostics functions of GX Works3 are as follows:

| Function | Reference |
|-----------------------|--|
| System monitor | Page 727 Module Status Check of a System |
| Sensor/device monitor | Page 730 Sensor/Device Status Check |
| Recording monitor | Page 732 Recording Status Check |
| Module diagnostics | Page 733 Module Diagnostics |
| Network diagnostics | Page 739 Ethernet diagnostics |
| | Page 740 CC-Link IE Controller Network diagnostics |
| | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | Page 744 CC-Link IE Field Network Basic diagnostics |
| | Page 745 MELSECNET diagnostics |
| | Page 746 CC-Link diagnostics |
| | Page 748 Simple CPU communication diagnostics |

16.1 Module Status Check of a System

The system monitor function displays the module configuration of the system in operation and detailed information of each module.

In addition, the error status can be checked and the module in which the error occurred can be diagnosed.

Window

Select [Diagnostics] ⇒ [System Monitor].

Ex.
RCPU

■Display setting

Click the [Display Setting] button for the following operations:

- Displaying the network information and IP address of port 2 of a module having two ports
- Switching the display format of an error code

■Contents not displayed

Some contents are not displayed depending on the module series. The following table shows undisplayed contents for each series.

| Series | Contents not displayed |
|-------------------------------------|--|
| MELSEC-Q, MELSEC-L, and MELSEC-iQ-L | Module name of a power supply module |
| MELSEC-Q | Network information and IP address of each module |
| MELSEC-L | Control CPU, port 1 IP address, port 2 network information, and port 2 IP address of each module |
| MELSEC-iQ-L | Control CPU, port 2 network information, and port 2 IP address of each module |

■When '?' appears on the image of a module

'?' appears on the image of a module when the connected module is in the following statuses.

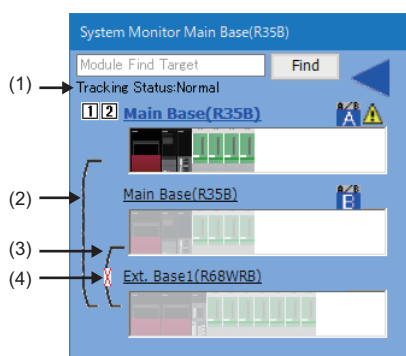
- A connected module is broken.
- The mounting status differs from the I/O assignment setting of the system parameter.
- The control CPU is not mounted.
- A profile is not registered.

For the following modules, '?' may appear on their images depending on their operating statuses:

- MELSEC-Q series module used in a MELSEC iQ-R series system
- MELSEC-L series module used in a MELSEC iQ-L series system

■Redundant system configuration

When a CPU module in a redundant system configuration is used, the following items are displayed in the base unit configuration.



| No. | Item | Description |
|-----|--|--|
| (1) | Tracking Status | Any of the following statuses is displayed: <ul style="list-style-type: none"> • Normal • Error • Copying memory • Copying memory completed • Failed to copy memory |
| (2) | Extension cables (connection routes)*1 | The extension cable connected to 'IN1' of a redundant extension base unit is displayed. |
| (3) | | The extension cable connected to 'IN2' of a redundant extension base unit is displayed. |
| (4) | Connection status*1 | The connection status of an extension cable is displayed as follows: <ul style="list-style-type: none"> • Solid line: active • Dotted line: not active • × : error |

*1 Displayed only when a redundant extension base unit and main base unit are connected with extension cables.

Point

When a redundant extension base unit is used, the connection routes of extension cables connected to the base unit and their status can be displayed in the "Product Information List" screen by clicking the [Product Information List] button.

Precautions

- If the number of extension base units is set incorrectly, the base unit configuration will not be displayed in the order of the connection.
- For a CPU module in a redundant system configuration, the connected destination is switched at the time of selecting a base unit, which is used for the other system, regardless of the contents in the connection destination setting. Therefore, if the other system is selected in the system monitor, functions that are not supported by the other system cannot start.
- If a redundant extension base unit is not connected to a main base unit when the power of a CPU module is turned ON, the base unit will not be displayed.
- If communication with a redundant extension base unit cannot be established when the power of a CPU module is turned ON, the base unit will be displayed as unmounted module. In addition, (Unit/Base Access Error) will be displayed for an unmounted module only when a personal computer is connected to a CPU module in the control system.

Automatic diagnostics function

This function starts up the system monitor function automatically when connecting CPU module and a personal computer by USB connection.

Set whether to start up automatically on the task tray.

FX5UCPUs and FX5UCCPUs do not support this function.

Check of the module firmware version and product information

The firmware version and product information can be checked in the "Product Information List" screen which is displayed after [Product Information List] button is clicked.

File creation function

Information displayed on the system monitor can be output to a CSV file.

Check of the specification method for a network No., station No., and IP address

Whether the IP address change function is used for a network number, station number, and IP address can be checked on the tooltip.

The tooltip appears by placing the mouse cursor on each item in the "Network Information" and "IP Address" columns.

For details on the IP address change function, refer to the following:

 MELSEC iQ-R Ethernet User's Manual (Application)

16.2 Sensor/Device Status Check

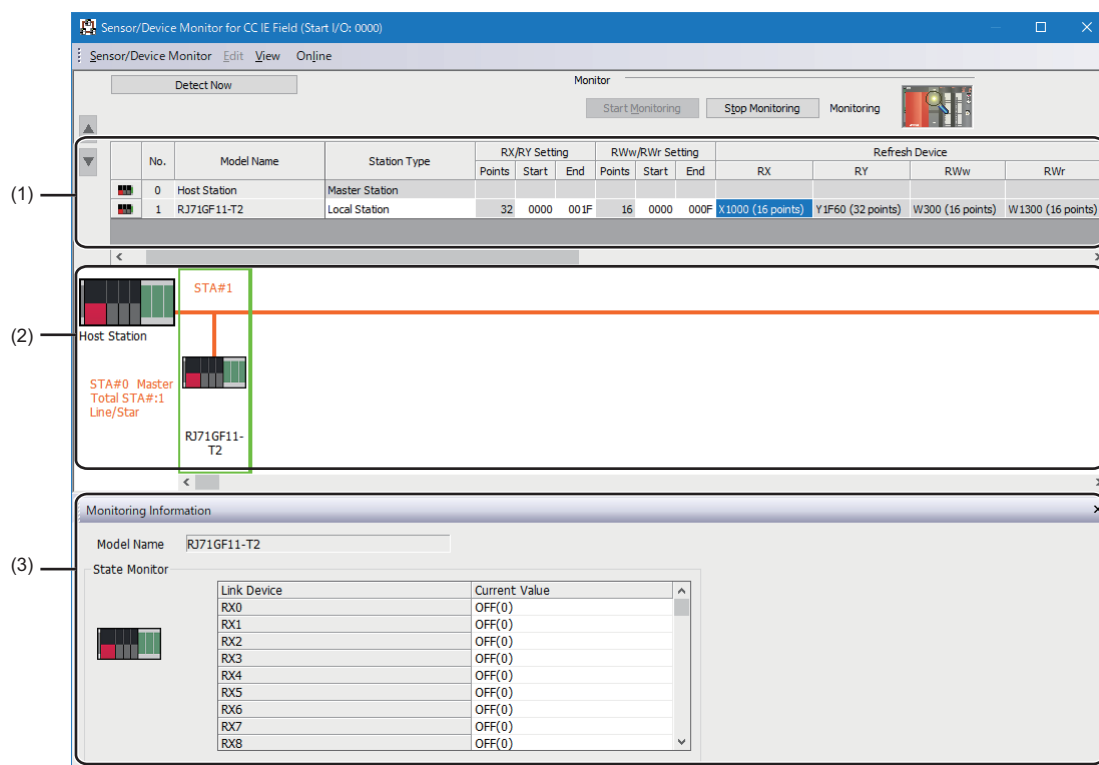
The status and the current value of a sensor/device connected to a network can be displayed.

Supported network: Ethernet (CPU module), AnyWireASLINK, CC-Link IE Field Network, CC-Link

Window

1. Select [Diagnostics] ⇒ [Sensor/Device Monitor].
2. Select a master module or master station in the "Module Selection (Sensor/Device Monitor)" screen, and click the [OK] button.

The following image is a screen example displayed when selecting a master station in CC-Link IE Field Network.



Operating procedure

Select a target device supporting iQSS to be monitored in the list of stations (1) or the device map area (2) of the sensor/device monitor screen.

The status of a selected device supporting iQSS is displayed in the "Monitoring Information" window (3).

Point

- Check the error status of a device supporting iQSS by using the network diagnostics function.
- The sensor/device monitor function reads a large volume of information from a CPU module at once. Therefore, the processing speed of the sensor/device monitor function may decrease depending on the set communication route.

Precautions

When a MELSEC-Q/L series network module is included in a communication route, the sensor/device monitor function cannot be started for the following modules:

- Built-in Ethernet CPU
- CC-Link IE Field Network module

Checking the status of a sensor/device connected to a bridge module

To check the status of a sensor/device connected to a CC-Link IE TSN-AnyWireASLINK bridge module, the sensor/device monitor screen can be displayed by the following procedure:

FX5CPUs do not support this screen.

Operating procedure


1. Select [Diagnostics] ⇒ [CC-Link IE TSN/CC-Link IE Field Diagnostics].
2. Select a CC-Link IE TSN-AnyWireASLINK bridge module in the "CC-Link IE TSN/CC-Link IE Field Diagnostics" screen.
3. Right-click it, and select [AnyWireASLINK Sensor/Device Monitor] from the shortcut menu.

For details, refer to the following:

 iQ Sensor Solution Reference Manual

16.3 Recording Status Check

The operating status of the recording function can be displayed.
In addition, data can be collected and saved as a recording file by using the recording function.
For details, refer to the following:

 MELSEC iQ-R System Recorder User's Manual (Application)
RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU), RnENCPUs, and RnSF CPUs support this monitoring.

Window

Select [Diagnostics] ⇒ [Recording Monitor].

Recording Monitor

Monitoring

Stop Monitoring

Recording Status

| Setting No. | Status | Error (Latest) | Saving Period [s] | Maximum Saving Period (Estimate) [s] | Detail |
|-------------|---------|----------------|-------------------|--------------------------------------|--------|
| 1 | Stopped | No Error | - | - | ... |
| 2 | Stopped | No Error | - | - | ... |
| 3 | Stopped | No Error | - | - | ... |
| 4 | Stopped | No Error | - | - | ... |

- The detailed information regarding the trigger, accumulation, and saving can be checked in [Detail].

- The maximum saving period (estimate) is the standard value calculated with the cumulative size (average) in [Detail] and the sampling interval (average). Each content can be checked in [Detail].

Operation

The following operations are performed on the selected line setting.

Start/Stop Operation

Start

Stop

File saving

Execution

Camera monitor

Monitors the status of the camera set as the receiving target in the video data receiving target settings.

Execution

Close

16.4 Module Diagnostics

This section explains the method for displaying the module status and the error information.

When using an FX5CPU, the FX5CPU and the following modules can be diagnosed.

- FX5-20PG-P, FX5-20PG-D, FX5-ENET, FX5-ENET/IP, FX5-CCLGN-MS, FX5-SF-MU4T5, FX5-SSC-G(S), FX5-OPC

When using an LHCPU, the following modules cannot be diagnosed.

- L6EXB, L6EXE, L6EC, L6EC-ET

Window

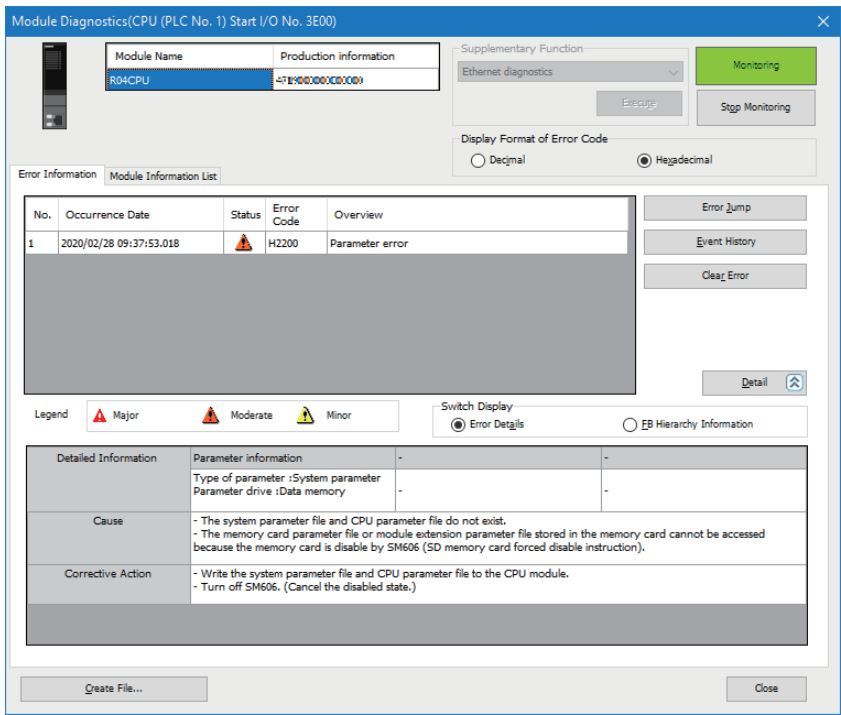
■CPU module and remote head module diagnostics

Select [Diagnostics] ⇒ [Module Diagnostics (CPU Diagnostics)].

In both a CPU module and a remote head module in a redundant system configuration, a module specified as the current connection destination is diagnosed. When diagnosing the other system, change the connection destination or specify the module to diagnose on the system monitor.

■I/O module and intelligent function module diagnostics

Select the module to be diagnosed from the module configuration of the "System Monitor" screen and double-click one of the cells on the same column to display the "Module Diagnostics" screen.



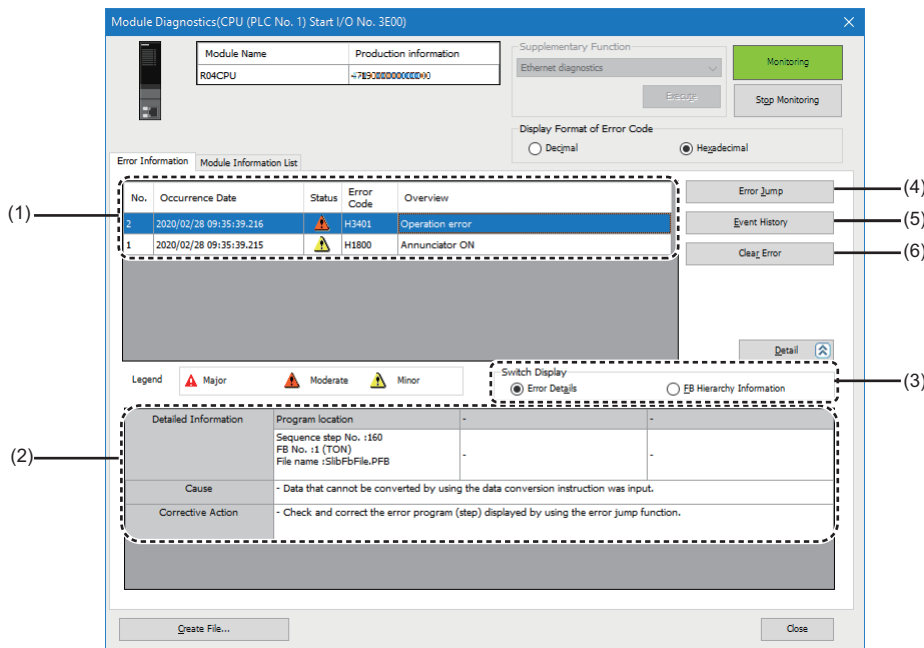
Precautions

Monitoring stops if a program in the project is converted. When the conversion completed, the monitoring resumes.

Error information

Information of errors registered in a diagnostics target module is displayed in the [Error Information] tab.

Window



Displayed items

| Item | | Description |
|----------------------------|--------------------------|--|
| (1) Error list | | Current error information is displayed in a list. Displayed error information differs depending on the module. • CPU module: Information of up to 16 current errors are displayed in the order of occurrence. The one of the 17th and succeeding errors are not displayed.*1 • Other than CPU module: Information of up to 16 most recent current errors are displayed. |
| (2) Detailed information | | Detailed information of an error selected in the error list is displayed. Displayed contents are switched according to the item selected in the "Switch Display." |
| (3) Switch Display*2 | Error Details | Select this to display the detailed information, cause, and corrective action on the error in the detailed information field. (Page 735 Error detailed information) |
| | FB Hierarchy Information | Select this to display the FB hierarchy information of the function block with the error in the detailed information field. (Page 736 FB hierarchy information) |
| (4) [Error Jump] button | | Click this to jump to the following locations (Page 738 Error jump): • Location in which the error selected in the error list or the detailed information field (Error Details) has occurred • Jump destination of the row selected in the detailed information field (FB Hierarchy Information) |
| (5) [Event History] button | | Click this to display the error information and operation history of the module, and the system information history. (Page 749 Error History/Operation History Check) |
| (6) [Error Clear] button | | Click this to clear all the current errors in a batch. In addition, the error information is deleted from the error list.*3 If all the errors are cleared, an LED indicating the error status, which is on the front of the module, turns OFF. |

*1 For a MELSEC-Q/L series module, '-' is displayed in "Occurrence Date," "Status," and "Detailed Information."

*2 Displayed only when diagnosing an RnCPU, an RnENCPU, or an RnPCPU.

*3 For a MELSEC-L series module, error information cannot be deleted.

Precautions

- The occurrence date depends on the time zone selected in "Clock Related Setting" of "Operation Related Setting" of "CPU parameter." Therefore, the time shown in the screen may be different from the one on the personal computer in use.
- If a same error with error code has occurred which has already been displayed, then display content will not be updated.

Error detailed information

When "Error Details" is selected for "Switch Display," the detailed information, the cause, and the corrective action on the error are displayed in the detailed information field.

By clicking the [Error Jump] button after selecting any of the items, the cursor jumps to the location in which the error has occurred.

Ex.

An display example of the detailed information field for the following error is as shown below:

- Error Code: H3401
- Overview: Operation Error

| | | | |
|----------------------|--|---|---|
| Detailed Information | Program location | - | - |
| | Sequence step No. :160 FB No. :1 (TON) File name :SlibFbFile.PFB | - | - |
| Cause | - Data that cannot be converted by using the data conversion instruction was input. | | |
| Corrective Action | - Check and correct the error program (step) displayed by using the error jump function. | | |

Displayed items

| Item | | Description |
|----------------------|------------------------------|---|
| Detailed Information | Error location information*1 | Information on the location in a program, such as a step No., is displayed. |
| Cause | | The error cause is displayed. |
| Corrective Action | | The corrective action for the error code is displayed. |

- *1 Displayed items differ depending on the error code.
If there is no detailed information, "-" is displayed in each item.
For details on error codes, refer to the user's manual of each module.

FB hierarchy information

FB hierarchy information expresses the order of the data calling function blocks by hierarchies in a program in which a function block is called from another function block.

FB hierarchy information of the function block with an error is displayed in the detailed information field by selecting "FB Hierarchy Information" for "Switch Display."

By selecting a row and clicking the [Error Jump] button or double-clicking the row, the cursor can jump to the jump destination of the selected row.

By selecting this item, the calling sources of a function block with an error can be displayed in a list. Therefore, the cursor can jump to the sources, which makes it easier to specify the error cause.

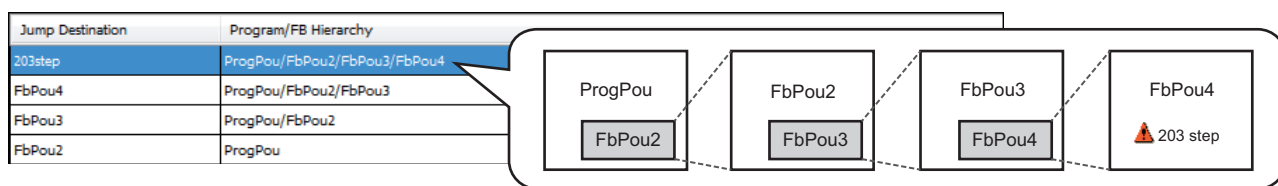
FX5CPUs do not support this information.

The following figures show an display example of FB hierarchy information.

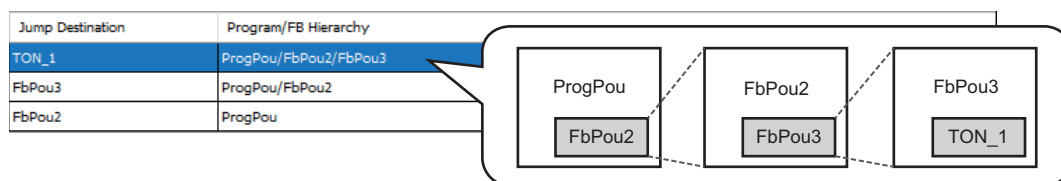
Ex.

When 'FbPou2' is called from 'ProgPou,' 'FbPou3' from 'FbPou2,' and any of the following function blocks from 'FbPou3':

- Function block: FbPou4



- Standard function block: TON_1



Displayed items

| Item | | Description |
|----------------------|-----------------------|--|
| Jump Destination | First row | The step No. of the location in which an error has occurred is displayed. If the error has occurred in a standard function block, its FB instance name is displayed. |
| | Second and later rows | The FB instance name of either of the following function blocks is displayed. <ul style="list-style-type: none"> • Function block in which a ladder of the step No. in the first row exists • Function block calling the function block displayed in the one row above |
| Program/FB Hierarchy | | The FB hierarchy information of the function block with an error is displayed. FB hierarchy information is displayed separately for each jump destination. |

Precautions

- Whether or not FB hierarchy information can be displayed depends on the firmware of a CPU module. For information on the firmware versions with which the FB hierarchy information can be displayed, refer to the following:
📖 MELSEC iQ-R CPU Module User's Manual (Application)
- When diagnosing a module other than the host CPU module in a multiple CPU system, FB hierarchy information cannot be displayed. ("FB Hierarchy Information" cannot be select for "Switch Display.")
- When clearing an error by either of the following operations, its FB hierarchy information display is also cleared:
 - Clicking the [Clear Error]] button in the module diagnostics screen
 - Turning SM50 (error reset) ON
- FB hierarchy information can be displayed only when an error has occurred in the following data:
 - Function
 - Standard function block
 - Subroutine type function block
 - Macro type function block called from a subroutine type function block
- When an error has occurred in the function block called from an interrupt program or a subroutine program, the FB hierarchy information from the program to the function block with the error is displayed.
- In the following cases, FB hierarchy information may not be displayed or the cursor may not jump to the location from which a function block is called:
 - Contents of a project opened in GX Works3 are different from the ones written in a CPU module.
 - The block password or security key for a program written in a CPU module is not authenticated.
 - An error has occurred in the instruction using a bit device which automatically turns ON at the processing completion as an argument, or in the one used by a system interrupt (PLSY instruction or PWM instruction, for example).
 - An error has occurred in the function called from an interrupt program or a subroutine program.
- FB hierarchy information can be displayed only in the module diagnostics screen of GX Works3.
Even when diagnosing a CPU module with the web server function (CPU diagnostic), the FB hierarchy information is not displayed in the system web page.

Error jump

The cursor jumps to the following locations by clicking the [Error Jump] button.

- Location in which the error selected in the error list or the detailed information field (Error Details) has occurred
- Jump destination of the row selected in the detailed information field (FB Hierarchy Information)

The cursor can jump to programs, function blocks, and parameters only.

However, it cannot jump to some parameters. The parameters to which it can jump differ depending on the module.

For an inline structured text program in a ladder editor, the cursor will jump to the head line of the inline structured text program regardless of the line that error occurs.

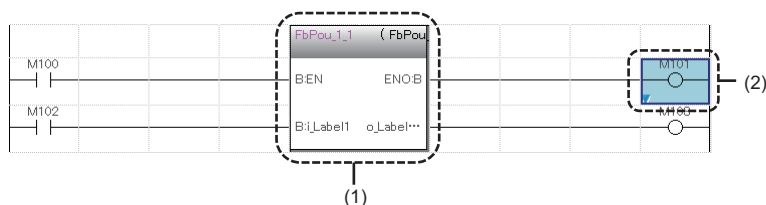
Precautions

■ Jump destination

In the following conditions, an error may not be found at the jump destination.

- When the open project does not match with the data on the CPU module.
- When diagnosing programmable controller other than the one set as a connection destination in the project.

When the cursor jumps to the output argument (2) connected to the macro type function block (1), an error may actually exist not in the output argument (2) but in the macro type function block (1).



■ Program file with the process control extension enabled

When an error occurs in the system data such as the system header or system footer created in a program file with the process control extension enabled, the cursor will not jump to that data.

If an error occurs, it may be due to any of the following option settings. Check the setting contents.

- The module which has been set in "Convert" ⇒ "Process Control Extension Setting" ⇒ "Event Notification" does not exist or the setting contents is not correct.
- The capacity in the range of the file register which has been set in "Convert" ⇒ "Process Control Extension Setting" ⇒ "System Resource" ⇒ "File Register: ZR" exceeds that of the file register which has been set in "File Register Setting" of "CPU Parameter."

Module information list

The current LED information and switch information of a target module are displayed in the [Module Information List] tab.

16.5 Network Diagnostics

This section explains the method to diagnose various networks.

Ethernet diagnostics

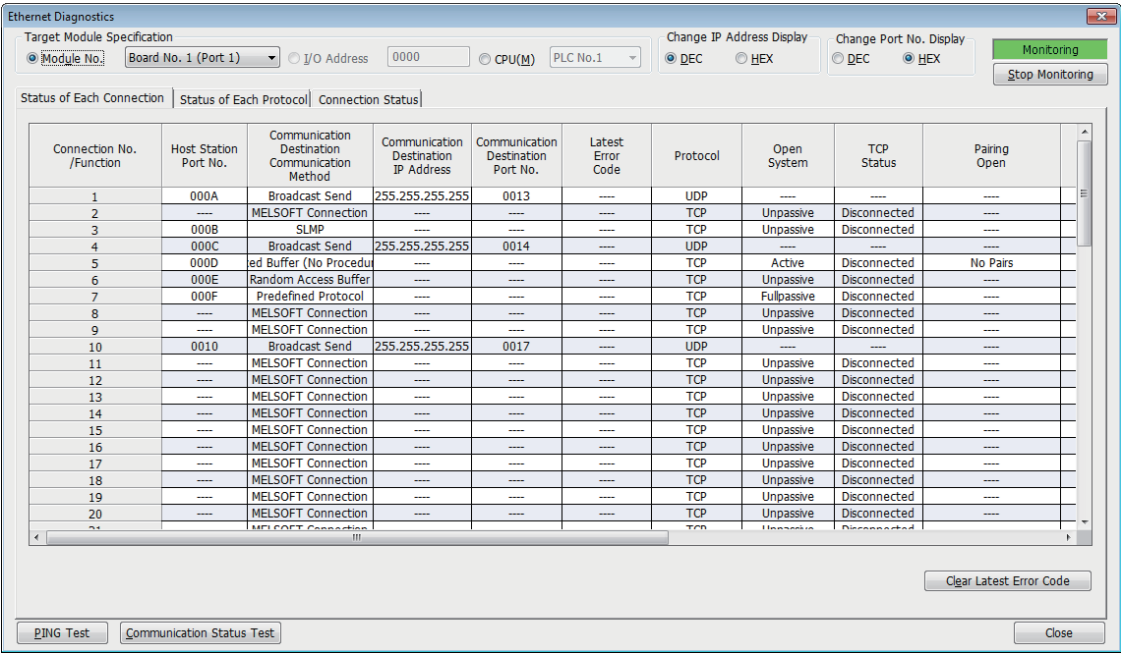
Check the status of each connection, status of each protocol, and connection status.

For details, refer to the following:

- 📖 MELSEC iQ-R Ethernet User's Manual (Application)
- 📖 MELSEC iQ-F FX5 User's Manual (Ethernet Communication)
- 📖 MELSEC iQ-F FX5-ENET User's Manual

Window

Select [Diagnostics] ⇒ [Ethernet Diagnostics].



Precautions

When an Ethernet interface module (LJ71E71-100) is used in a system of an LHCPU, do not perform a diagnosis in GX Works3 Version 1.090U or earlier. Otherwise, GX Works3 may not operate properly.

CC-Link IE Controller Network diagnostics

A network status can be monitored, diagnosed, and tested.

For details, refer to the following:

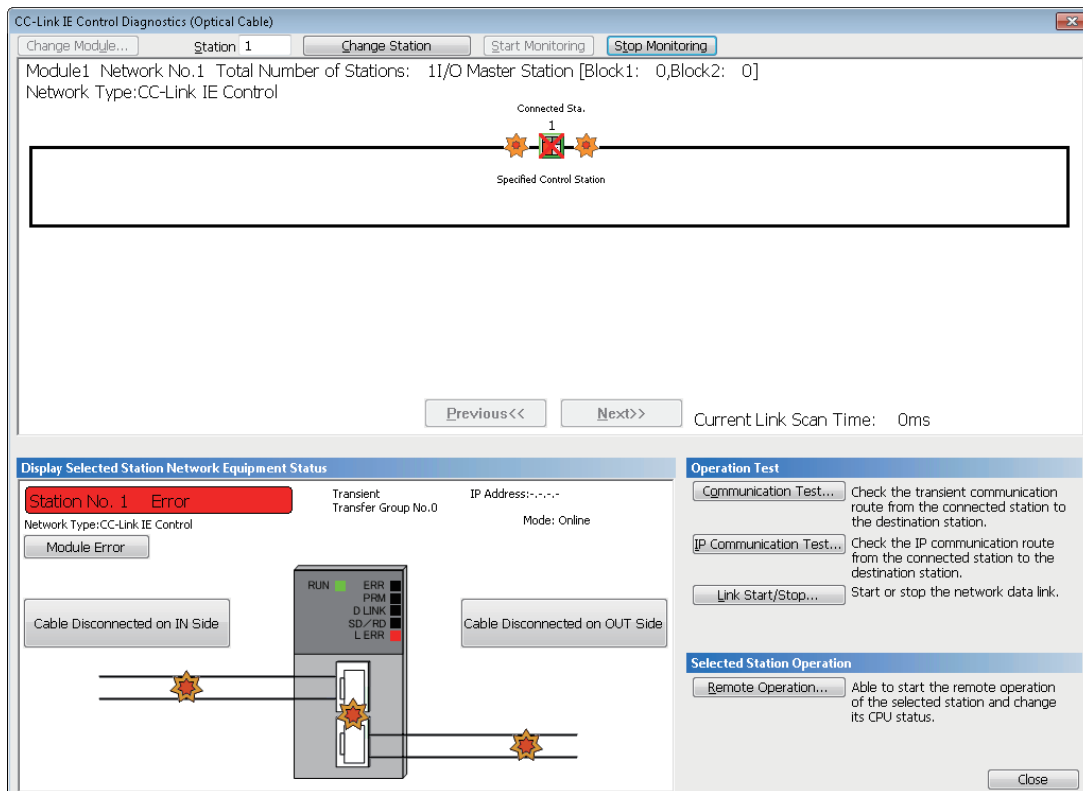
📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application)

LHCPUs, FX5CPUs, and remote head modules do not support this function.

Window

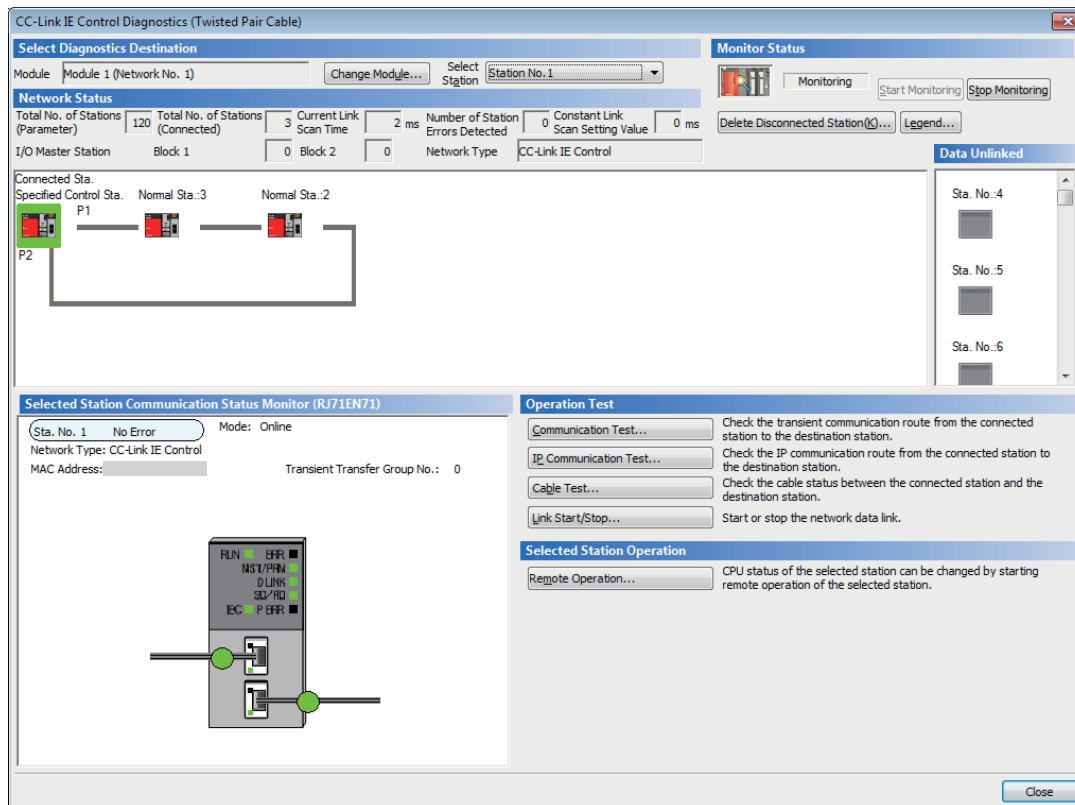
■Optical cable

Select [Diagnostics] ⇒ [CC-Link IE Control Diagnostics (Optical Cable)].



■ Twisted pair cable

Select [Diagnostics] ⇒ [CC-Link IE Control Diagnostics (Twisted Pair Cable)].



CC-Link IE TSN/CC-Link IE Field Network diagnostics

A network status can be monitored, diagnosed, and tested.

For details, refer to the following:

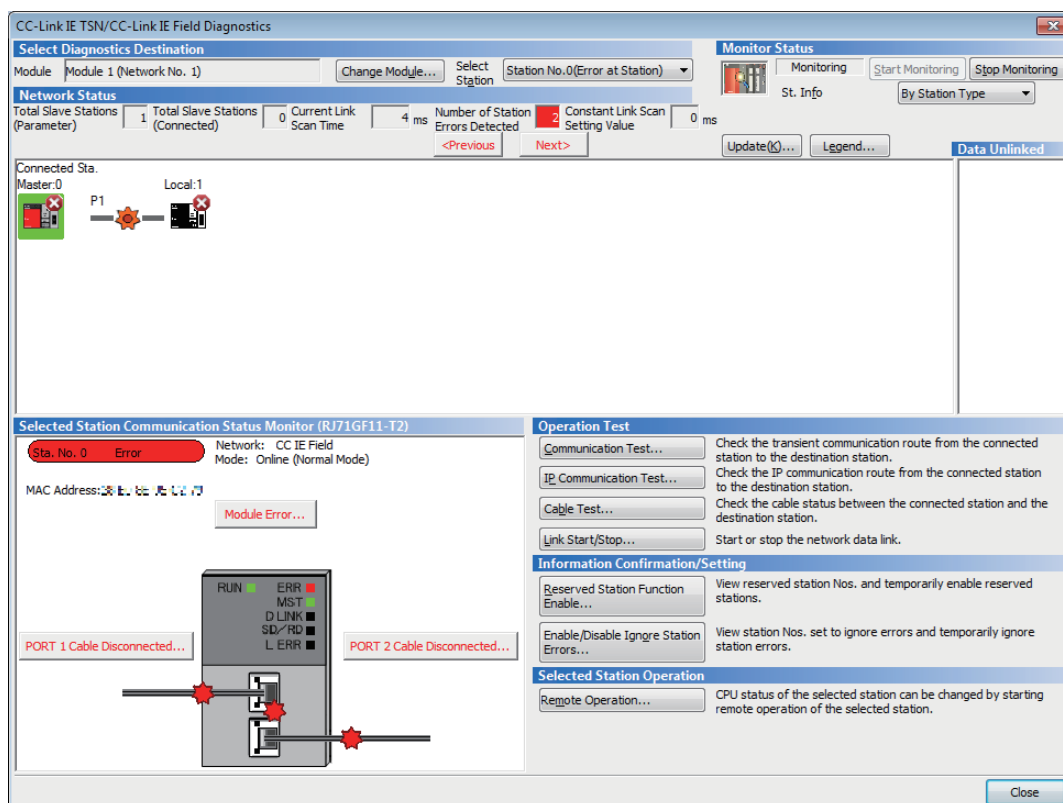
- 📖 MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)
- 📖 MELSEC iQ-F FX5 User's Manual (CC-Link IE)
- 📖 MELSEC iQ-R CC-Link IE TSN User's Manual (Application)
- 📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual
- 📖 MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN)
- 📖 MELSEC iQ-R Motion Module User's Manual (Network)
- 📖 MELSEC iQ-F FX5 Motion Module User's Manual (CC-Link IE TSN)
- 📖 CC-Link IE TSN—CC-Link IE Field Network Bridge Module User's Manual

Window

Select [Diagnostics] ⇒ [CC-Link IE TSN/CC-Link IE Field Diagnostics].

Ex.

CC-Link IE Field Network



■Displaying product information

The product information of a module can be checked by the following operation.

- Select and right-click a module, and select [Production Information] from the shortcut menu.

Note that this function cannot be used when a selected module does not support displaying the product information or an error occurs on a connected station.

For details, refer to the manual of each module.

■Displaying an error history

An error history in a device station can be checked by the following operation.

- CC-Link IE TSN diagnostics: Select and right-click a module, then select [Error/Event History] from the shortcut menu.
- CC-Link IE Field diagnostics: Select and right-click a module, then select [Error History] from the shortcut menu.

This function is available only when a remote device station or intelligent device station which can read an error history is selected.


■Displaying the sensor/device monitor screen

The sensor/device monitor screen can be displayed by the following operation. (For a CC-Link IE TSN-AnyWireASLINK bridge module only)

FX5CPUs do not support this screen.

- Select and right-click a CC-Link IE TSN-AnyWireASLINK bridge module in the CC-Link IE TSN Diagnostics screen, then select [AnyWireASLINK Sensor/Device Monitor] from the shortcut menu.

For details, refer to the following:

 iQ Sensor Solution Reference Manual


■Displaying the CC-Link IE Field Diagnostics screen

The CC-Link IE Field Diagnostics screen can be displayed by the following operation. (For CC-Link IE TSN-CC-Link IE Field Network bridge modules only)

RnPCPUs, RnPSFCPUs, LHCPUs, and FX5CPUs do not support this screen.

- Select and right-click a CC-Link IE TSN-CC-Link IE Field Network bridge module in the CC-Link IE TSN Diagnostics screen, then select [CC-Link IE Field Diagnostics] from the shortcut menu.

For details, refer to the following:

 CC-Link IE TSN—CC-Link IE Field Network Bridge Module User's Manual

■Considerations

When a CC-Link IE Field Network master/local module (LJ71GF11-T2) is used in a system of an LHCPU, do not perform a diagnosis in GX Works3 Version 1.090U or earlier. Otherwise, GX Works3 may not operate properly.

For details, refer to the following:

RnCPUs, RnENCPUs, LHCPUs, FX5CPUs, and FX5-ENET support this function.

Window

[illegible]

MELSECNET diagnostics

A network status of each station can be monitored, diagnosed, and tested.
Considerations for using MELSECNET/H network module when performing the MELSECNET diagnostics, refer to the following manual.

📖MELSEC iQ-R Module Configuration Manual

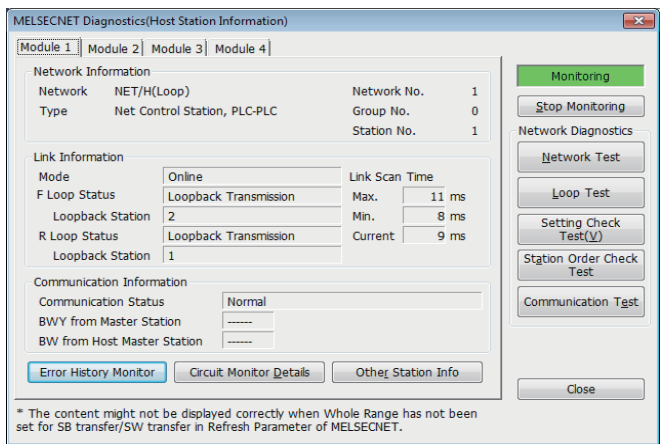
For the operation methods, refer to the following:

📖MELSEC iQ-R MELSECNET/H Network Module User's Manual (Application)

RnPSFCPU's, LHCPU's, FX5CPU's, and remote head modules do not support this function.

Window

Select [Diagnostics] ⇨ [MELSECNET Diagnostics].



CC-Link diagnostics

A network status of each station can be monitored, diagnosed, and tested.

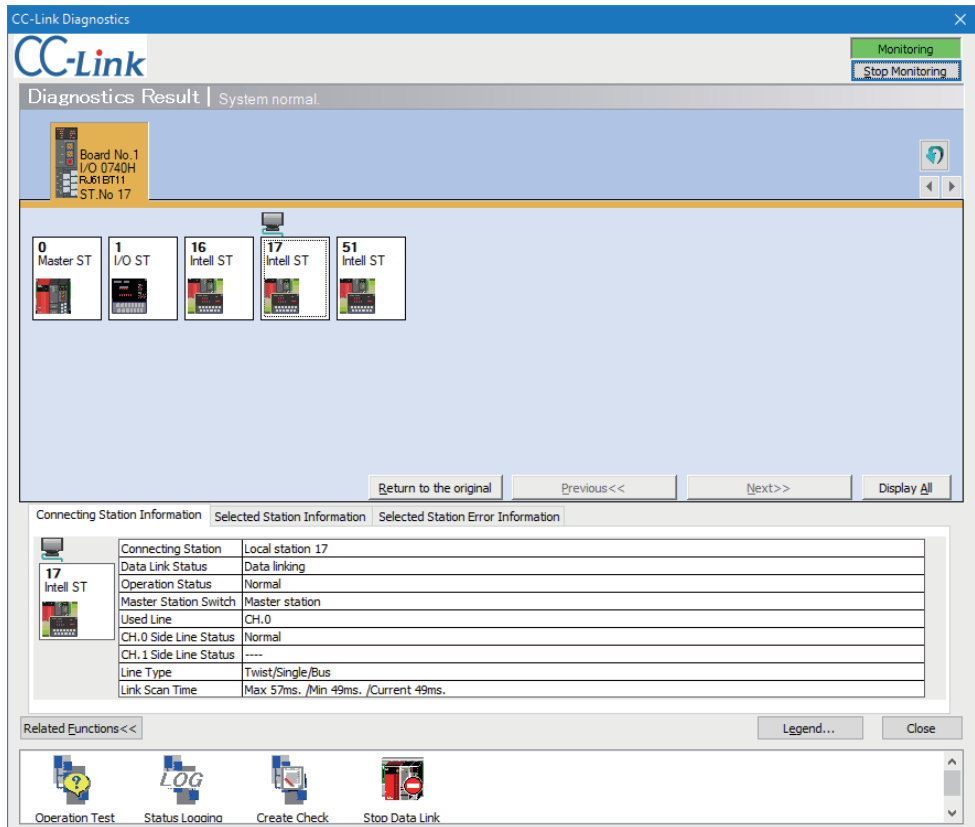
For details, refer to the following:

📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (CC-Link)

Window

Select [Diagnostics] ⇨ [CC-Link Diagnostics].



Company name in the selected station information

The company name/manufacture code of a device connected with CC-Link is displayed in the "Company Name" column in the [Selected Station Information] tab.

When the company name is described in the manufacturer code list (Example: partner_ ja.dat), the name is displayed.

Otherwise, the manufacturer code is displayed.

Note that manufacturer codes may not be listed due to the partner manufacturer's circumstances.

Changing method for a company name/manufacture code

A company name/manufacture code can be changed by either of the following methods:

- Edit a character string in the "Company Name" column in the [Selected Station Information] tab. *1
- Edit the manufacturer code list in a text editor.

*1 Can be edited only when monitoring is stopped. (Up to 32 characters)
Edited character strings are not applied to the manufacturer code list.

Storage destination of the manufacturer code list

The manufacturer code list is stored in the installation folder of GX Works3.

The storage destination when the installation folder is not changed at the installation of GX Works3 is as follows:

- 64-bit version operating system: C:\Program Files (x86)\MELSOFT\GPPW3\Recipe\Online\DNaviZero\DNaviSatellite\CCLink
- 32-bit version operating system: C:\Program Files\MELSOFT\GPPW3\Recipe\Online\DNaviZero\DNaviSatellite\CCLink

File name of the manufacturer code list

The manufacturer code list is prepared with a different name for each display language of GX Works3.

The combinations of display languages and file names are as follows:

- Japanese: partner_ ja.dat
- English: partner_ en.dat
- Simplified Chinese: partner_ chs.dat

Manufacturer code list file format

Edit the manufacturer code list according to the following file format.

| Item | Manufacturer code | Company name |
|------------------------------|--|---|
| Maximum number of characters | 5 characters | 255 characters |
| Available character | 0 to 9 | Characters in the Unicode Basic Multilingual Plane |
| Remarks | Manufacturer codes that have six digits or more are ignored. | Character strings that exceed the width in the display area are not displayed. The start and end " (double quotes) are deleted. (Example : "Mitsubishi Electric Corporation" → Mitsubishi Electric Corporation) |

Ex.

The following shows the example image when displaying the manufacturer code list in a text editor.

```
00000,MITSUBISHI ELECTRIC CORPORATION
00001,MITSUBISHI ELECTRIC CORPORATION
00002,MITSUBISHI ELECTRIC CORPORATION
00003,MITSUBISHI ELECTRIC CORPORATION
```

Simple CPU communication diagnostics

A network status can be diagnosed.

For details, refer to the following:

MELSEC iQ-R Ethernet User's Manual (Application)

MELSEC iQ-F FX5 User's Manual (Ethernet Communication)

Window

Select [Diagnostics] ⇒ [Simple CPU Communication Diagnostics].

[illegible]

16.6 Error History/Operation History Check

The module's error information, history of operation, and system information can be displayed using the event history function. The detailed information of the error history can be displayed when a CPU module and an intelligent function module supports the module error history collection function.

For the versions of modules that support this function, refer to the user's manual of each module.

Window

Select [Diagnostics] ⇒ [Module Diagnostics (CPU Diagnostics)] or [System Monitor], and click the [Event History] button.

| No. | Occurrence Date | Event Type | Status | Event Code | Overview | Source | Start I/O No. |
|-------|-------------------------|------------|-------------|------------|--|--------|---------------|
| 00001 | 2020/03/27 13:52:10.797 | Operation | Information | H24100 | Operating status change (RUN) | R04CPU | 3E00 |
| 00002 | 2020/03/27 13:52:10.044 | System | Information | H00100 | Link-up | R04CPU | 3E00 |
| 00003 | 2020/03/27 13:52:09.397 | Operation | Information | H24101 | Operating status change (STOP) | R04CPU | 3E00 |
| 00004 | 2020/03/27 13:52:07.018 | Operation | Information | H24100 | Operating status change (RUN) | R04CPU | 3E00 |
| 00005 | 2020/03/27 13:52:07.013 | System | Information | H00400 | Power-on and reset | R04CPU | 3E00 |
| 00006 | 2020/03/27 13:52:01.607 | System | Information | H00420 | Event history file generation | R04CPU | 3E00 |
| 00007 | 2020/03/27 13:52:01.412 | Operation | Information | H24200 | Creation of new folders, writes to files/folders | R04CPU | 3E00 |
| 00008 | 2020/03/27 13:52:01.386 | Operation | Information | H24200 | Creation of new folders, writes to files/folders | R04CPU | 3E00 |

For MELSEC-Q/L series modules, '-' is displayed in the "Status" column.

Operating procedure

■Event history refinement

1. Select either "Match All the Conditions" or "Match Any One of the Conditions."
2. Set the conditions.
3. Click the [Start Refine] button.

Ex.

Display an event of the major error that occurred between 9:00 am and 12:00 pm in April 4th

Refine

☒ Match All the Conditions ☐ Match Any One of the Conditions

1. Occurrence Date: After Next Date, 2020/04/04 09:00:00

2. Occurrence Date: Before Next Date, 2020/04/04 12:00:00

3. Status: Major

Start Refine Clear Refine Conditions

■ Jump to a location in which an error occurred

Click the [Jump] button.

Target items are a program, function block, and each parameter.

■ Event history clearing

Click the [Clear All] button.

All event histories are deleted.

Precautions

- The occurrence date on the event history depends the time zone selected in "Clock Related Setting" of "Operation Related Setting" of "CPU parameter." Therefore, the time shown in the screen may be different from the one on the personal computer in use.
- The event, success to lock/unlock the remote password, is registered more than once when performing any of the following operations for a CPU module for which a remote password has been set; writing/reading data to/from a programmable controller or diagnosing the CPU module.
- If the entire information is not displayed in "Detailed Information," check it in the tooltip.
The tooltip can be displayed by mouse-overing each item in "Detailed Information."
- When changing a current value of a label, an event recorded in a module differs depending on the product (GX Works3 or external device) used for changing the value.


The following table shows an event recorded in a module and contents displayed in the "Event History" screen for each product used:

| Product used for changing a current value | Recorded event | Content displayed in the "Event History" screen |
|--|---------------------------------|---|
| GX Works3 Version 1.065T or later | Modify value event for a label | Program name Label name Device/label memory assigned to a label |
| GX Works3 Version 1.063R or earlier External device | Modify value event for a device | Program name Device/label memory assigned to a label |

For the label memory types, refer to the following:

 Page 938 Label Memory Types

For details on events, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

 MELSEC iQ-F FX5 User's Manual (Application)

17 COLLECTING/REPRODUCING DATA

This chapter shows the methods for collecting and reproducing data by using the memory dump function, data logging function, and recording function.

The functions to collect and reproduce data are shown in the following table.

| Function name | Overview | Reference |
|-----------------|---|--|
| Memory dump | To save device values in a CPU module to a personal computer at any timing. | Page 752 Memory Dump Function MELSEC iQ-R CPU Module User's Manual (Application) MELSEC iQ-F FX5 User's Manual (Application) |
| Data logging | To collect data in a CPU module at a specified interval or any timing. | Page 756 Data Logging Function MELSEC iQ-R CPU Module User's Manual (Application) MELSEC iQ-F FX5 User's Manual (Application) |
| Recording | To collect data specified as a recording target from a control CPU module and save the data by using a recorder module or camera recorder module. | Page 759 Recording Function MELSEC iQ-R System Recorder User's Manual (Application) MELSEC iQ-R System Recorder Co-recording Function Reference Manual |
| Offline monitor | To check data collected from a programmable controller in the monitor screen of GX Works3. Moreover, to check the data by displaying it in a waveform in GX LogViewer. | Page 765 Checking Collected Data on Program Editor GX LogViewer Version 1 Operating Manual |

17.1 Memory Dump Function

Device values of a CPU module can be checked at any timing with the memory dump function of a CPU module.

By setting the trigger conditions, the data at a time when the conditions have been satisfied are collected and saved to the SD memory card. The saved device values can be checked with GX Works3.

For details on the memory dump function of CPU modules, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

R00CPU and remote head modules do not support this function.

Procedure for using the memory dump function

1. Set the internal buffer capacity of the CPU module to use the memory dump function. (📖 Page 752 Setting the internal buffer capacity for the memory dump function)
2. Write the memory dump setting file. (📖 Page 753 Writing memory dump settings)
Once it is written, the memory dump result file is saved to an SD memory card when the set trigger conditions are satisfied.
3. Read the memory dump result file to the personal computer. (📖 Page 754 Reading memory dump results)
4. Check the read memory dump result file. (📖 Page 755 Displaying memory dump results)

Setting the internal buffer capacity for the memory dump function

RCPU and LHCPU

The internal buffer capacity for the memory dump function can be set in "Internal Buffer Capacity Setting" of "Memory/Device Setting" of "CPU Parameter." After the setting, write the CPU parameters to a CPU module.

However, when using the data logging function, the memory dump function, and the realtime monitor function of a CPU module at the same time, set the capacity within the range that meets the following conditions.

The total of data logging buffer capacities + memory dump buffer capacity + realtime monitor buffer capacity \leq 3072 KB

Each buffer capacity can be checked with the following:

- Data logging buffer capacity, Memory dump buffer capacity: CPU parameter
- Realtime monitor buffer capacity: The realtime monitor setting of GX LogViewer

FX5CPU

Whether to use the memory dump function can be set in "Function to Use Internal Buffer" of "Memory/Device Setting" of "CPU Parameter."

When using the memory dump function, the internal buffer capacity cannot be changed.

After the setting, write the CPU parameters to a CPU module.

Precautions

The data logging function and the memory dump function cannot be used at the same time.

Writing memory dump settings

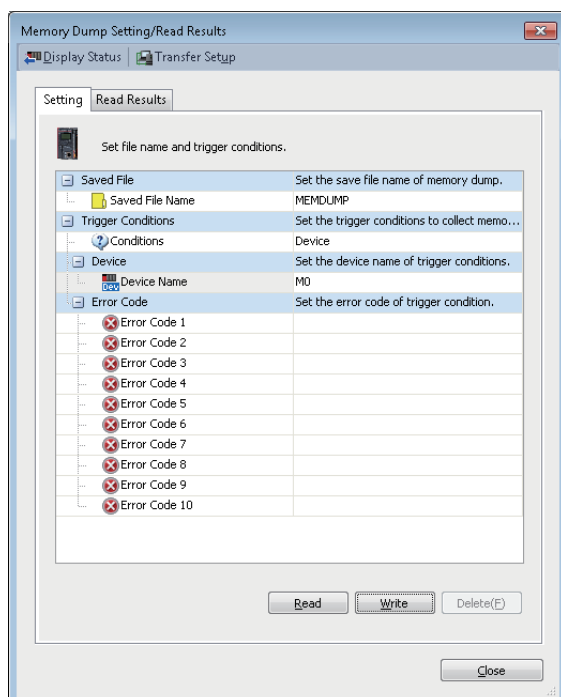
Once the memory dump setting file is written, the memory dump function is started and waits for a trigger.

If the memory dump setting file has already been stored, the memory dump function is started by powering ON the CPU module.

Window

Select [Debug] ⇒ [Memory Dump] ⇒ [Setting].

The following screen is an example when opening a project for an RCPU.



Operating procedure

Set each item and click the [Write] button.

| Item | Description |
|--------------------|--|
| Saved File | Set a name of a file to be output when the memory dump function is performed. A number, '00' to '99' is added to the end of the set name for the file name to be output actually. |
| Trigger Conditions | Specify the trigger conditions to collect memory dump. ■ Trigger condition that can be set (RCPU and LHCPU) <ul style="list-style-type: none"> • Device: Specify this to set the timing when the bit data of a specified device turns from OFF to ON as the trigger condition. • Error Code: Specify this to set an error code of CPU module as the trigger condition. • Device/Error Code: Specify this to set a device/error code as the trigger condition. The memory dump function is performed when any of the conditions is satisfied. ■ Trigger condition that can be set (FX5CPU) <ul style="list-style-type: none"> • Device: Specify this to set the timing when the bit data of a specified device turns from OFF to ON as the trigger condition. • On Error: Specify this to set the timing when an error occurs on a CPU module as the trigger condition. • Device/On Error: Specify this to set the timing either when the bit data of a specified device turns from OFF to ON or when an error occurs on a CPU module as the trigger condition. The memory dump function is performed when any of the conditions is satisfied. |
| Device | Specify a device to be set as the trigger condition. Only global devices can be specified. ■ Device representation that can be specified (RCPU and LHCPU) <ul style="list-style-type: none"> • Bit device: X, Y, M, L, F, SM, V, B, SB, T (enter 'TS'), ST (enter 'SS/STS'), C (enter 'CS'), LT (enter 'LTS'), LST (enter 'LSS/LSTS'), LC (enter 'LCS'), FX, and FY • Word device (bit specification): D, SD, W, SW, R, ZR, FD, RD ■ Device representation that can be specified (FX5CPU) <ul style="list-style-type: none"> • Bit device: X, Y, M, L, F, SM, B, SB, T (enter 'TS'), ST (enter 'STS'), C (enter 'CS'), LC (enter 'LCS') • Word device (bit specification): Not applicable |
| Error Code*1 | Specify a 4-digit error code to be set as the trigger condition in hexadecimal. The wild card, "***" can be specified for the 1st digit of an error code only. |

*1 FX5CPUs do not support it.

The number for annunciator cannot be specified as the error code to be set as the trigger condition. Use the device name in order to specify the number of annunciator.

Considerations for memory dump setting

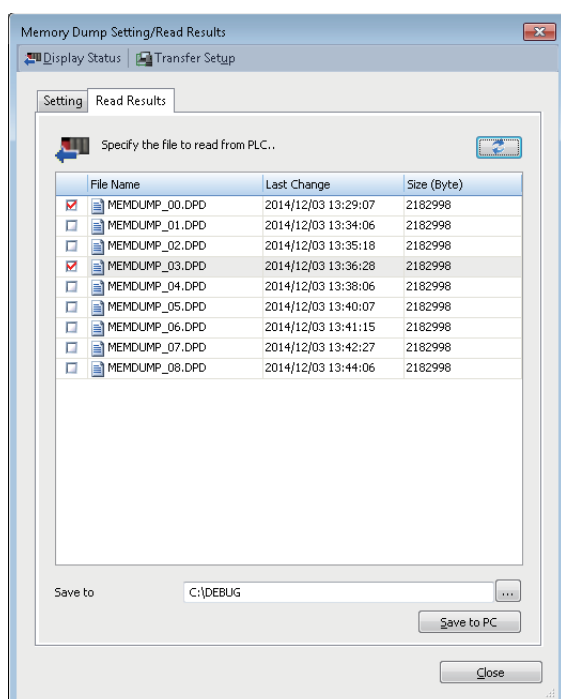
- Before writing the memory dump setting, check that the trigger condition has not already satisfied.
- When a file register is specified as the trigger condition, do not change the file register file name and the file register block No. once the memory dump setting has been written.

Reading memory dump results

To check a memory dump result file in GX Works3, the file is required to be read from an SD memory card inserted in a CPU module and saved to a personal computer in advance.


Window

Select [Debug] ⇒ [Memory Dump] ⇒ [Read Results].



The current execution status of the memory dump function can be checked by selecting [Display Status].

Operating procedure

1. After clicking , specify the memory dump result file to be read.
2. Specify "Save to," and click the [Save to PC] button.

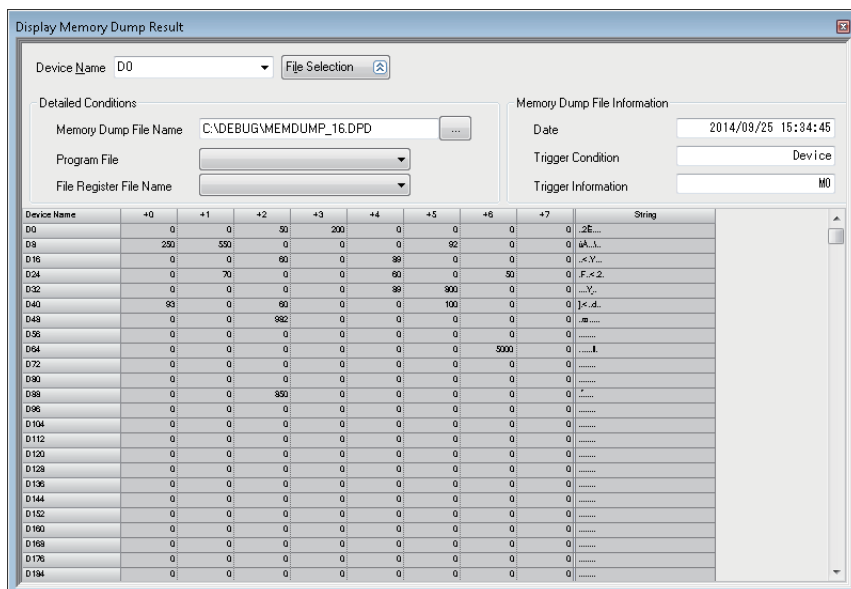
Displaying memory dump results

A memory dump result file saved in a personal computer can be displayed.

Window

Select [Debug] ⇒ [Memory Dump] ⇒ [Display Result].

The following screen is an example when opening a project for an RCPU.



Operating procedure

Enter the path for the memory dump result file to be displayed in "Memory Dump File Name."

- To specify a local device for "Device Name," select the program file to be referred in "Program File."
- To specify 'R' or 'ZR' for "Device Name," select the file register to be referred in "File Register File Name." When 'R' is specified, the device for the first block is displayed.
- To specify 'Z' or 'LZ' for "Device Name," select the program file to be referred in "Program File."

Precautions

For FX5CPUs, both "Program File" and "File Register File Name" are not available.

Deleting memory dump results

A memory dump result file in an SD memory card inserted in a CPU module can be deleted.

By following the procedure below, delete the folder in which a memory dump result file is saved.

Operating procedure

1. Select [Online] ⇒ [User Data] ⇒ [Delete].
2. Click the [Browse] button for "SD Delete Target Folder."
3. Select and right-click the folder in which a memory dump result file is saved (example: MEMDUMP), then select [Delete Folder] from the shortcut menu.

17.2 Data Logging Function

Data can be collected at a specified timing with the data logging function of a MELSEC-iQ-R series, MELSEC iQ-L series, or MELSEC iQ-F series CPU module.

For details on the data logging function, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

For R00CPU, the data logging function is not available.

Procedure for using the data logging function

1. Set the internal buffer capacity of the CPU module, which is used for the data logging function. (📖 Page 758 Setting internal buffer capacity for the data logging function)
2. Configure the data logging settings with CPU Module Logging Configuration Tool, and write the setting to the CPU module.
3. Start data logging with CPU Module Logging Configuration Tool.
4. Check the data logging results (logging data) in GX LogViewer.

For the operation methods of CPU Module Logging Configuration Tool, refer to the following:

📖 CPU Module Logging Configuration Tool Version 1 Operating Manual

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

For the operation methods of GX LogViewer, refer to the following:

📖 GX LogViewer Version 1 Operating Manual

Starting method of CPU Module Logging Configuration Tool

The following shows the method for starting CPU Module Logging Configuration Tool from GX Works3.

When setting the data name and data type of a selected device/label automatically to the "Data" setting screen of CPU Module Logging Configuration Tool, start the operation from step 1. When not setting the data name and data type automatically, start from step 2.

Operating procedure

- 1.** Select a device/label in any of the following windows of GX Works3:
 - Ladder editor
 - ST editor
 - FBD/LD editor
 - Watch window
- 2.** Perform either of the following operations in GX Works3:
 - Select [Tool] ⇒ [Logging Configuration Tool].
 - Right-click the device/label and select [Set to Logging Target (Logging Configuration Tool)] from the shortcut menu.

Point

The following information is applied to CPU Module Logging Configuration Tool when starting the configuration tool:


- Module type information of a project
- Current connection destination of a project
- Display language
- Data name and data type of a device/label (Applied to the "Data" setting screen automatically.)

Precautions

- The data name and data type of a label used in a project for any of the following CPU modules are not set automatically: R00CPU, RnPCPU, RnPSFCPU, LHCPU, or FX5CPU.
- Devices/labels exceeding the maximum number of settable points are not set.

Starting method of GX LogViewer

For the method for starting GX LogViewer from GX Works3, refer to the following:

 Page 683 Procedure for using the realtime monitor

Setting internal buffer capacity for the data logging function

RCPU and LHCPU

The internal buffer capacity for the data logging function can be set in "Internal Buffer Capacity Setting" of "Memory/Device Setting" of "CPU parameter." After the setting, write the CPU parameters to a CPU module.

However, when using the data logging function, the memory dump function, and the realtime monitor function of a CPU module at the same time, set the capacity within the range that meets the following conditions.

The total of data logging buffer capacities + memory dump buffer capacity + realtime monitor buffer capacity \leq 3072 KB

Each buffer capacity can be checked with the following:

- Data logging buffer capacity, memory dump buffer capacity: CPU parameter
- Realtime monitor buffer capacity: the realtime monitor setting of GX LogViewer

FX5CPU

Whether to use the data logging function can be set in "Function to Use Internal Buffer" of "Memory/Device Setting" of "CPU Parameter."

The internal buffer capacity for the data logging function can be set in "Internal Buffer Capacity Setting" of "Memory/Device Setting" in "CPU parameter."

After the setting, write the CPU parameters to a CPU module.

However, set the capacity in the range that satisfies the following condition.

The total of data logging buffer capacities \leq 320 KB

For FX5SCPU and FX5UJCPU, the internal buffer capacity cannot be changed from the default.

Precautions

The data logging function and the memory dump function cannot be used at the same time.

17.3 Recording Function

Data specified as a recording target can be collected from a control CPU module and saved as a recording file in the destination specified in a recording setting by using the recording function of a recorder module and camera recorder module. For details on the recording function, refer to the following:

📖 MELSEC iQ-R System Recorder User's Manual (Application)

📖 MELSEC iQ-R System Recorder Co-recording Function Reference Manual

The recording function is available in projects for RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU), RnENCPUs, and RnSFCPUs.

Procedure for using the recording function

1. Add a recorder module or camera recorder module to a project.
2. Open "Recording Setting" screen, and configure settings of the recording function. (👉 Page 759 Settings of the recording function)
3. Write the project to a CPU module. (👉 Page 597 WRITING/READING DATA TO CPU MODULE)
4. Read a recording file and check the recording results with the offline monitor function. (👉 Page 761 Reading/deleting a recording file, Page 769 Checking a recording file)

Settings of the recording function

Settings of the recording function except for parameter settings can be configured in the "Recording Setting" screen. For details on the operations and setting items in the "Recording Setting" screen, refer to the following:

📖 MELSEC iQ-R System Recorder User's Manual (Application)

Creating/editing a recording setting

The following shows the procedure to create or edit a recording setting.

Operating procedure

■ Creating a new setting

1. Select "Parameter" ⇒ "Module Information" in the navigation window.
2. Select [Project] ⇒ [Data Operation] ⇒ [Add New Module].
3. Select "Information Module" from the pull-down list of "Module Type" in the "Add New Module" screen, then select a recorder module or camera recorder module from the pull-down list of "Module Name."
4. Set each item and click the [OK] button.
5. Select [Recording] ⇒ [Recording Setting] ⇒ [New].
6. Set each item and click the [OK] button.

Point

A new recording setting can also be created by the following operation after adding a recorder module or camera recorder module to a project:

- Select "Parameter" ⇒ "Recording Setting" in the navigation window, then right-click it and select [New] from the shortcut menu.

■Editing a setting

1. Select [Recording] ⇒ [Recording Setting] ⇒ [Edit].
2. Select a recording setting from the pull-down list of "Select Recording Setting" in the "Edit" screen.
3. Set each item and click the [OK] button.

Point

A recording setting can also be edited by the following operation:

- Double-click "Parameter" ⇒ "Recording Setting" ⇒ "(recording setting)" in the navigation window.

Deleting a recording setting

The following shows the procedure to delete a recording setting.

Operating procedure

1. Select "Parameter" ⇒ "Recording Setting" ⇒ "(recording setting)" in the navigation window.
2. Right-click it and select [Delete Data] from the shortcut menu.
3. Read a displayed message, and click the [Yes] button.

Point

All recording settings are deleted in the following cases:

- All recorder modules and camera recorder modules are deleted from a project.
- A recorder module or camera recorder module is no longer controlled by a host CPU.
- The CPU module type is changed to one which is not supported by a recorder module or camera recorder module.

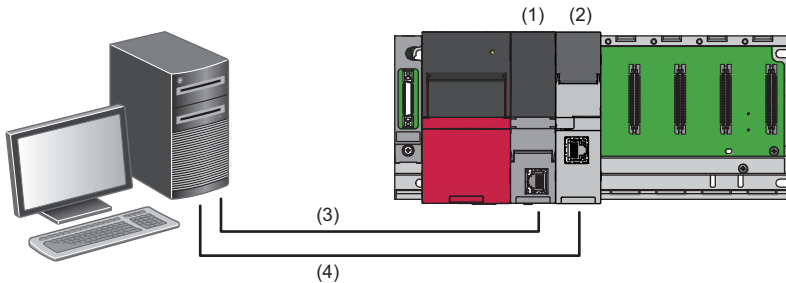
Reading/deleting a recording file

To check recording results in GX Works3, a recording file is required to be read from an SD memory card inserted in a recorder module or camera recorder module.

A recording file can be read or deleted in the "Recording File Reading" screen.

Before opening the "Recording File Reading" screen, connect a personal computer to a CPU module and a recorder module or camera recorder module.

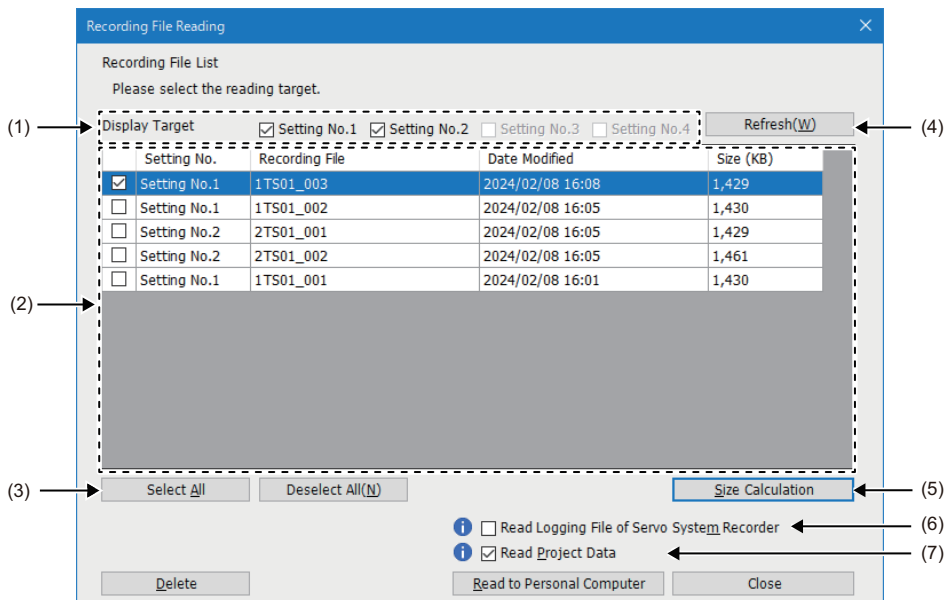
This operation is not required when a recording file is saved in a file server.



- (1) CPU module
- (2) Recorder module or camera recorder module
- (3) USB cable or Ethernet
- (4) Ethernet

Operating procedure

1. Select [Recording] ⇒ [Read Recording File].
2. Read a displayed message, and click the [OK] button.
3. Read a recording file to a personal computer in the "Recording File Reading" screen.



Displayed items

| Item | Description |
|---|--|
| (1) Display Target | Select the checkbox of a recording setting to be displayed in "reading target." |
| (2) Reading target | A recording file which is saved in a recording setting selected in "Display Target" is displayed. |
| (3) [Select All]/[Deselect All] buttons | <ul style="list-style-type: none"> • [Select All] button: Click this to select the checkboxes of all recording files in "reading target." • [Deselect All] button: Click this to unselect the checkboxes of all recording files in "reading target." |
| (4) [Refresh] button | Click this to acquire a list of recording files from a connected module. (Up to 1000 files) |
| (5) [Size Calculation] button | Click this to display the size of a recording file.*1 |

| Item | Description |
|--|--|
| (6) Read Logging File of Servo System Recorder | <p>Select the checkbox to read the logging file of servo system recorder from a motion CPU/motion module at the same time as a recording file.</p> <p>Unselect the checkbox not to read a logging file.</p> <p>For details on the servo system recorder, refer to the following:</p> <p> MELSEC iQ-R Motion Controller Programming Manual (Common)</p> <p> MELSEC iQ-R Motion Module User's Manual (Application)</p> |
| (7) Read Project Data | <p>Select the checkbox to read project data used for recording at the same time as a recording file.*2</p> <p>Unselect the checkbox not to read project data.</p> |

*1 The size of a logging file and project data is not included in the displayed size regardless of the selection status of "Read Logging File of Servo System Recorder" and "Read Project Data."

2 Project data is read as a GX Works3 project (.gx3).

Reading a recording file

Operating procedure

1. Select the checkbox of a recording setting in "Display Target."



A recording file saved in the recording setting is displayed in the screen.

2. Select the checkbox of a recording file to be read, and click the [Read to Personal Computer] button.

Point

A video file generated by using a camera recorder module is included in a read recording file.

Precautions

- User authentication is required for reading project data from an RnSFCPU. ( Page 715 Logging on to a CPU module)
- When writing a project whose security version is '2' to a CPU module, project authentication is required to read the project data. ( Page 722 Project authentication)

Reading a logging file of the servo system recorder

A logging file of the servo system recorder can be read from a motion CPU or motion module when reading a recording file.

A logging file is read by connecting to a motion CPU or motion module via a CPU module.

Direct connection to a motion CPU or motion module is not required.

For details on the servo system recorder, refer to the following:

📖 MELSEC iQ-R Motion Controller Programming Manual (Common)

📖 MELSEC iQ-R Motion Module User's Manual (Application)

Operating procedure

1. Select the checkbox of a recording setting in "Display Target."
2. Select the checkbox of a logging file to be read.
3. Select the checkbox of "Read Logging File of Servo System Recorder."
4. Click the [Read to Personal Computer] button.

■ Configuration in which a logging file is read

The following table shows the modules that a logging file can be read from.

| Module type | Module name |
|---------------|---|
| Motion module | RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW |
| Motion CPU | R16MTCPU, R32MTCPU, R64MTCPU |

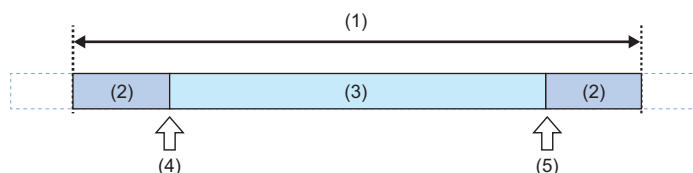
■ Conditions to read a logging file

A logging file related to a recording file selected in the "Recording File Reading" screen is read.

When either of the following conditions is satisfied, a logging file is read as the file related to a recording file:

- The time when a logging file is saved^{*1} is between the recording start and end time of a recording file.
- The time when a logging file is saved^{*1} is within five minutes before the recording start time of a recording file or after the recording end time.

^{*1} Refers to 'date (YYYYMMDD)_time (hhmmss)' in the logging file name.

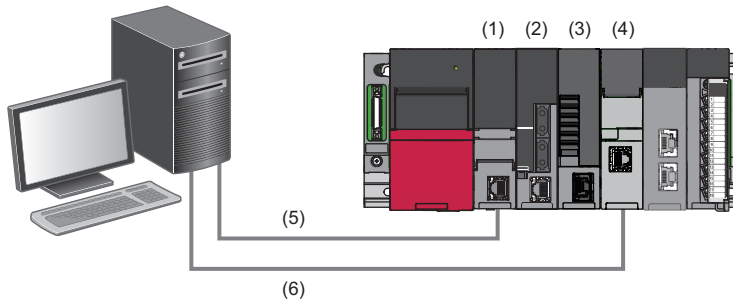


- (1) Time at which a target logging file is saved
 (2) Five minutes
 (3) Recording time of a recording file
 (4) Recording start time of a recording file
 (5) Recording end time of a recording file

■Range to read from a motion CPU or motion module

A logging file can be read from the following motion CPU or motion module that exists on the same base unit as the connected CPU module:

- Motion CPU: CPU No.2 to No.4 in the multiple CPU configuration where the connected CPU module is set as the host CPU.
- Motion module: Motion module controlled by the connected CPU module



- (1) CPU module
- (2) Motion CPU
- (3) Motion module
- (4) Recorder module
- (5) USB cable or Ethernet
- (6) Ethernet

Precautions

- A logging file cannot be read from the motion CPUs or motion modules on an extension base unit and another station.
- A logging file cannot be read when authentication to a CPU module is required to read the file.

Deleting a recording file

A recording file can be deleted from a recorder module or camera recorder module in the "Recording File Reading" screen.

Operating procedure

Select the checkbox of a recording file, and click the [Delete] button.

17.4 Checking Collected Data on Program Editor

Data collected from a programmable controller can be displayed in GX Works3 by using the offline monitor function. It is possible to check control data of when a trouble occurred in the monitor screen even from a remote location and investigate the cause.

For the method for collecting data, refer to the following:

☞ Page 752 Memory Dump Function

☞ Page 756 Data Logging Function

☞ Page 759 Recording Function

R00CPU, RnPSFCPU, and remote head modules do not support the offline monitor function.

Checking memory dump results

Snapshot data saved in a memory dump result file can be displayed in the monitor screen of GX Works3.

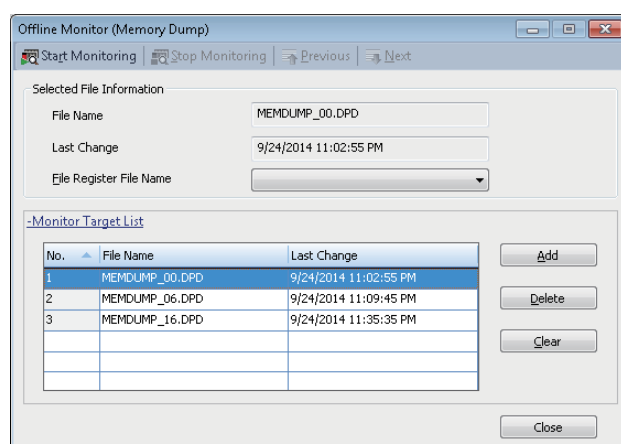
When switching a memory dump result file to be monitored, a monitor value in GX Works3 is changed accordingly.

LHCPU, do not support it.

Selecting a target monitor

Window

Select [Recording] ⇒ [Start Offline Monitor] ⇒ [Memory Dump].



Operating procedure

1. Open a program editor to be monitored.
2. Click the [Add] button on the "Offline Monitor (Memory Dump)" screen.
3. Select the memory dump result file in the "Open File" screen, then click the [Open] button. (Multiple selections allowed.)

Starting offline monitoring

Operating procedure

1. Select a file to monitor from the list on the "Offline Monitor (Memory Dump)" screen, then select [Start Monitoring].
2. Switch a file by selecting [Previous]/[Next] during the offline monitoring.

The device value of the selected file is displayed on the monitor of GX Works3.

■Online operation during offline monitoring

The following online functions are available during offline monitoring:

- Monitor on a program editor
- Device/buffer memory batch monitor
- Watch

Stopping offline monitoring

Operating procedure

Select [Stop Monitoring] on the "Offline Monitor (Memory Dump)" screen.

Offline monitoring is all stopped.

Considerations when monitoring files

■A monitor value cannot be displayed properly

When the following conditions are satisfied, a monitor value is not displayed properly.

| Condition | Displayed value |
|---|---|
| A device value to be monitored does not exist in a selected file. | • Bit device, bit-specified word device: FALSE (0) • Word device, double-word device, FLOAT [Double Precision]: -1 |
| An indirectly specified device is monitored. | |
| An index-modified device is monitored. | A device value excluding the index modification part is displayed. (Example: "D0" is displayed for "D0Z0.") |

■Active status of blocks/steps in an SFC program

Active status is not displayed on an SFC diagram editor.

All blocks are displayed as "Uncreated Block" on all SFC blocks batch monitor.

Checking logging data

Data values collected with the data logging function can be monitored in GX Works3.

This function only supports a logging file (*.bin) acquired from a CPU module.

The screens where this function is available are only as follows:

- Program editors (ladder (including a Zoom), ST, and FBD/LD)
- Device/buffer memory batch monitor
- Watch window

Applicable devices

For devices that can be monitored offline, refer to the following:

 Page 769 Applicable devices

Starting offline monitoring

Operating procedure

1. Open a project to be monitored.
2. Select [Recording] ⇒ [Start Offline Monitor] ⇒ [Logging File].
3. Select a logging file (*.bin), then click the [Open] button.
4. Click a button by following a displayed message.

The "Seek Bar" window appears and offline monitoring is started. ( Page 773 Operating the seek bar)

For displaying data in a waveform in GX LogViewer, refer to the following:

 Page 784 Displaying waveform data

Restriction

Multiple error messages may appear if starting offline monitoring while either of the following windows is displayed:



- Device/buffer memory batch monitor
- Intelligent function module monitor
- Program list monitor
- Interrupt program list monitor

However, the shown errors do not affect offline monitoring.

Click the [OK] button to close the error messages.

■ Display of a device/label not to be sampled

The monitor value of a device/label which is not specified as a sampling target in the data logging function is displayed as shown below.

| Monitor value | Display example ^{*1} |
|--|---|
| Bit device Bit type label |  |
| Word device Double-word device Word type label |  |

^{*1} The monitor value is displayed in the color set for "Non-monitoring Information" in the "Color and Font" screen. (Default: Gray)

Stopping offline monitoring

Operating procedure

Select [Recording] ⇒ [Stop Offline Monitor].
Monitoring is stopped in all screens in GX Works3, and the "Seek Bar" window is closed. (📖 Page 773 Operating the seek bar)

Considerations

■Data type and output type of a logging file

When setting the data logging function, match the type between a data type and output type.
If the data type and output type of a logging file (*.bin) to be monitored do not match, data may not be monitored properly.
For the setting method of the data logging function, refer to the following:
📖MELSEC iQ-R CPU Module User's Manual (Application)

■Monitoring a macro type function block

Input/output labels of a macro type function block cannot be monitored.

■Duplicate devices

When multiple same devices exist in a logging file (*.bin), the value of the device which has the earliest "No." in the "Data" setting screen of CPU Module Logging Configuration Tool is displayed in the monitor screen of GX Works3.

■A monitor value cannot be displayed properly

When the following conditions are satisfied, a monitor value may not be displayed properly.
Check settings.

| Condition | Displayed monitor value |
|---|--|
| An unrecorded device/label is monitored. | An indefinite value is displayed. |
| A project used for monitoring is different from the one which was written in a CPU module when data was output. | The following possibilities can be considered: <ul style="list-style-type: none">• The monitor value of a device/label does not match with the parameters being monitored or the device/label status in a program.• The data type of a device/label monitor value is different. |

■Data protected by security

A POU locked with a security key or block password is not displayed.

■Monitoring a file saved on a network drive

Offline monitoring may be stopped if a file cannot be accessed due to an error such as a network disconnection during offline monitoring.

■File saved on a removable media

To start offline monitoring, save a file to a personal computer first, then open it.

Checking a recording file

Data values collected with the recording function can be monitored in GX Works3.

RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU), RnENCPU, and RnSFCPU support this monitoring.

The screens where this function is available are only as follows:

- Program editor
- Device/buffer memory batch monitor
- Watch window
- SFC block list monitor^{*1}
- SFC all blocks batch monitor^{*1}

^{*1} RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU), RnENCPU support it.

Applicable devices

The following shows devices that can be monitored offline.

| Device |
|---|
| X, Y, M, L, B, F, SB, V, T, ST, LT, LST, C, LC, D, W, SW, SM, SD, J□\X, J□\Y, J□\B, J□\SB, J□\W, J□\SW, U□\G, U3E□\G, U3E□\HG, Z, LZ, R, ZR, RD, BL ^{*1} , BL□\S, #M, #V, #T, #ST, #LT, #LST, #C, #LC, #D, SA\X, SA\Y, SA\M, SA\B, SA\T, SA\ST, SA\C, SA\D, SA\W, SA\SM, SA\SD |

^{*1} Only data collected with the recording function can be monitored.

Precautions

Index-modified devices and indirectly specified devices cannot be monitored.

Starting offline monitoring

Operating procedure

1. Select [Recording] ⇒ [Start Offline Monitor] ⇒ [Recording File].
2. Select a recording file (*.melrc), then click the [Open] button.
3. Click a button by following a displayed message.

The "Seek Bar" window appears and offline monitoring is started. (☞ Page 773 Operating the seek bar)

For displaying data in a waveform in GX LogViewer, refer to the following:

☞ Page 784 Displaying waveform data

Restriction

Multiple error messages may appear if starting offline monitoring while either of the following windows is displayed:

- Device/buffer memory batch monitor
- Intelligent function module monitor
- Program list monitor
- Interrupt program list monitor

However, the shown errors do not affect offline monitoring.

Click the [OK] button to close the error messages.

Point



A video file included in a recording file can be played in GX VideoViewer.

For details on GX VideoViewer, refer to the following.

☞ GX VideoViewer Version 1 Operating Manual

■Display of a device/label not to be sampled

The monitor value of a device/label which is not specified as a sampling target in the recording function is displayed as shown below.

| Monitor value | Display example*1 |
|--|---|
| Bit device Bit type label |  |
| Word device Double-word device Word type label |  |

*1 The monitor value is displayed in the color set for "Non-monitoring Information" in the "Color and Font" screen. (Default: Gray)

Precautions

- Using project data that is read at the same time as a recording file is recommended.
For the method to read project data and a recording file at the same time, refer to the following:
☞ Page 761 Reading/deleting a recording file
- When monitoring a recording file including more than 5,232,645 records, the 5,232,646th and older records are not displayed.
- A project saved in a recording file cannot be opened in GX Works3 started from MELSOFT Navigator. Start offline monitoring with a project currently opened in GX Works3.
To use a project saved in a recording file, do not start offline monitoring in GX Works3 started from MELSOFT Navigator but in the standalone GX Works3.
- When a recording file is saved in a file server by the following recorder module or camera recorder module, open the project used when the recording setting was written to a CPU module, then start offline monitoring.
 - Recorder module with the firmware version '03' or '04'
 - Camera recorder module with the firmware version '01'

Stopping offline monitoring

For details on the operating procedure, refer to the following:


☞ Page 768 Stopping offline monitoring

When stopping offline monitoring, monitoring is stopped in all screens in GX Works3, and the "Seek Bar" window and the "Event History (Offline Monitor)" window are closed.

Considerations

The following shows the considerations for checking a recording file.

For considerations common to logging data, refer to the following:

 Page 768 Considerations

■Devices that cannot be monitored

- Index registers (Z) and long index registers (LZ) cannot be monitored if a recording file satisfies the following conditions: it links to the recording setting written to a CPU module in GX Works3 Version 1.065T or 1.066U, and it does not have project data read at the same time.
- Local index registers cannot be monitored offline.

■Indefinite value


When monitoring an unrecorded device/label, an indefinite value may be displayed.

Whether a recorded device/label is actually being monitored can be checked in the "Recording Setting" screen.

For details on the "Recording Setting" screen, refer to the following:

 MELSEC iQ-R System Recorder User's Manual (Application)

■Monitoring a recording file that includes a safety project

A safety project included in a recording file is opened without user authentication and logged on as a guest user. ( Page 708 Guest user)

Note the following:

- Even if a guest user is not added to a project, user authentication is skipped and the project is opened as a guest user.
- User authentication of a safety project included in a recording file cannot be performed again.
- When saving a safety project included in a recording file, a password for user authentication is not set for the saved project; therefore, the project can be logged on only as a guest user.

■Monitoring a recording file in an SFC diagram editor

The following monitors are not available:

- SFC auto-scroll
- SFC-activated step monitor

For considerations during monitoring, refer to the following:

 Page 647 Monitoring an SFC diagram

■Monitoring a step relay with block specification

When monitoring a step relay with block specification (BL□\S) that satisfies all the following conditions, a monitor value is displayed as 'TRUE,' and the active status of steps is displayed as 'Activated.'

- A step relay with block specification (BL□\S) is not used in an SFC program.
- A step relay with block specification (BL□\S) is collected from "Specify from the Device/Label List" or "Specify the Device Range" in a recording setting.

Operating the seek bar

The "Seek Bar" window appears when starting offline monitoring.

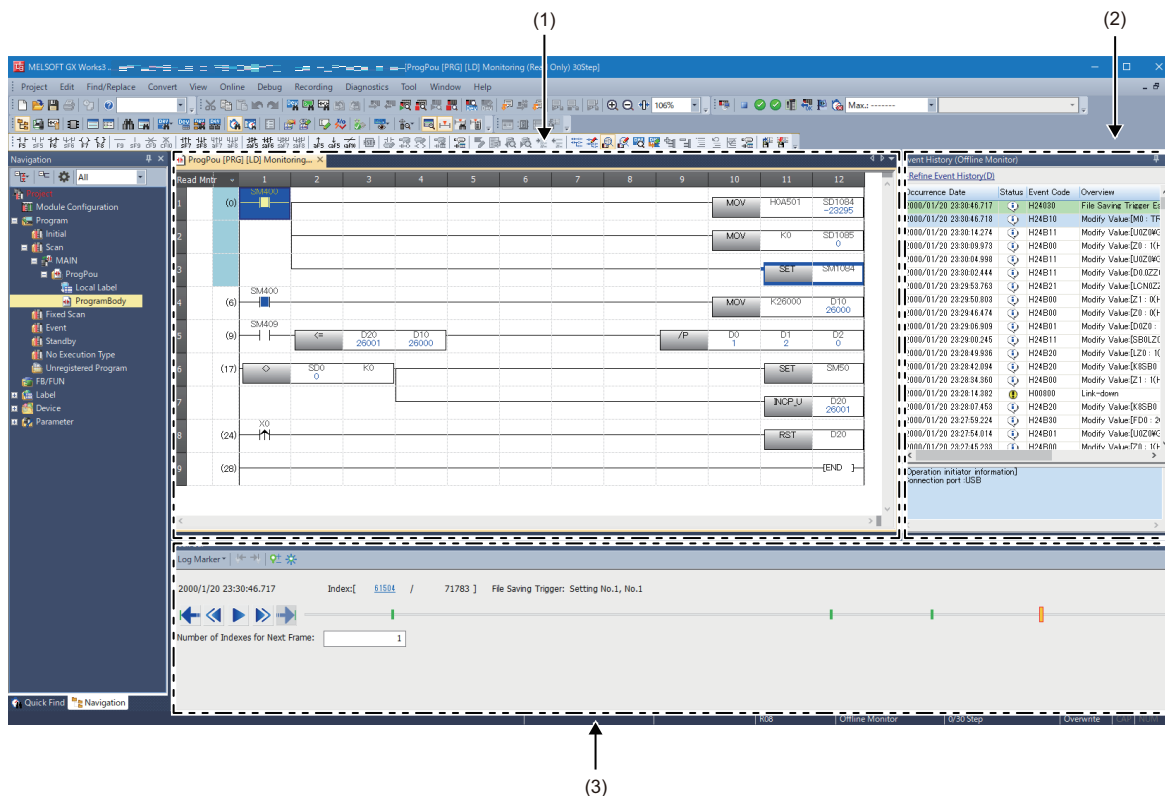
The seek bar is a function which specifies the index (sequential serial number recorded in a recording file in each scan) of data to be monitored.

An index specified with the seek bar or a monitor value at the index can be displayed in a monitor screen, "Event History (Offline Monitor)" window, and GX LogViewer which are linking with the seek bar.

Screen configuration

Window

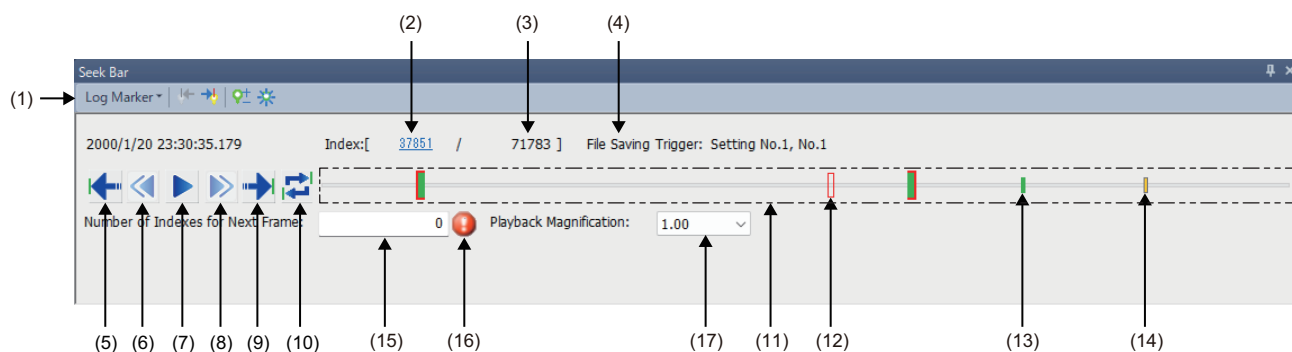
Select [Recording] ⇒ [Start Offline Monitor] ⇒ [Recording File]/[Logging File].



Displayed items


| Item | Description |
|--|---|
| (1) Monitor screen of a program editor | Check data collected from a programmable controller. |
| (2) "Event History (Offline Monitor)" window | Check event information stored in a recording file being monitored. For details, refer to the following: ☞ Page 779 Checking an event history (offline monitor) |
| (3) "Seek Bar" window | Specify an index by moving the slider on the seek bar. |

■ Seek bar







Displayed items

| Item | | Description | |
|-----------------------------|------------------------|---|---|
| (1) Toolbar | Log Marker | Read | Select this to read a log marker information file (*.lms, *.lmcs, *.vms). (☞ Page 778 To read a specified log marker information file) |
| | | Read from GX VideoViewer | Select this to read log markers added to a video file. (☞ Page 778 To read log markers in a video file) |
| | | Edit Comment/Color | Select this to perform either of the following operations to a log marker: <ul style="list-style-type: none"> Adding a comment (☞ Page 777 Editing a comment/color) Changing a color (☞ Page 777 Editing a comment/color) |
| | Previous Trigger | | Click this to move the slider to the previous trigger position. |
| | Next Trigger | | Click this to move the slider to the next trigger position. |
| | Add/Delete Log Marker | | Click this to add or delete a log marker. (For adding: ☞ Page 777 Adding a log marker, for deleting: ☞ Page 777 Deleting a log marker) |
| | Delete All Log Markers | | Click this to delete all log markers on the seek bar. |
| (2) Current index | | A current index of data being monitored is displayed. The "Specify Index to Display" screen appears by clicking this item. | |
| (3) Total number of records | | The total number of records being monitored is displayed. | |
| (4) File Saving Trigger | | The following information is displayed: <ul style="list-style-type: none"> Recording setting in which a file saving trigger is set Setting number of a file saving trigger setting The above information is not displayed for a logging file or a recording file that satisfies any of the following conditions: <ul style="list-style-type: none"> "Recording Startup Trigger + File Saving Trigger" is set for "Recording Method," and a file is saved after specified time elapses from recording completion. A file is saved by a camera event. A file is saved by detecting a CPU stop error. A file is saved in the recording monitor screen. | |
| (5) Previous Log Marker | | Click this to move the slider to the previous log marker. | |
| (6) Previous Frame | | Click this to move the index to the previous frame for the setting value in "Number of Indexes for Next Frame." The slider moves according to the index. | |
| (7) Play/Pause | | Click this to play (forward) or pause a recording file and logging file. (Pause) is displayed while playing a file. (Play) is displayed while pausing a file. | |
| (8) Next Frame | | Click this to move the index to the next frame for the setting value in "Number of Indexes for Next Frame." The slider moves according to the index. | |
| (9) Next Log Marker | | Click this to move the slider to the next log marker. | |
| (10) Loop playback | | The state for loop playback can be switched. <ul style="list-style-type: none"> (Loop all): Click this to loop the whole data. (Loop between log markers): Click this to loop the data between log markers placed previous and next the slider. (Loop playback OFF): Click this to turn OFF the loop playback. | |
| (11) Seek bar | | A range where the slider can move is indicated. | |
| (12) Slider | | A current index of data being monitored is indicated. This item is displayed in red on the seek bar. By dragging the slider to the left or right, it can be moved to an index at which the monitor value is to be checked. | |

| Item | Description |
|--|---|
| (13) Log marker | A position where a log marker is added is indicated. This item is displayed in a specified color on the seek bar. (Default color: green) |
| (14) Trigger position marker | A position where a trigger occurs is indicated. This item is displayed in yellow on the seek bar. |
| (15) Number of Indexes for Next Frame | Set the value to move the index in "Previous Frame"/"Next Frame." The minimum value/maximum value that can be set are as follows: <ul style="list-style-type: none"> • Minimum value: 1 • Maximum value: Maximum index value -1 |
| (16)  Error | This icon is displayed when the setting value in "Number of Indexes for Next Frame" is invalid. |
| (17) Playback Magnification | Set the magnification (speed) to play a recording file and logging file. The playback magnification cannot be changed while playing the file. |

Point

- The slider moves to the left or right by pressing the  +  /  +  keys.
- If a logging file (*.bin) does not contain time information, "-" is displayed for the time information in the "Seek Bar" window.

■Specifying an index manually

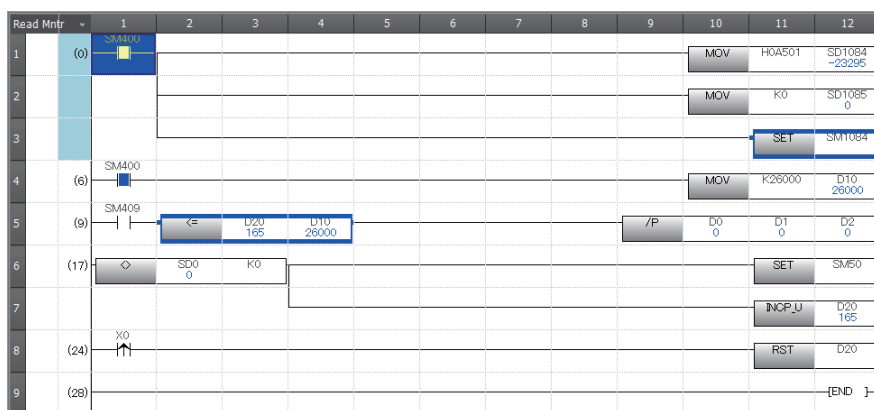
An index can be specified manually by dragging the slider to the left or right, or alternatively by the following procedure.

Operating procedure

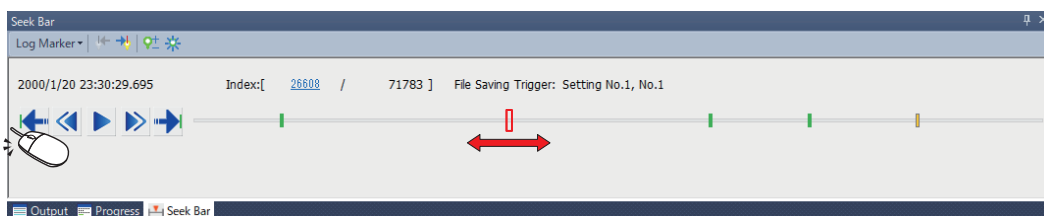
1. Click a current index in the "Seek Bar" window.
2. Enter an index in the "Specify Index to Display" screen, and click the [OK] button.

Function linking with the seek bar

The move of slider on the seek bar links with each editor, "Event History (Offline Monitor)" window, and GX LogViewer.



Slider movement is reflected in an editor being monitored offline.

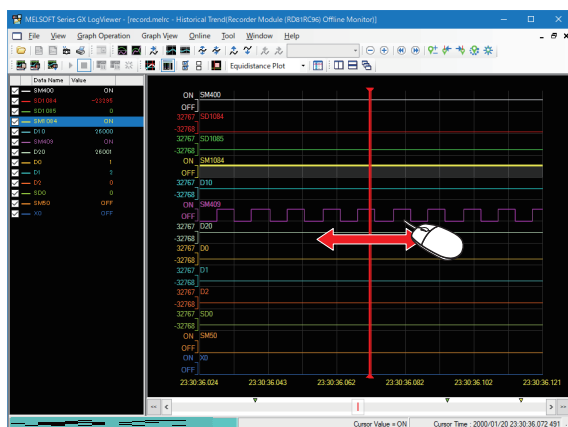


As the slider is moved, the red cursor moves.

As the red cursor is moved, the slider moves.

As the slider is moved, the cursor moves to the event at a specified index.

As an event is selected, the slider moves to the corresponding index.




| Occurrence Date | Status | Event Code | Overview | Start I/O N... |
|-------------------------|--------|------------|---|----------------|
| 2000/01/04 02:53:21.287 | ↓ | H24C10 | Modify Value[ProcPos/Lab01 : TR... | SE00 |
| 2000/01/04 02:53:18.712 | ↓ | H24C10 | Modify Value[Dm0 : TRUE] | SE00 |
| 2000/01/04 02:53:17.000 | ↓ | H24C10 | Modify Value[ProcPos/Lab01 : TR... | SE00 |
| 2000/01/04 02:53:05.629 | ↓ | H24B10 | Modify Value[Dm0 : FALSE] | SE00 |
| 2000/01/04 02:53:04.599 | ↓ | H24C10 | Modify Value[ProcPos/Lab01 : FA... | SE00 |
| 2000/01/04 02:53:02.770 | ↓ | H24B10 | Modify Value[Dm0 : FALSE] | SE00 |
| 2000/01/04 02:52:59.808 | ↓ | H24B10 | Modify Value[Dm0 : TRUE] | SE00 |
| 2000/01/04 02:52:58.206 | ↓ | H24C10 | Modify Value[ProcPos/Lab01 : TR... | SE00 |
| 2000/01/04 02:52:21.261 | ↓ | H24B08 | File Saving Trigger Establishment | RD01RC06 |
| 2000/01/04 02:52:21.260 | ↓ | H24C20 | Recording Operation Start | RD01RC06 |
| 2000/01/04 02:52:17.280 | ↓ | H24100 | Operating status change (RUN) | RA0CPU |
| 2000/01/04 02:52:15.239 | ↓ | H24101 | Operating status change (STOP) | RA0CPU |
| 2000/01/04 02:51:57.805 | ↓ | H00400 | Power-on and reset | RA0CPU |
| 2000/01/04 02:51:46.898 | ↓ | H00420 | Event history file generation | RA0CPU |
| 2000/01/04 02:51:46.553 | ↓ | H24200 | Creation of new folders, writes to fil... | RA0CPU |
| 2000/01/04 02:51:45.843 | ↓ | H24200 | Creation of new folders, writes to fil... | RA0CPU |
| 2000/01/04 02:51:45.314 | ↓ | H24200 | Creation of new folders, writes to fil... | RA0CPU |
| 2000/01/04 02:51:45.224 | ↓ | H24200 | Creation of new folders, writes to fil... | RA0CPU |
| 2000/01/04 02:51:04.442 | ↓ | H24010 | SD Memory Card Initialization | RD01RC06 |
| 2000/01/04 02:50:44.450 | ↓ | H24200 | Memory initialization | RA0CPU |

Adding a log marker

During offline monitoring, a log marker can be added to any index by using the log marker function. Up to 100 log markers can be added to a unit of data (a recording file or logging file).


Adding a log marker

Operating procedure

1. Move the slider to any index on the seek bar.
2. Click  (Add/Delete Log Marker).

Deleting a log marker

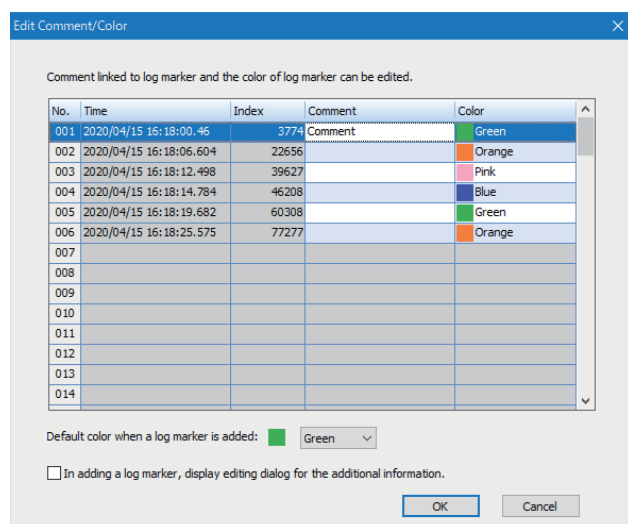
Operating procedure

1. Move the slider to any log marker on the seek bar.
2. Click  (Add/Delete Log Marker).

Editing a comment/color

Window

Select [Log Marker] ⇒ [Edit Comment/Color] on the toolbar in the "Seek Bar" window.



| No. | Time | Index | Comment | Color |
|-----|-------------------------|-------|---------|--------|
| 001 | 2020/04/15 16:18:00.46 | 3774 | Comment | Green |
| 002 | 2020/04/15 16:18:06.604 | 22656 | | Orange |
| 003 | 2020/04/15 16:18:12.498 | 39627 | | Pink |
| 004 | 2020/04/15 16:18:14.784 | 46208 | | Blue |
| 005 | 2020/04/15 16:18:19.682 | 60308 | | Green |
| 006 | 2020/04/15 16:18:25.575 | 77277 | | Orange |
| 007 | | | | |
| 008 | | | | |
| 009 | | | | |
| 010 | | | | |
| 011 | | | | |
| 012 | | | | |
| 013 | | | | |
| 014 | | | | |

Default color when a log marker is added: ■ Green

☐ In adding a log marker, display editing dialog for the additional information.

OK Cancel

Displayed items

| Item | Description |
|--|--|
| Comment | Add a comment for a log marker. The added comment is displayed by placing the mouse cursor on the log marker. |
| Color | Change the color of a log marker. |
| Default color when a log marker is added | Set the default color of a new log marker. |
| In adding a log marker, display editing dialog for the additional information. | Select this checkbox to display the "Edit Comment/Color" screen every time adding a log marker. |

Operating procedure

1. Add a comment (up to 256 characters) in the "Comment" column for a log marker.
2. Select a color for the log marker from the pull-down list of "Color."
3. Click the [OK] button.

Reading a log marker information file

Log markers added to data are saved as a log marker information file in a folder where a recording file or logging file is stored. The extension of a log marker information file differs depending on the tool used to add log markers.

| Extension | Tool | Version of the tool |
|-----------|----------------|---------------------------|
| *.lms | GX Works3 | Version 1.065T and 1.066U |
| | GX LogViewer | Version 1.106K |
| *.lmcs | GX Works3 | Version 1.070Y or later |
| | GX LogViewer | Version 1.112R or later |
| *.vms | GX VideoViewer | Version 1.006G or later |

When selecting data that includes a log marker information file (*.lms, *.lmcs) and starting offline monitoring, log markers are automatically read and displayed on the seek bar.

Alternatively, log markers can be read by following the procedure below.

Operating procedure

■To read a specified log marker information file

1. Click [Log Marker] ⇒ [Read] on the toolbar in the "Seek Bar" window.
2. Select a log marker information file (*.lms, *.lmcs, *.vms) and click the [Open] button.

■To read log markers in a video file

Click [Log Marker] ⇒ [Read from GX VideoViewer] on the toolbar in the "Seek Bar" window.

Either of the following is read: log markers in a video file that is opened in GX VideoViewer, or a log marker information file (*.vms) that is included in a recording file monitored offline.

Precautions

- Log marker information files (*.lmcs) created in GX Works3 Version 1.070Y or later and GX LogViewer Version 1.112R or later cannot be opened in GX Works3 Version 1.065T and 1.066U.
- Even if a log marker information file is read, the comments and colors of log markers that are already added will not be overwritten.

Linking with GX LogViewer

While monitoring same data at the same time in GX Works3 and GX LogViewer, log markers added, deleted, or edited in one tool are reflected in the other tool.


For details on the log marker function of GX LogViewer, refer to the following:

 GX LogViewer Version 1 Operating Manual

The following table shows the method to synchronize log markers between each version of GX Works3 and GX LogViewer.

| GX Works3 | GX LogViewer | Synchronization method |
|---------------------------|-------------------------|---|
| Version 1.065T and 1.066U | Version 1.106K | Read a log marker information file (*.lms) in the application destination tool. |
| Version 1.070Y or later | Version 1.112R or later | Log markers are automatically synchronized. (No operation is required.) |

Linking with GX VideoViewer

Log markers added to a video file can be applied to a recording file or logging file by reading a log marker information file (*.vms) of GX VideoViewer in GX Works3. ( Page 778 To read log markers in a video file)

In addition, log markers added in GX Works3 can be displayed in GX VideoViewer.

For details on the log marker function of GX VideoViewer, refer to the following:

 GX VideoViewer Version 1 Operating Manual

Consideration

The log marker function is not available if a logging file does not contain time information.

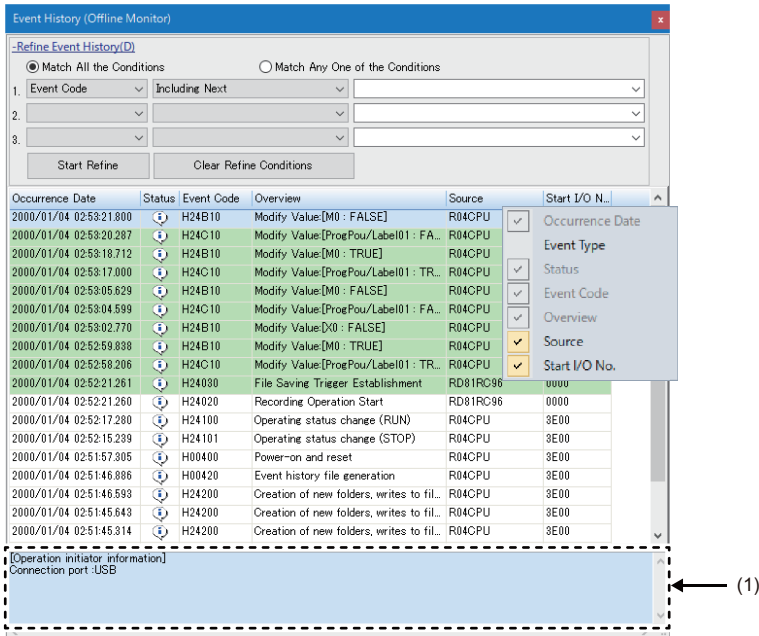
Checking an event history (offline monitor)

The following event information that is stored in a recording file during monitoring can be checked: error information, operation history, system information, and change history of a current value.

RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU), RnENCPU, and RnSFCPU support this function.

Window

Select [View] ⇒ [Docking Window] ⇒ [Event History (Offline Monitor)].



(1): Event details

Event information which can be specified with the seek bar is displayed with a pale green background.

■Status icon legend

| Status icon | |
|-------------|----------------|
| | Major error |
| | Moderate error |
| | Minor error |
| | Warning |
| | Information |

Operating procedure

1. Start offline monitoring. (☞ Page 769 Starting offline monitoring)
2. Place the cursor on any event information in the "Event History (Offline Monitor)" window, and check the event details.

■Event history sorting

Events can be sorted in ascending/descending order by clicking each column header.

■Event history refinement

Events can be refined by setting a condition for ones to be displayed.

Click "Refine Event History" to set a condition.

The operations are the same as that in the "Event History" screen. (☞ Page 749 Event history refinement)

However, unlike in the "Event History" screen, single-byte and double-byte characters are distinguished in searching for an event.

■Linking with the seek bar

Event information at a specified index can be checked by operating the slider on the seek bar.

In addition, by selecting event information with a pale green background, the slider on the seek bar is moved to the corresponding index, and a monitor value at the index is displayed in the monitor screen.

Precautions

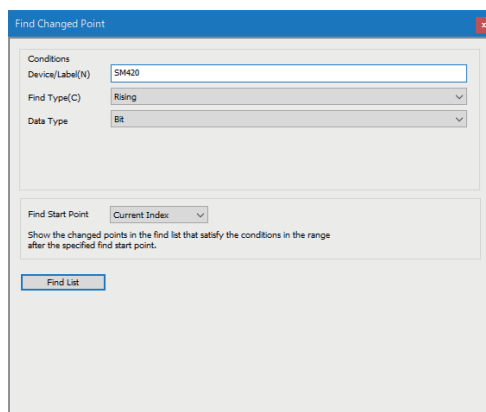
- If a recording file does not contain an event history, the "Event History (Offline Monitor)" window does not appear even when offline monitoring is started.
- When linking with the seek bar, the following cases may occur:
 - An occurrence date of event information and a date displayed in the "Seek Bar" window are different in milliseconds.
 - Even if selecting event information with a pale green background, the slider on the seek bar is not moved to the corresponding index.
- If the time setting in a programmable controller is changed while updating an event history or recording, the background color of event information may not be displayed in pale green.

Checking a device/label value

During offline monitoring, devices/labels that match specified conditions can be searched for. In addition, the date and time and indexes when their values changed can be displayed.

Window

Select [View] ⇒ [Docking Window] ⇒ [Find Changed Point(Offline Monitor)]/[Changed Point List(Offline Monitor)].



"Find Changed Point" window

| Date | Index | SM420 | Find Target Value | Comparison Target... |
|------------------------|-------|-------|-------------------|----------------------|
| 2021/6/22 11:30:52.813 | 1758 | | TRUE | |
| 2021/6/22 11:30:52.876 | 1963 | | TRUE | |
| 2021/6/22 11:30:52.939 | 2168 | | TRUE | |
| 2021/6/22 11:30:53.001 | 2373 | | TRUE | |
| 2021/6/22 11:30:53.064 | 2578 | | TRUE | |
| 2021/6/22 11:30:53.127 | 2783 | | TRUE | |
| 2021/6/22 11:30:53.189 | 2988 | | TRUE | |
| 2021/6/22 11:30:53.252 | 3193 | | TRUE | |
| 2021/6/22 11:30:53.314 | 3398 | | TRUE | |
| 2021/6/22 11:30:53.377 | 3603 | | TRUE | |
| 2021/6/22 11:30:53.440 | 3808 | | TRUE | |
| 2021/6/22 11:30:53.502 | 4013 | | TRUE | |
| 2021/6/22 11:30:53.565 | 4218 | | TRUE | |
| 2021/6/22 11:30:53.628 | 4423 | | TRUE | |
| 2021/6/22 11:30:53.690 | 4628 | | TRUE | |
| 2021/6/22 11:30:53.753 | 4833 | | TRUE | |
| 2021/6/22 11:30:53.815 | 5038 | | TRUE | |
| 2021/6/22 11:30:53.878 | 5243 | | TRUE | |
| 2021/6/22 11:30:53.941 | 5448 | | TRUE | |
| 2021/6/22 11:30:54.003 | 5653 | | TRUE | |

"Changed Point List" window

| Item | Description |
|-------------------------------|---|
| Jump to the Current Location | Click this to move the slider on the seek bar to the index of a selected changed point. |
| Jump to the Previous Location | Click this to move the slider on the seek bar to the index of the changed point that is one above a selected one. |
| Jump to the Next Location | Click this to move the slider on the seek bar to the index of the changed point one below a selected one. |
| Clear All | Click this to clear the search results. |

Point

The "Find Changed Point" window appears also by right-clicking in any of the following editors or in a watch window and selecting [Find Changed Point] from the shortcut menu:

- Ladder editor
- Inline structured text box in a ladder editor
- FBD/LD editor
- ST editor
- SFC diagram editor

When selecting a device/label in an editor or in a watch window, the device/label is automatically entered in the "Device/Label" column of the "Find Changed Point" window.

Operating procedure

1. Set conditions and the start point of search in the "Find Changed Point" window.
2. Click the [Find List] button.
3. Double-click a search result displayed in the "Changed Point List" window.

The slider on the seek bar moves to the index of the selected search result, and the monitor value at the index is applied to each screen that is linking with the seek bar.

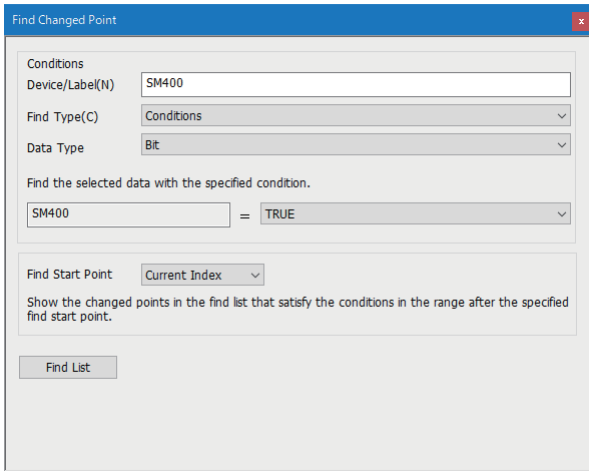
Point

By selecting "Yes" for the following option, when entering a common device comment or a label comment, devices and labels for which the comment has been set can be displayed as options.

- [Tool] ⇒ [Options] ⇒ "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Corresponding Device in Entering Device Comment"

■ Search type

The following table shows the details on the options that can be set for "Find Type" in the "Find Changed Point" window.

| Item | Description | Target data type |
|---------------------|--|--|
| Rising | Indexes at which a device/label is turned from OFF to ON are searched for. | Bit |
| Falling | An index at which a device/label is turned from ON to OFF for the first time is searched for. | Bit |
| Rising/Falling | Indexes at which a device/label is turned from OFF to ON or from ON to OFF are searched for. | Bit |
| Maximum value | An index at which a device/label has the maximum value is searched for. | <ul style="list-style-type: none"> • Word • Double Word • FLOAT [Single Precision] • FLOAT [Double Precision] |
| Minimum value | An index at which a device/label has the minimum value is searched for. | <ul style="list-style-type: none"> • Word • Double Word • FLOAT [Single Precision] • FLOAT [Double Precision] |
| Local maximum value | Indexes at which a device/label has a local maximum value are searched for. A local maximum value refers to a value of a device/label at the point where the value that has been increasing starts to decrease. | <ul style="list-style-type: none"> • Word • Double Word • FLOAT [Single Precision] • FLOAT [Double Precision] |
| Local minimum value | Indexes at which a device/label has a local minimum value are searched for. A local minimum value refers to a value of a device/label at the point where the value that has been decreasing starts to increase. | <ul style="list-style-type: none"> • Word • Double Word • FLOAT [Single Precision] • FLOAT [Double Precision] |
| Conditions | Indexes at which a specified condition is satisfied are searched for.  | <ul style="list-style-type: none"> • Bit • Word • Double Word • FLOAT [Single Precision] • FLOAT [Double Precision] |

| Item | Description | Target data type |
|---|---|--|
| Compare value between device and label name | <div>Indexes at which a condition specified for the value between a device/label and comparison data is satisfied are searched for.</div> <div><div>Find Changed Point</div><div><div>Conditions</div><div>Device/Label(N)<div>SM400</div></div><div>Find Type(C)<div>Compare value between device and label name</div></div><div>Data Type<div>Bit</div></div><div>Find the selected data with the specified condition.</div><div><div>SM400</div><div>=</div><div>SM409</div></div><div><div>Find Start Point</div><div>Current Index</div></div><div>Show the changed points in the find list that satisfy the conditions in the range after the specified find start point.</div><div>Find List</div></div></div> | <div><div>• Bit</div><div>• Word</div><div>• Double Word</div><div>• FLOAT [Single Precision]</div><div>• FLOAT [Double Precision]</div></div> |

■Sorting search results

Search results can be sorted in ascending/descending order by clicking each column header in the "Changed Point List" window.

■Copying search results

Search results can be copied by pressing the  +  keys in the "Changed Point List" window.

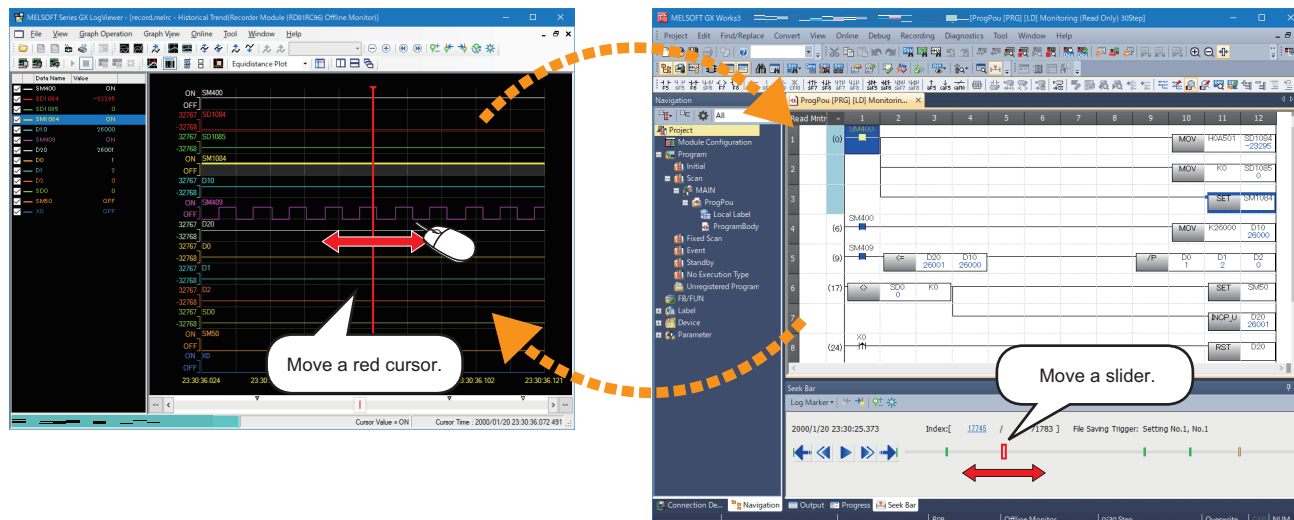
Displaying waveform data

A device/label selected in the monitor screen of the offline monitor function can be displayed in a graph format in GX LogViewer.

To use this function, GX LogViewer Version 1.106K or later is required to be installed.

For the operation methods of GX LogViewer, refer to the following:

📖 GX LogViewer Version 1 Operating Manual



Starting GX LogViewer

1. Start offline monitoring.

(Logging data: 📖 Page 767 Starting offline monitoring, recording file: 📖 Page 769 Starting offline monitoring)

2. Select a device/label in a program editor, watch window, or "Dataflow Analysis" window.

3. Perform either of the following operations depending on the screen.

- Program editor and watch window: Right-click the device/label and select [Wave Display (Offline Monitor)] from the shortcut menu.
- "Dataflow Analysis" window: Right-click the device/label and select [Monitor] ⇒ [Wave Display (Offline Monitor)] from the shortcut menu.

The "Historical Trend" window of GX LogViewer appears.

Precautions

- In GX LogViewer, up to 32 devices/labels can be displayed at once.
- Only devices that are supported by each logging function can be displayed in a waveform. For the unsupported devices, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

📖 MELSEC iQ-R System Recorder User's Manual (Application)

Point

- When performing step 3 again with another device/label selected after displaying a device/label in a waveform, whether to add the waveform of the selected device/label in the graph that is already displayed or to display it in a new graph can be selected.
- The seek bar in GX Works3 and the red cursor in GX LogViewer link with each other. The red cursor in GX LogViewer moves when moving the slider on the seek bar in GX Works3, and vice versa.

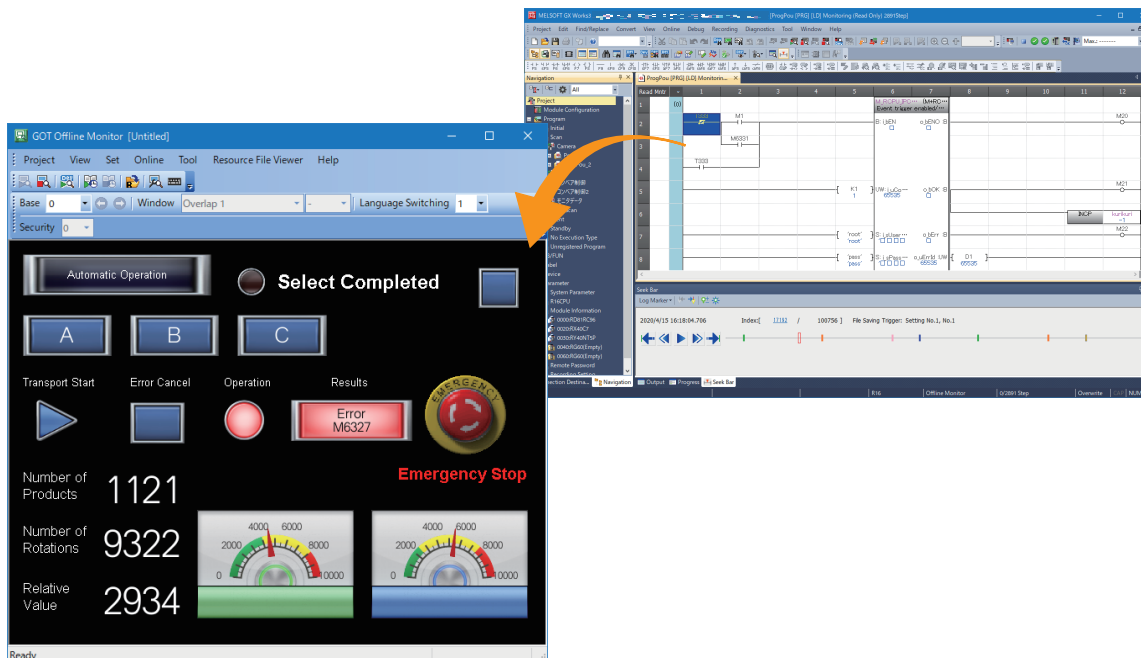
Displaying the GOT offline monitor

Logging data of a device/label selected in the monitor screen of GX Works3 can be displayed in the GOT offline monitor. To use this function, GT Designer3 Version 1.236W or later is required to be installed.

This function does not support a logging file.

For the operation methods of GT Designer3, refer to the following:

📖 GT Designer3 (GOT2000) Screen Design Manual



Starting the GOT offline monitor

Operating procedure

1. Select a recording file, and start offline monitoring. (📖 Page 769 Starting offline monitoring)
2. Select [Recording] ⇒ [GOT Offline Monitor] ⇒ [Start].
3. Select a GT Designer3 project file, and click the [Open] button.

Stopping the GOT offline monitor

Operating procedure

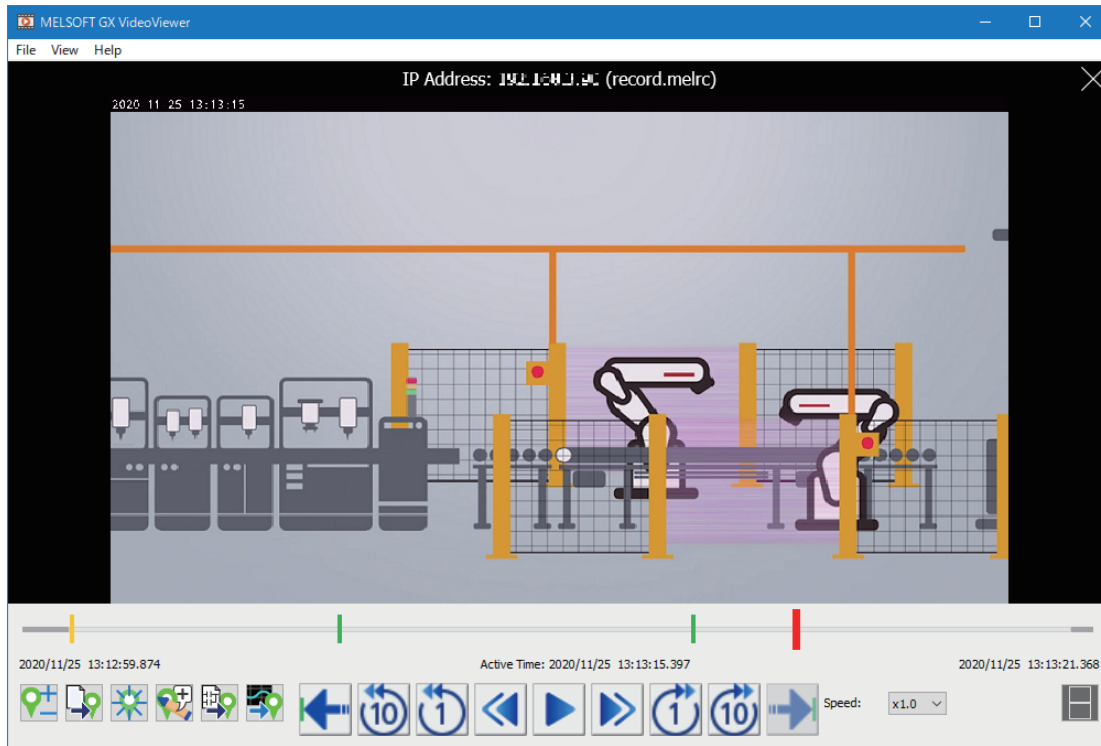
Select [Recording] ⇒ [GOT Offline Monitor] ⇒ [End].

Playing a video

A video file generated by using a camera recorder module or Camera Recording Package can be played in GX VideoViewer. To use this function, GX VideoViewer is required to be installed.



For the operation methods of GX VideoViewer, refer to the following:

 GX VideoViewer Version 1 Operating Manual



Starting GX VideoViewer

Operating procedure

1. Start offline monitoring.
(Logging data:  Page 767 Starting offline monitoring, recording file:  Page 769 Starting offline monitoring)
2. Select [Tool] ⇒ [GX VideoViewer].
3. Select a video file and click the [Open] button.

18 CHECKING/CHANGING MODULE OPERATION

The operation of each module can be checked and changed in GX Works3.

18

CPU module

| Purpose | Function name | Reference |
|---|--|---|
| To set the clock on a CPU module | Clock setting | Page 788 Clock Setting in a CPU Module |
| To switch the operation status of a CPU module connected to GX Works3 to RUN/STOP/PAUSE/RESET | Remote operation | Page 789 Remote Operation |
| To perform the functions of CPU modules in a redundant system configuration | System switching Operation mode change Memory copy Control system forced start while waiting for the other system started Redundant function module communication test System A/B setting | Page 791 Redundant Programmable Controller Operations |
| To perform the functions of RnPSFCPU and RnSFCPU | Safety operation mode switching Identification check for safety data Safety module operation | Page 794 Safety Programmable Controller Operations |
| To check the usage of data memory | CPU memory operation | Page 799 Checking Memory Usage |
| To clear values in data memory | Clear value | Page 801 Initializing/Clearing a Memory |
| To read the label memory To write the read label memory | Label memory read/write | Page 803 Reading/Writing the Label Memory |
| To update the firmware of a module | Firmware update | Page 806 Firmware Update |

Remote head module

| Purpose | Function name | Reference |
|--|----------------------|---|
| To switch the operation status of a remote head module connected to GX Works3 to the RUN/STOP/PAUSE/RESET status | Remote operation | Page 789 Remote Operation |
| To perform the functions of remote head modules in a redundant system configuration | System switching | Page 791 Redundant Programmable Controller Operations |
| To check the usage of data memory | CPU memory operation | Page 799 Checking Memory Usage |
| To clear values in data memory | Clear value | Page 801 Initializing/Clearing a Memory |

Other modules

| Purpose | Function name | Reference |
|------------------------------------|-----------------|--------------------------|
| To update the firmware of a module | Firmware update | Page 806 Firmware Update |

18.1 Clock Setting in a CPU Module

This section explains the setting method of the clock on a CPU module.

Remote head modules do not support this function.

Window

Select [Online] ⇒ [Set Clock].

Operating procedure

Set the following items and click the [Execute] button.

| Execution target | Description |
|--------------------------------------|---|
| Currently Specified Station | Select this to set the clock only upon the station specified in the connection destination setting. |
| All Stations Specified ^{*1} | Select this to perform the clock setting on the station specified in the connection destination setting and all the stations on the same network. Set a target network with "Specify Target Network No.". |
| Specify Group No. ^{*1} | Select this to perform the clock setting on the station specified in the connection destination setting and each station of the specific group on the specified network. Set a target network in "Specify Target Network No.", and set a group number in "Specify Group No.". The clock setting cannot be performed for CC-Link IE Field Network because it does not have group number. |

^{*1} FX5CPUs do not support it.

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.

An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|---|
| Backup mode | Applied to both systems (order: control system → standby system). |
| Separate mode | Applied to the CPU module in the connective system. |

Precautions

- The clock in a CPU module can be set regardless of the ON/OFF state of the clock setting device 'SM210.'
Note that the ON/OFF state of 'SM210' does not change upon the clock setting.
- In the clock setting, a time-lag may occur due to the transfer time.
- The same time is set even if different time zones are specified between a connected station and another station.

18.2 Remote Operation

This section explains the method for switching the operating status (RUN/STOP/PAUSE/RESET) of a CPU module and remote head module with their RUN/STOP/RESET switches placed in the RUN position.

Use this function to change the status of a CPU module to RUN/STOP with an external signal when the module is located in an inaccessible place such as in the control panel.

To change the status to RESET by a remote operation, the remote reset needs to be enabled in the CPU parameter in advance.

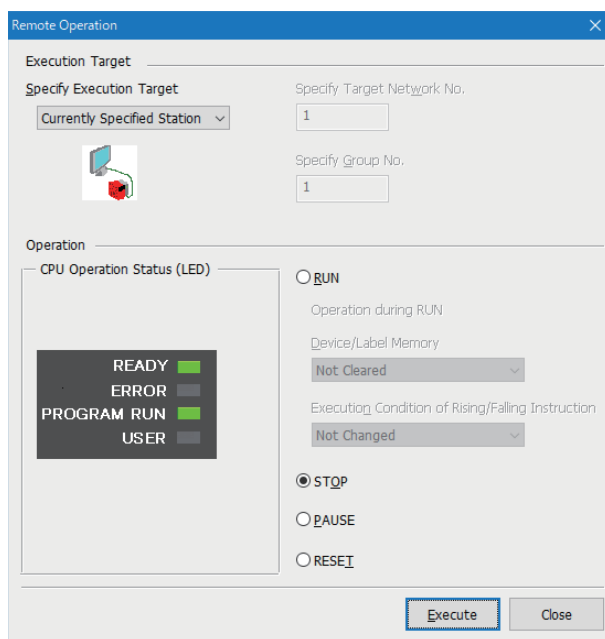
For details, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

In this section, the "Remote Operation" screen is used.

Window

Select [Online] ⇒ [Remote Operation].



The screen above is an example when connecting with an RnCPU.

Operating procedure

Set the following items and click the [Execute] button.

| Execution target | Description |
|---|--|
| Currently Specified Station ^{*1} | <p>■ CPU module Select this to perform the remote operation only on the station specified in the connection destination setting.</p> <p>■ Remote head module in a redundant system configuration</p> <ul style="list-style-type: none"> When starting from [Online] ⇒ [Remote Operation]: the remote operation is performed on the system of the remote head module specified as the connection destination. When starting from the "CC IE Field Diagnostics" screen: the remote operation is performed on the system of the remote head module specified as the diagnostics target. |
| All Stations Specified ^{*2} | Select this to perform the remote operation on the station specified in the connection destination setting and all the stations on the same network. Set a target network in "Specify Target Network No.". |
| Specify Group No. ^{*2} | <p>Select this to perform the remote operation on the station specified in the connection destination setting and each station of the specific group on the specified network.</p> <p>Set a target network in "Specify Target Network No.", and set a group number in "Specify Group No.".</p> <p>The remote operation cannot be performed for CC-Link IE Field Network because it does not have group number.</p> |
| Specify Both Systems ^{*2} | Select this to perform the remote operation on the both systems (control/standby) on the route specified on the "Specify Connection Destination" screen. This setting is applied for a CPU module in a redundant system configuration. |

^{*1} When resetting a CPU module in a redundant system configuration and a remote head module, "Currently Specified Station/Specify Both Systems" is displayed.

^{*2} FX5CPUs and remote head modules do not support it.

Remote operation and RUN/STOP switch

When the operation to the CPU module differs by the remote operation, RUN/STOP switch, or remote RUN/PAUSE contact, the CPU module operates according to the priority shown below:

| Operation to CPU module | Priority |
|-------------------------|----------|
| STOP | 1 |
| PAUSE | 2 |
| RUN | 3 |

The operating status after RUN/STOP switching on the CPU module or remote RUN/STOP contact operation are as follows.

| Remote operation | CPU module switch | | Remote RUN/STOP contact is ON (The CPU module is in STOP.) |
|---------------------|--------------------------|-------|---|
| | RUN | STOP | |
| RUN | RUN | STOP | STOP |
| STOP | STOP | STOP | STOP |
| PAUSE ^{*1} | PAUSE | STOP | STOP |
| RESET ^{*2} | Inoperable ^{*3} | RESET | RESET |

*1 Remote head modules do not support it.

*2 Remote reset is required to be enabled in "Operation Related Setting" of "CPU Parameter."

*3 Operable when the CPU module is switched to STOP by remote operation.

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.

An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|---|
| Backup mode | <p>■STOP Applied to both systems (order: control system → standby system).</p> <p>■RUN, PAUSE Applied to both systems (order: control system → standby system).</p> <p>■RESET Control system (specified): applied to both systems (order: control system → standby system). Standby system (specified): applied to the standby system only.</p> |
| Separate mode | Applied to the CPU module in the connective system. |

18.3 Redundant Programmable Controller Operations

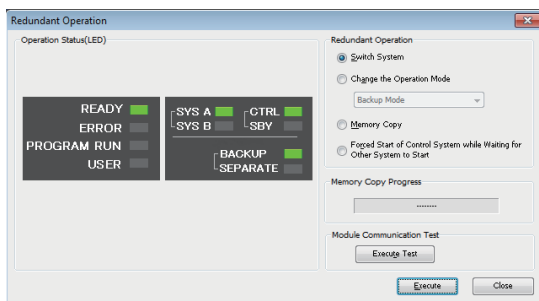
This section explains the method for operating redundant functions of both a CPU module and a remote head module in a redundant system configuration.

○: Supported, —: Not supported

| Function name | RnPCPU (redundant mode) | RnPSFCPU | Remote head module |
|--|-------------------------|----------|--------------------|
| System switching | ○ | ○ | ○ |
| Operation mode change | ○ | — | — |
| Memory copy | ○ | ○ | — |
| Control system forced start while waiting for the other system started | ○ | ○ | — |
| Redundant function module communication test | ○ | ○ | — |
| System A/B setting | ○ | ○ | — |

Window

Select [Online] ⇒ [Redundant PLC Operation] ⇒ [Redundant Operation].



System switching

The system of the current connection destination can be switched (control system → standby system).

This is allowed when the current connection destination is the control system, and the manual change permission flag (SM1646) is turned ON.

For details on the operation, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)

Operating procedure

Select "Switch System" in the "Redundant Operation" screen, and click the [Execute] button.

Operation mode change

The operation mode of the current connection destination can be changed (backup mode or separate mode.)

This is allowed when the current connection destination is the control system.

For details on the operation, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)


Operating procedure

1. Select "Change the Operation Mode" in the "Redundant Operation" screen.
2. Select a new operation mode ("Backup Mode" or "Separate Mode"), and click the [Execute] button.

Memory copy from the control system to the standby system

To make the memory contents of the CPU modules in the control system and standby system consistent, the parameters and program etc. of the CPU module in the control system are transferred to the CPU module in the standby system.

For details on the operation, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

Operating procedure

Select "Memory Copy" in the "Redundant Operation" screen, and click the [Execute] button.


Precautions

For the control system, the following operations and functions cannot be performed during memory copy; initialization of CPU memory operation, data writing to a programmable controller (including an operation while a CPU module is in RUN), memory copy, online program change, system switching, and operation mode change.

Control system forced start while waiting for the other system started

The CPU module, which is waiting the other system to start, can start as the control system.

For details on the operation, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

Operating procedure


Select "Forced Start of Control System while Waiting for Other System to Start" in the "Redundant Operation" screen, and click the [Execute] button.

Redundant function module communication test

A communication test can be performed only for a redundant function module (R6RFM) on a standby system.

This function is available only when a CPU module on a standby system is directly connected to a personal computer.

For details on the operation, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

Operating procedure

Click the [Execute Test] button in the "Redundant Operation" screen.

System A/B setting

Either the system A or system B can be set for the connected CPU module.

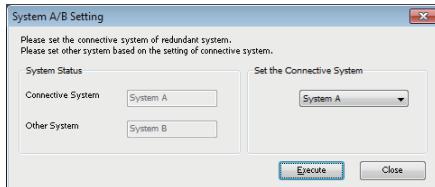
For details on the operation, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

18

Window

Select [Online] ⇒ [Redundant PLC Operation] ⇒ [System A/B Setting].



Operating procedure

Select the system, which is set for the connective system, in "Set the Host System," then click the [Execute] button.

18.4 Safety Programmable Controller Operations

This section explains the method to perform the functions of an RnPSFCPU and an RnSFCPU.

Safety operation mode switching

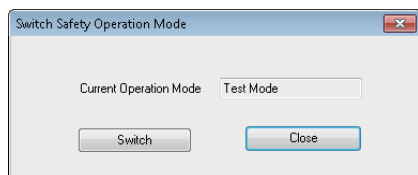
The safety operation modes (safety mode or test mode) of a CPU module can be switched.

For details on the operation, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

Window

Select [Online] ⇒ [Safety PLC Operation] ⇒ [Switch Safety Operation Mode].



Point

The safety operation mode of a running CPU module can be checked in the [Module Information List] tab on the "Module Diagnostics" screen.

Precautions

■Unmatched data

The safety operation mode cannot be switched to the safety mode if project data in GX Works3 and that in an RnSFCPU or RnPSFCPU do not match. Whether data matches is checked by using their file identifiers; data is considered as a match if the file identifiers match.

If data does not match, perform either of the following operations. The safety operation mode becomes switchable to the safety mode.

- Writing data in GX Works3 to the CPU module
- Reading data from the CPU module

Considerations before switching the safety operation mode

CAUTION

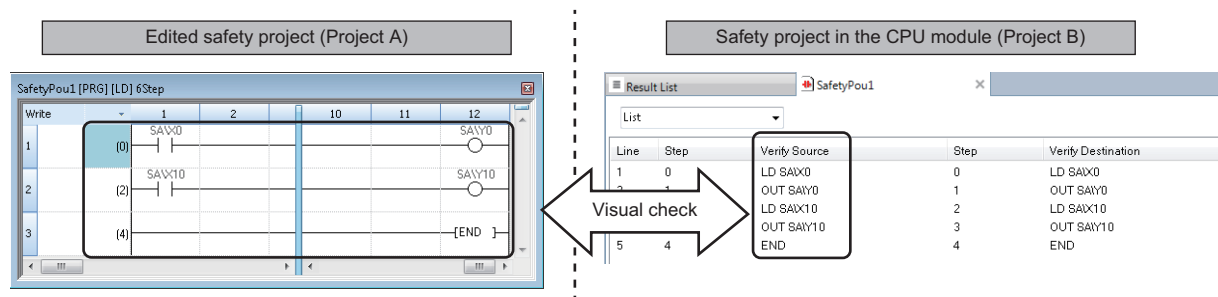
- Test the programs fully on the system level for all safety loops before switching the mode to the safety mode.
- Before switching to the safety mode, ensure that the programs and parameters of the intended safety project have been written properly by the following operation.

Operating procedure

1. Save an edited safety project in the personal computer. (Hereinafter called 'Project A')
2. Start GX Works3, and write the programs and parameters of a safety project to CPU module. (Page 600 Writing data to a programmable controller)
3. Start another GX Works3, and read the programs and the parameters from a CPU module. (Page 609 Reading data from a programmable controller) (Hereinafter called 'Project B')
4. Visually check that there is no difference between Project A and Project B. (Page 795 Checking programs, Page 795 Checking module parameters (Safety Communication Setting), Page 796 Checking parameters of safety remote I/O modules)
5. Test the programs fully in the application environment.

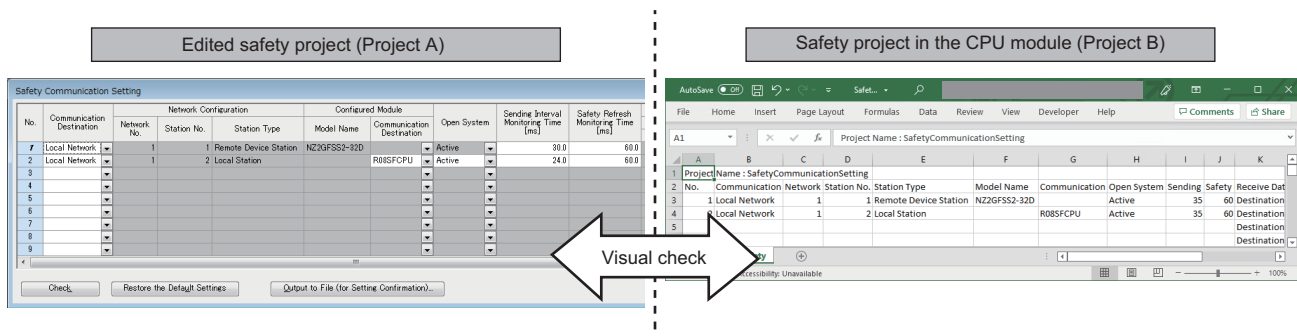
Checking programs

To check whether intended programs were written properly, select "Project A" as the verification destination in Project B. Then, compare the verification source data the details of which are displayed in the "Verify Result" window with the project A data in a program editor.



Checking module parameters (Safety Communication Setting)

To check whether intended parameters were written properly, output the module parameters in "Safety Communication Setting" of "Module Parameter" to a file. Then, compare the saved CSV file with the project A data in the "Safety Communication Setting" window.

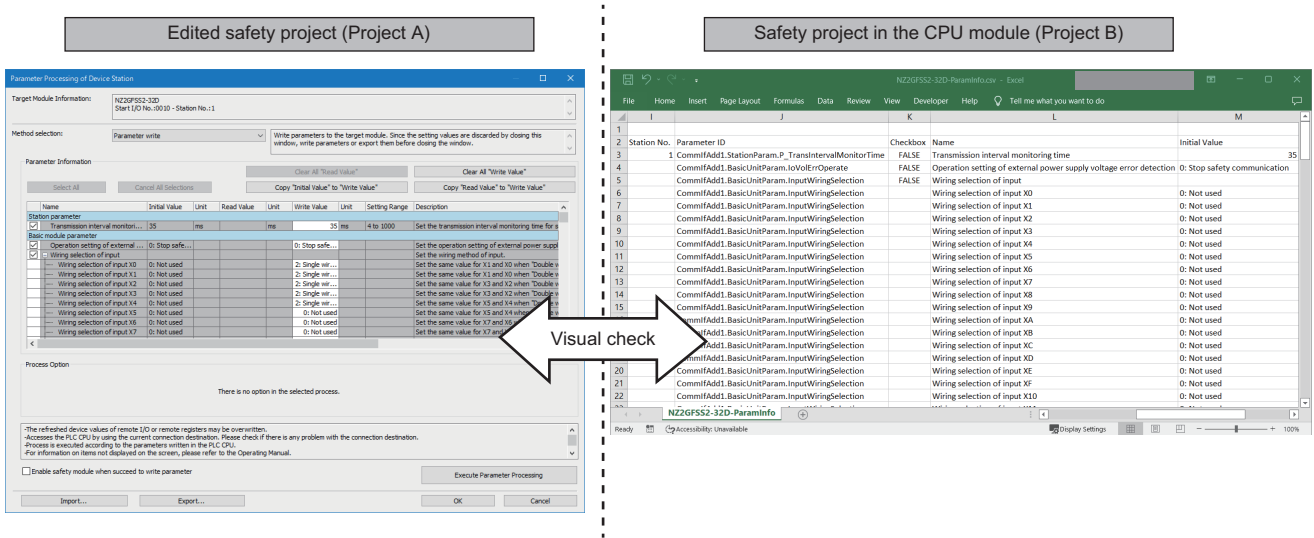


The figure above is a screen example in which Excel is used. CSV files can also be checked by using other text editors.

■Checking parameters of safety remote I/O modules

Check the following for all of the safety remote I/O modules (device stations on CC-Link IE TSN and CC-Link IE Field Network) in Project B.

Read the parameters from the safety remote I/O modules in Project B. Export the read parameters to a file. Compare the saved CSV file with the data in the "Parameter Processing of Device Station" screen of Project A. Whether the intended parameters was written properly can be checked.



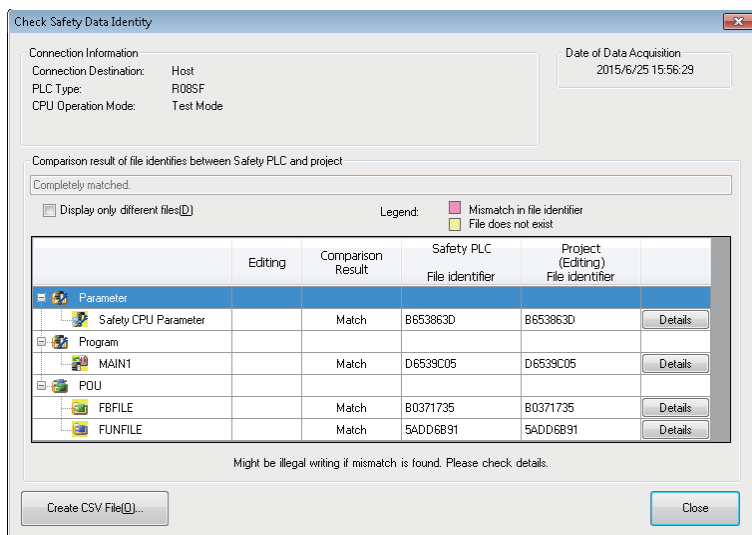
Identification check for safety data

In the "Check Safety Data Identity" screen, project data in GX Works3 can be checked if it is the same as that in an RnSFCPU or an RnPSFCPU. By this function, a user can check if a program operated in the safety mode is the data written by the user. For considerations when using this function, refer to the following:

📖 MELSEC iQ-R Safety Application Guide

Window

Select [Online] ⇒ [Safety PLC Operation] ⇒ [Check Safety Data Identity].



Checking whether the data in the project and in the CPU module are consistent

Check the result of compared data.

Checking whether the CPU module is running with the intended data

1. Save the information of Check Safety Data Identity in the CPU module as a CSV file using GX Works3 when the mode is changed to the safety mode after writing programs/parameters to the CPU module.
2. At a later date, perform the Check Safety Data Identity function with GX Works3, and check whether the "File identifier" in the saved CSV file and the one in the result are consistent.

If the data is not consistent, the data in the CPU module may not be the one written by the user. In this case, do not use the data in the actual operation.



The file identifier is added at conversion.

Safety backup/restoration function

This function restores the backup data to a CPU module automatically.

Automatic restoration setting

Operating procedure

Select [Online] ⇒ [Safety PLC Operation] ⇒ [Automatic Restore Setting] ⇒ [Enable]/[Disable].

Safety module operation

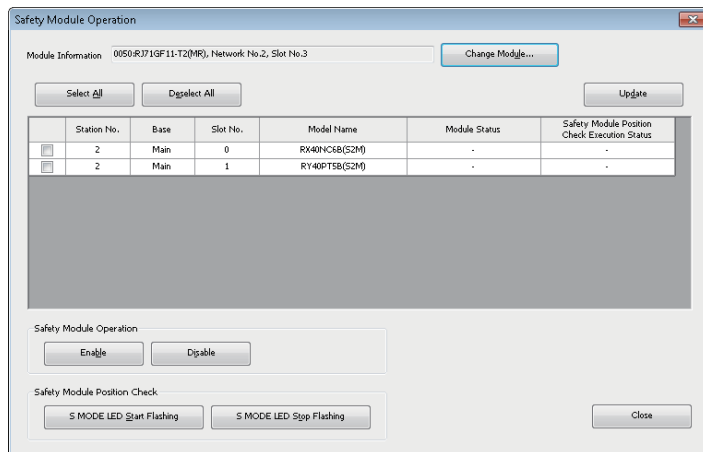
The safety communication function can be enabled or disabled for a module used in a system using an RnSFCPU or RnPSFCPU.

Window

1. Select [Online] ⇒ [Safety PLC Operation] ⇒ [Safety Module Operation].
2. Select a module to operate in the "Safety Module Operation - Select Module" screen, and click the [OK] button. (For an RnPSFCPU only)

Ex.

System using an RnPSFCPU



Checking the position of a module

Check the mounting position of a module before enabling or disabling.

Operating procedure

1. Select a module to check the position.
2. Click the [S MODE LED Start Flashing] button.

After checking that the S MODE LED of the selected module is flashing, click the [S MODE LED Stop Flashing] button.

Enabling or disabling the safety communication function

The safety communication function can be switched to enable or disable for a module used in a system using an RnSFCPU or RnPSFCPU.

RnSFCPU's do not support disabling the safety communication function.

Operating procedure

1. Select a module to enable or disable the safety communication function.
2. Click the [Enable] or [Disable] button.
3. Reset the remote head module, or turn the power OFF and ON.

18.5 Checking Memory Usage

This section explains the method for checking the usage of the following memories:

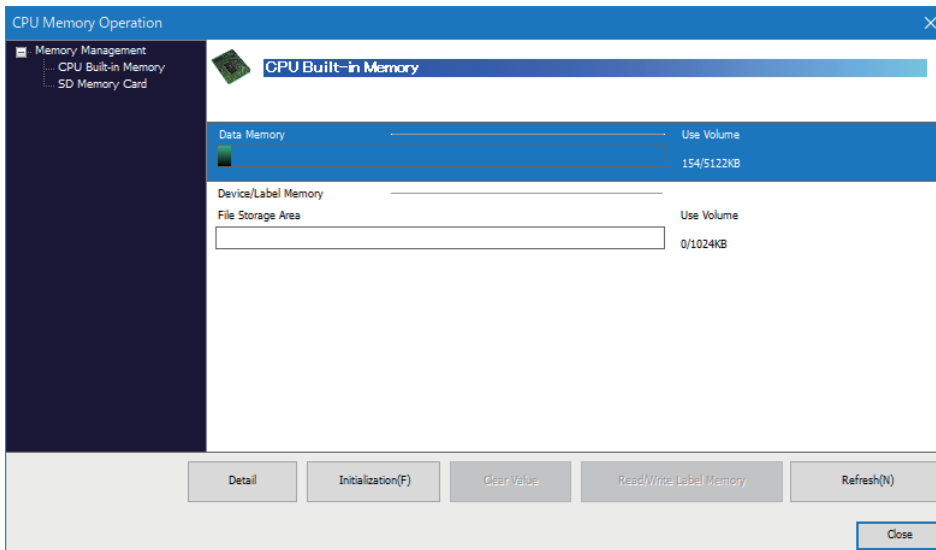
- Data memory built in a CPU module
- Device/label memory built in a CPU module
- SD memory card inserted in a CPU module

CPU memory operation screen

Each memory usage can be checked in the "CPU Memory Operation" screen.

Window

Select [Online] ⇒ [CPU Memory Operation].

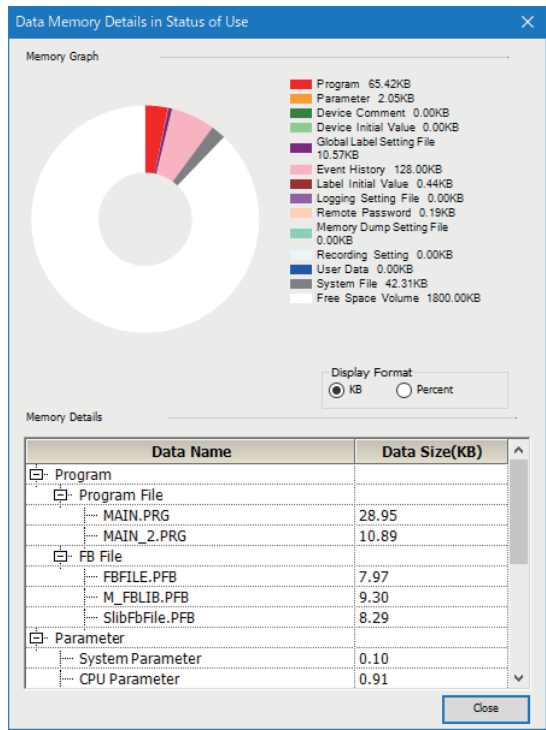


Detailed memory usage screen

Details on each memory usage can be checked in the "Data Memory Details in Status of Use" screen.

Window

Click the [Detail] button in the "CPU Memory Operation" screen.



18.6 Initializing/Clearing a Memory

This section explains the methods for operating memories (such as initialization and zero clear) in a CPU module.

For content initialized by the memory operations, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

Initializing data

Delete files in the data memory/device memory/label memory of the CPU module, or folders/files stored in the SD memory card.

Note that the information for the user authentication will not be deleted. To delete the information, initialize all information.

(👉 Page 715 When a user name and a password used in the user authentication function are lost)

After initializing, rewrite the programmable controller data to the CPU module.

If the power of the CPU is turned OFF and ON or the CPU module was reset, the allocation for the device/label memory is back to the initial status. (Each area has the default capacity.)

Operating procedure

1. Select [Online] ⇒ [CPU Memory Operation]. (👉 Page 799 Checking Memory Usage)
2. Select "Data Memory" or "File Storage Area" in the "CPU Memory Operation" screen, and click the [Initialization] button. When initializing an SD memory card, select "SD Memory Card" displayed on the left of the screen.

Precautions

Initialize an SD memory card to be inserted in a CPU module by using this function.

If an SD memory card is initialized by the function such as the Windows format function, it may be unavailable in a CPU module.

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.


An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|---|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). |

Clearing values

Clear the values of devices, labels, and file registers to '0', and perform latch clear operation.

Operating procedure

1. Select [Online] ⇒ [CPU Memory Operation]. ( Page 799 Checking Memory Usage)
2. Select "Device/Label Memory" in the "CPU Memory Operation" screen, and click the [Clear Value] button.
3. Set each item in the "Clear Value" screen and click the [Execute] button.

Point

When the initial device value file or initial label value file is written to a CPU module, the initial values are initialized by resetting the CPU module.

■Operations when using CPU modules in a redundant system configuration

For an RnPCPU (redundant mode), the operations differ depending on the operation modes.

An RnPSFCPU operates only when selecting the backup mode for the operation mode.

| Operation mode | Operation |
|----------------|---|
| Separate mode | Applied to the CPU module in the connective system. |
| Backup mode | Applied to both systems (order: control system → standby system). |

18.7 Reading/Writing the Label Memory

This section explains the methods for reading the label memory (current label values) from a CPU module and for writing the read label memory to the CPU module.

FX5CPUs do not support this function.

Conditions

The label memory can be read/written only when all the following conditions are satisfied:

| Operation | Condition |
|--------------------------|--|
| Reading the label memory | A label of which the label memory can be read exists in a project. (☞ Page 804 Availability of reading the label memory) |
| | All programs in a project are converted. |
| | System parameters and CPU parameters match between the following data: <ul style="list-style-type: none"> • Project data opened in GX Works3 • Data in a CPU module For an RnSF CPU and an RnPSF CPU, the safety CPU parameters must match between the above data. |
| | A project or CPU module is logged on to as a user with any of the following access levels. (For an RnSF CPU and an RnPSF CPU only) <ul style="list-style-type: none"> • Administrators • Developers • Assistant Developers |
| Writing the label memory | All programs in a project are converted. |
| | A CPU module is in the STOP state. |
| | The module type and operation mode of a CPU module match between when reading and writing the label memory. |
| | A CPU module is in the test mode. (For an RnSF CPU and an RnPSF CPU only) |
| | System parameters and CPU parameters match between the following data: <ul style="list-style-type: none"> • Data when reading the label memory • Data in a CPU module For an RnSF CPU and an RnPSF CPU, the safety CPU parameters must match between the above data. |
| | A project or CPU module is logged on to as a user with any of the following access levels. (For an RnSF CPU and an RnPSF CPU only) <ul style="list-style-type: none"> • Administrators • Developers • Assistant Developers |

Reading the label memory

The following shows the procedure for reading the label memory from a CPU module.

Before reading the label memory, check if any function such as the change current value function is being performed to a CPU module.

If the current value is changed while reading, the value after the change is read.

Operating procedure

1. Select [Online] ⇒ [CPU Memory Operation].
2. Select "Device/Label Memory" in "CPU Built-in Memory" of the "CPU Memory Operation" screen.
3. Click the [Read/Write Label Memory] button.
4. Specify the storage destination for the label memory in "File Storage Destination" of the "Read/Write Label Memory" screen.
5. Select "Read from Label Memory" and click the [Execute] button.

The "BackupData" folder is generated in the storage destination specified in step 4, and the label memory is stored as a file in the folder.

Precautions

- Do not reset a CPU module or turn the power of the CPU module OFF while reading the label memory. Doing so cancels reading the label memory. (Page 804 When reading the label memory is canceled)
- If the "BackupData" folder is already in the storage destination for the label memory, the folder and all the data in the folder are deleted, and a new "BackupData" folder and each unit of data are generated.
- When reading the label memory from an RnPCPU (redundant mode), the memory is read from the connected system.

■Availability of reading the label memory

The following table shows whether the label memory can be read for each label class.

○: Readable, ×: Not readable

| Label | Class | Availability |
|--------------|---------------------|--------------|
| Global label | VAR_GLOBAL | ○ |
| | VAR_GLOBAL_CONSTANT | × |
| | VAR_GLOBAL_RETAIN | ○ |
| Local label | VAR_INPUT | ○ |
| | VAR_OUTPUT | ○ |
| | VAR_OUTPUT_RETAIN | ○ |
| | VAR | ○ |
| | VAR_CONSTANT | × |
| | VAR_RETAIN | ○ |
| | VAR_IN_OUT | ○ |
| | VAR_PUBLIC | ○ |
| | VAR_PUBLIC_RETAIN | ○ |

The label memory cannot be read for the following labels:

- Pointer type label
- Label to which a device is assigned
- Alias
- Function
- FB instance of a macro type function block
- FB instance of a standard function block
- FB instance of a module FB
- Program set as "No Execution Type"
- Local label in an unregistered program

■When reading the label memory is canceled

Reading the label memory is canceled in the following cases:

- A CPU module is reset while reading.
- The power of a CPU module is turned OFF while reading.
- Reading is canceled.
- The label memory cannot be read. (For example, free space on the read destination is insufficient or the access right to the read destination is not granted.)

When reading the label memory is canceled, the "BackupData" folder and all the files in the folder are deleted.

Writing the label memory

The following shows the procedure for writing the label memory to a CPU module.

Operating procedure

1. Select [Online] ⇒ [CPU Memory Operation].
2. Select "Device/Label Memory" in "CPU Built-in Memory" of the "CPU Memory Operation" screen.
3. Click the [Read/Write Label Memory] button.
4. Specify the folder in which "BackupData" folder was generated when reading the label memory in "File Storage Destination" of the "Read/Write Label Memory" screen.
5. Select "Write to Label Memory" and click the [Execute] button.

Point

By selecting "Save" for the following CPU parameter, the operation of writing the label memory is displayed as an event of 'Write Device...(n points)' or 'Write Label...(n points)' in the "Event History" screen.

- "CPU Parameter" ⇒ "RAS Setting" ⇒ "Event History Setting" ⇒ "Save Device/Label Operations"

Precautions

- Do not turn the power of a CPU module OFF or reset the CPU module while writing the label memory. Doing so cancels writing the label memory.
- Do not edit a file in the "BackupData" folder. Doing so may prevent the label memory from being written properly.
- Characters in a label name are case-sensitive.
- The label memory of a label to which a device is assigned is not written.
- If any of the following items of a label is edited from when reading the label memory until when writing it again, the label memory of the label is not written.
 - Label name
 - Data type
 - Number of dimensions of the array

In addition, if a program name is edited, the label memory of local labels used in the program is not written.

- If the number of array elements is changed from when reading the label memory until when writing it again, it is required to write data to a programmable controller before writing the label memory to a programmable controller.

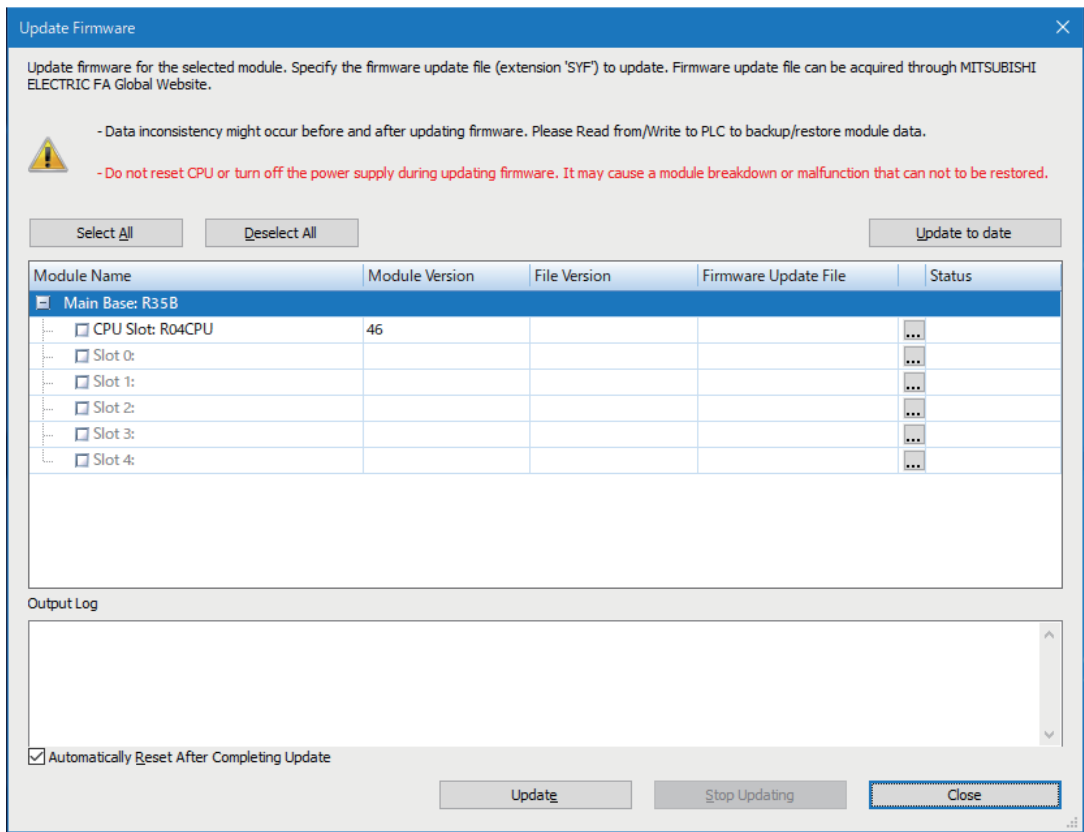
In addition, when writing the label memory, the label memory is written only for the number of elements before the change.
- If writing the label memory while monitoring a program, monitoring pauses and it starts again after writing the label memory is completed.
- When monitoring a program in an engineering tool other than GX Works3, the monitor value may be changed when writing the label memory is completed.
- When writing the label memory to an RnPCPU (redundant mode), the memory is written to the connected system.

18.8 Firmware Update

The firmware of a module can be updated using GX Works3.
This section explains the method to display the "Update Firmware" screen.
For the method to update a firmware and the considerations, refer to the following:
📖MELSEC iQ-R Module Configuration Manual
📖MELSEC iQ-F FX5 User's Manual (Application)

Window

Select [Tool] ⇒ [Update Firmware].



APPENDIX

Appendix 1 Additions and Changes from Previous Version

This section shows the additions and changes with upgrade.

For additions and changes in a process control function block with a version upgrade, refer to 'Version Upgrade' in the following manual:

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

Functions, operability, and performance

Version 1.001B

| Item | Description | Reference |
|---------------|---|--|
| Online change | <ul style="list-style-type: none">• Online change on an instruction basis in ladder programs is supported.• Online change for ST programs is supported.• Online change after changing or deleting initial label values is supported. | Page 617 Writing Programs While a CPU Module is in the RUN State |
| Monitoring | <ul style="list-style-type: none">• When using a constant label for an input argument of a function block, a constant value is displayed in monitoring.• When display language in GX Works3 is changed, the language in an intelligent function module monitor window is also changed. | Page 636 Checking Execution Programs on a Program Editor |

Version 1.005F

| Item | Description | Reference |
|---|--|---|
| Display language switching | <ul style="list-style-type: none">• Display in Simplified Chinese is supported. | Page 49 Display Language Switching |
| Printing | <ul style="list-style-type: none">• Printing the product information list is supported. | Page 93 Printing Data |
| Module tool list | <p>The following settings are available.</p> <ul style="list-style-type: none">• "Offset/gain setting" under "Temperature Input" for "iQ-R Series"• "Q61LD Two-Point Calibration Setting" under "Analog Module" for "Q Series"• "Q61LD Default Setting" under "Analog Module" for "Q Series" | Page 226 Other Settings of Intelligent Function Modules |
| Interaction with iQ Works ^{*1} | <ul style="list-style-type: none">• System labels are supported.• The parameter reflection function of MELSOFT Navigator and the parameter import function are supported. | Page 233 REGISTERING LABELS |
| Program check | <ul style="list-style-type: none">• The program check function is supported. | Page 428 Checking a Program |
| Diagnostics ^{*4} | <ul style="list-style-type: none">• The CC-Link IE Controller Network diagnostics (twisted pair cable) is supported. | Page 740 CC-Link IE Controller Network diagnostics |
| Memory dump ^{*3} | <ul style="list-style-type: none">• The memory dump function is supported. | Page 752 Memory Dump Function |

A

Version 1.007H

| Item | Description | Reference |
|---------------------------------------|---|---|
| Module tool list | <ul style="list-style-type: none"> "Analog input - Offset/gain setting" under "Analog Adapter" for "FX5 Series" is supported. "Analog output - Offset/gain setting" under "Analog Adapter" for "FX5 Series" is supported. | Page 226 Other Settings of Intelligent Function Modules |
| Simple motion module setting function | <ul style="list-style-type: none"> The advanced synchronous control setting can be set on one screen, and the monitor function is supported. | Page 227 Simple motion module setting function |
| System label | <ul style="list-style-type: none"> A system label change notification can be received automatically. | Page 267 Importing after checking the changes |
| Creating a program | <ul style="list-style-type: none"> Function Block Diagram/Ladder Diagram language is supported. *3 | Page 330 Creating an FBD/LD Program |
| Reading sample comments | <ul style="list-style-type: none"> Sample comments are supported for a project in which an RD77MS is used. | Page 420 Reading sample comments |
| Simulation | Simulations in the following projects are supported. <ul style="list-style-type: none"> Project for an RnCPU Project in which RD77MS is used (It can interact with the simulation function of a project for an RnCPU.) | Page 538 PROGRAM SIMULATION |
| Others | <ul style="list-style-type: none"> Connected devices on the CC-Link IE Field Network can automatically be detected. | — |

Version 1.008J

| Item | Description | Reference |
|---------------|--|--|
| Event history | <ul style="list-style-type: none"> In the event history of an R12CCPU-V, script position information is added to the detailed information of the error code (3044h: program fault). | Page 749 Error History/Operation History Check |










Version 1.010L

| Item | Description | Reference |
|------------------------------------|---|--|
| Options | The following option is added: <ul style="list-style-type: none"> "Convert" ⇒ "Online Program Change" ⇒ "Operational Setting" ⇒ "Write device comment" | Page 85 Option Settings for Each Function |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> Projects for universal model process CPUs are supported. | Page 110 Opening a GX Works2 format project |
| Verification | <ul style="list-style-type: none"> Labels can be verified. | Page 151 Verifying Projects |
| Project revision history | <ul style="list-style-type: none"> The project revision history function is supported. | Page 168 Project Revision History |
| Temporary ladder change | <ul style="list-style-type: none"> An operation of a ladder block can temporarily changed in a ladder program. | Page 304 Changing ladder blocks temporarily |
| Search | <ul style="list-style-type: none"> As one of the search functions, a function to search a global device and a local device individually is added. | Page 463 Searching for/ Replacing Devices and Labels |
| Library management | <ul style="list-style-type: none"> A user library is supported. | Page 527 Enhancing Use of User Library |
| Simulation | <ul style="list-style-type: none"> A project for an RnPCPU can be simulated. | Page 538 PROGRAM SIMULATION |
| Diagnostics | <ul style="list-style-type: none"> The MELSECNET diagnostics is supported for a project in which a MELSEC-Q series MELSECNET/H network module is used. | Page 745 MELSECNET diagnostics |

Version 1.015R

| Item | Description | Reference |
|--|--|--|
| Element selection window | <ul style="list-style-type: none"> Elements of RnCPUs and RnPCPUs are displayed in order by their capacity. | Page 58 Element selection window |
| Options | <p>The following option is added:</p> <ul style="list-style-type: none"> "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimize the Number of Steps" | Page 85 Option Settings for Each Function |
| Opening a GX Works2 format project | <p>The following items can be imported:</p> <ul style="list-style-type: none"> The boot file setting, SFC setting, and multiple CPU setting of PLC parameters A structured ladder program, FBD program, and device memory of an FXCPU (FX3U/FX3UC) The settings of CC-Link IE Field and CC-Link IE Control of network parameters The setting of a QD75 type positioning module in intelligent function modules. <p>For considerations when reading a GX Works2 format SFC program in GX Works3, refer to the technical bulletin FA-A-0192.</p> | Page 110 Opening a GX Works2 format project |
| Verification | <ul style="list-style-type: none"> Differences of a ladder diagram can be checked in the detailed display of a ladder program (ladder diagram format). | Page 153 Checking a verification result |
| Reading a module configuration | <ul style="list-style-type: none"> Module configuration can be read from the actual module in a project for an FX5CPU. | Page 199 Reading the module configuration from an actual system |
| Module tool list | <ul style="list-style-type: none"> Temperature control modules (R60TCTRT2TT2, R60TCTRT2TT2BW, R60TCRT4, R60RCRT4BW) are supported. | Page 226 Other Settings of Intelligent Function Modules |
| Creating an SFC program | <ul style="list-style-type: none"> Module labels of an RnCPU and sample comments are supported for an SFC program. | Page 258 Registering Module Labels Page 420 Reading sample comments |
| Execution order setting | <ul style="list-style-type: none"> The execution order of program blocks can be set. | Page 272 Program Execution Order and Execution Type Settings |
| Creating a program | <ul style="list-style-type: none"> Sequential Function Chart language is supported in projects for an RnCPU and an RnENCPU.^{*3} | Page 353 Creating an SFC Program |
| Memory size calculation | <ul style="list-style-type: none"> A memory size can be calculated offline. | Page 446 Calculating Memory Size |
| I/O system setting | <ul style="list-style-type: none"> Operations of an input/output device can be simulated by using this function. | Page 567 Simulation of External Device Operations |
| Writing data to an SD memory card Reading data from an SD memory card | <ul style="list-style-type: none"> Data can be written to/read from an SD memory card inserted into a personal computer. | Page 629 Writing/Reading Data to/from Memory Card |
| Diagnostics | <p>The following statuses are displayed in the CC-Link IE Field Network diagnostics.</p> <ul style="list-style-type: none"> Network connection status Parameter setting status Station type match status Network number match status Station number duplication occurrence status <p>In addition, the error frame reception status is displayed in three stages according to the frequency.</p> | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | <p>The following modules can be diagnosed:</p> <ul style="list-style-type: none"> CC-Link IE Field Network safety remote I/O modules (NZ2GFSS2-32D, NZ2EXSS2-8TE) CC-Link IE Field Network remote I/O modules (NZ2GF2B1N1-16D/T/TE, NZ2GFCF1-32D/T/DT) | |
| Offline monitor | <ul style="list-style-type: none"> Device data collected with the memory dump function can be monitored on a program editor. | Page 765 Checking Collected Data on Program Editor |
| Others | <ul style="list-style-type: none"> The high-speed remote net mode of CC-Link IE Field is supported. | — |
| | <ul style="list-style-type: none"> The receive buffer full detection signal is supported for a project in which an RJ71EN71 using Ethernet communication is used. | |
| Safety system | <ul style="list-style-type: none"> The safety communication function is available in an RnSFCPU project in which a CC-Link IE Field Network module is used. | |

Version 1.020W

| Item | Description | Reference |
|------------------------------------|--|---|
| Navigation window | <ul style="list-style-type: none"> Scan programs can be sorted by execution order. A parameter editor opens and displays "Program Setting" in "CPU Parameter" by selecting a program execution type in the navigation window and right-clicking [Program Setting] in the shortcut menu. | Page 53 Navigation window |
| Options | <p>The following option is added:</p> <ul style="list-style-type: none"> "Convert" ⇒ "Basic Setting" ⇒ "Conversion Operation" ⇒ "Enable Rebuild All (Reassignment)"/"Enable Rebuild All (Retain)"/"Enable Conversion" | Page 85 Option Settings for Each Function |
| Opening a project | <ul style="list-style-type: none"> When opening a project, the process to open the work windows that were opened in the previous project can be cancelled by pressing the  + [Pause Break] key. | Page 107 Opening a project |
| Opening a GX Works2 format project | <p>The following items can be imported:</p> <ul style="list-style-type: none"> Structured ladder program used for an FXCPU (FX3U/FX3UC) Setting for the CC-Link and Ethernet of network parameters Setting of an analog module and a high-speed counter module of intelligent function modules The boot file setting, SFC setting, and multiple CPU setting of PLC parameters | Page 110 Opening a GX Works2 format project |
| Verification | <ul style="list-style-type: none"> An FBD/LD program and an SFC program can be verified with ones in a CPU module. The verification result of an SFC program and a Zoom can be checked in the detailed display. | Page 158 Detailed display (program) Page 615 Verifying Programmable Controller Data |
| Ladder editor | <ul style="list-style-type: none"> When a contact is moved with a drag and drop operation while pressing the  key, lines are automatically drawn and the program of the original ladder block is completed. After selecting a range by pressing the  +     keys, when the mouse cursor is moved back to the original position, the selected range is deselected. | Page 281 Entering ladders |
| Temporary ladder change | <ul style="list-style-type: none"> Only a ladder block changed temporarily can be displayed in the "Line Statement List" screen. When changing the operation of a specific ladder block temporarily, an unused pointer device can be entered. When a character string is entered, it can be registered as a pointer type label. | Page 305 Displaying ladder blocks changed temporarily in a list |
| Creating a program | <ul style="list-style-type: none"> Sequential Function Chart language is supported in a project for an RnPCPU.³ | Page 353 Creating an SFC Program |
| FBD/LD editor | <ul style="list-style-type: none"> When registering a label by entering a label name in an editor, a suitable data type for the label in the location where the element is to be added is displayed in the "Undefined Label Registration" screen. A blank row between FBD network blocks and a blank column in the FBD network blocks can be deleted. Multiple undefined FBs/FUNs can be updated in a batch. Multiple rows can be inserted/deleted at the same time. An element can be edited by pressing the  key or  key on an editor. During monitoring, the background color of values of BOOL type labels and the power flow of a connection line can be set. | Page 336 Adding elements |
| Creating an SFC program | <p>The following are improved in an SFC program.</p> <ul style="list-style-type: none"> Multiple initial steps can be edited on an SFC editor. A jump can be edited on an SFC editor. A Zoom can be copied on an SFC editor. SFC Auto-scroll monitor can be used. Block information can be searched and replaced. | Page 361 Inserting initial steps Page 367 Inserting/editing jumps (connection lines) Page 650 Monitoring with the SFC auto-scroll |
| Import/export of device comments | <ul style="list-style-type: none"> Multiple device comments can be imported/exported in a batch. | Page 418 Exporting/importing device comments |
| Program check | <ul style="list-style-type: none"> The program check function is supported in a project for an FX5CPU. | Page 429 Program check |
| Library management | <ul style="list-style-type: none"> A user library is supported for a project used for an FX5CPU. | Page 528 Creating a library file |
| Library | <ul style="list-style-type: none"> A library POU to be exported can be selected individually. Multiple library POUs can be selected in the library list. A help file can be set and opened from the library list. | Page 528 Creating a library Page 531 Enhanced use of libraries |
| Simulation | <p>Simulations in the following projects are supported.</p> <ul style="list-style-type: none"> Project for multiple CPUs Project for an RnSFCPU Project for an RnENCPU <p>In addition, the following are supported by the simulation function.</p> <ul style="list-style-type: none"> SFC program execution in a project for an RnCPU Simulation of a project in which multiple RD77MSs are used (SMM Simulator2) I/O system setting (process response operation) | Page 544 System Simulation |

| Item | Description | Reference |
|-------------------------------------|---|--|
| Specifying a connection destination | <ul style="list-style-type: none"> Multiple connection destination settings can be created. | Page 577 Specification of Connection Destination |
| Online data operation | <ul style="list-style-type: none"> The selection status of data can be changed for each data in the [Write] tab of the "Online Data Operation" screen. | Page 597 Configuration of the online data operation screen |
| Diagnostics | <p>The following modules can be diagnosed:</p> <ul style="list-style-type: none"> CC-Link IE Field Network remote I/O modules (NZ2GFCF1-32D, NZ2GFCF1-32T, NZ2GFCF1-32DT) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| Monitoring | <ul style="list-style-type: none"> When an FB program is opened while monitoring a program, the FB instance starts monitoring. | Page 633 Starting/stopping monitoring |
| Installation of a USB driver | <ul style="list-style-type: none"> A USB driver is installed simultaneously with the installation of GX Works3. | Page 1048 USB Driver Installation Procedure |
| Others | <ul style="list-style-type: none"> The amplifier-less operation function of positioning modules (RD75D2, RD75D4, RD75P2, and RD75P4) is supported.*4 Sample comments and the intelligent function module monitor are supported for a project in which an MES interface module (RD81MES96) is used. Daylight saving time can be adjusted for the following modules. <ul style="list-style-type: none"> RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU (R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, R120ENCPU) | — |

Version 1.022Y

| Item | Description | Reference |
|--|---|--|
| Options | <p>The following option is added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "Ladder Editor" ⇒ "Verify" ⇒ "Verify Setting" ⇒ "Detailed Result Verification Selection" | Page 85 Option Settings for Each Function |
| Creating an FBD/LD program | <ul style="list-style-type: none"> A function to align an FBD network block on an FBD/LD editor to the left side is supported. | Page 346 Layout correction |
| Program check | <ul style="list-style-type: none"> The syntax check function is supported in a project for an RnCPU. | Page 428 Syntax check |
| Writing data to a programmable controller Online change | <ul style="list-style-type: none"> In projects for an RnCPU, an RnENCPU, and an RnSFCPU, whether to check the duplication of POU names can be selected.*3 | Page 600 Writing data to a programmable controller Page 622 POU duplication check |
| Online program change | <ul style="list-style-type: none"> The program restoration information can be written in the background process.*3 | Page 623 Program transfer during the online program change |
| Conversion | <ul style="list-style-type: none"> In a project for an RnCPU, the free space of the label memory area can be displayed in the "Output" window when the following processes are completed: converting any or all programs, or performing the online program change. | — |
| Others | <p>The following are supported for a project in which an RD77GF is used.</p> <ul style="list-style-type: none"> Linear servo motor control mode/direct drive motor control mode/fully closed loop control mode Synchronous encoder via a servo amplifier | — |


Version 1.025B

| Item | Description | Reference |
|--|---|--|
| Operating environment (operating system) | <ul style="list-style-type: none"> Windows 10 is supported. | — |
| Specifying a connection destination | <p>In a project used for an RCPUCPU and remote head module, connection via a following network interface board is supported.</p> <ul style="list-style-type: none"> CC-Link IE Controller Network interface board CC-Link IE Field Network interface board CC-Link Ver.2 board <p>The GOT transparent function performed via CC-Link IE Controller Network is supported.*4</p> | <p>Page 46 Connection through I/F boards</p> <p>Page 589 Accessing via GOT (GOT Transparent Function)</p> |
| Printing | <ul style="list-style-type: none"> This function is improved to print a selected page. | Page 93 Printing Data |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> A function to open a GX Works2 user library is supported in a project for an FX5CPU. | Page 110 Opening a GX Works2 format project |
| Project management Exporting libraries | <ul style="list-style-type: none"> An iQ AppPortal information file can be output. | Page 129 Saving a project |
| Changing the module type/ operation mode | <ul style="list-style-type: none"> The module type can be changed from an FX5CPU to an R04CPU. | Page 147 Changing the Module Type and Operation Mode of Projects |
| Verification | <ul style="list-style-type: none"> Module parameters of a CPU module can be verified. | Page 152 Parameters |
| XY assignment display | <ul style="list-style-type: none"> A function to display XY assignment information on the module configuration diagram and in the navigation window is supported. | Page 206 XY assignment display |
| Module tool list | <ul style="list-style-type: none"> A remote head module (RJ72GF15-T2) is supported (creation of wave output data). | Page 226 Other Settings of Intelligent Function Modules |
| Creating an ST program Creating an FBD/LD program | <p>The following are supported.</p> <ul style="list-style-type: none"> Registering devices/labels in the watch window automatically Displaying 'Warning' when type conversion is performed automatically Changing the display color of devices, labels and comments Creating multiple worksheets | <p>Page 136 Adding worksheets</p> <p>Page 320 Creating an ST Program</p> <p>Page 330 Creating an FBD/LD Program</p> |
| Execution order setting | <ul style="list-style-type: none"> The execution order of multiple worksheets can be set. | Page 273 Worksheet execution order setting |
| Creating a ladder program | <p>The following are supported.</p> <ul style="list-style-type: none"> Switching showing or hiding grids, and setting the grid color Displaying a comment in the continuous pasting function Returning to an edited ladder program to the state before the edition. Replacing a ladder program in the read mode Adjusting the size of an editor to the width of a window | Page 276 Creating a Ladder Program |
| FBD/LD editor SFC editor | <ul style="list-style-type: none"> An editor is zoomed in and out on the cursor position. | <p>Page 330 Creating an FBD/LD Program</p> <p>Page 353 Creating an SFC Program</p> |
| Device comment | <ul style="list-style-type: none"> Device comments can be exported to a file for each device type. | Page 418 Exporting |
| Program check | <ul style="list-style-type: none"> The syntax check function is supported in a project for an FX5CPU. | Page 428 Syntax check |
| Search/replacement | <ul style="list-style-type: none"> In a ladder editor, a range for search or replacement can be specified. | Page 461 Range specification in editors |
| Device batch replacement | <ul style="list-style-type: none"> When a character string is pasted onto the cell in the "Replace Device" row, the value set for "Points" will be remained. | Page 469 Batch Replacing of Devices and Labels |
| Cross reference | <ul style="list-style-type: none"> The current window can be specified as a search target. | Page 472 Displaying cross reference information |
| Cross reference Watch | <ul style="list-style-type: none"> A comment can be edited using a shortcut menu. | <p>Page 472 Displaying cross reference information</p> <p>Page 658 Checking Current Values by Registering Devices/Labels</p> |
| Unused label list | <ul style="list-style-type: none"> A function to display unused labels in the list format is supported. | Page 478 Displaying a list of unused labels |
| Library management | <ul style="list-style-type: none"> Libraries using a module label and/or structure can be exported. A sample library is supported in a project for an FX5CPU. | <p>Page 528 Creating a library file</p> <p>Page 533 Utilizing an element</p> |
| Simulation | <ul style="list-style-type: none"> A project for an FX5CPU can be simulated. | Page 538 PROGRAM SIMULATION |

| Item | Description | Reference |
|--|---|--|
| Writing data to a programmable controller Online change | <ul style="list-style-type: none"> In a project used for an RnPCPU (process mode/redundant mode), whether or not to check the duplication of POU names can be selected.*³ | Page 600 Writing data to a programmable controller Page 622 POU duplication check |
| Device/buffer memory batch monitor | <ul style="list-style-type: none"> Bit visibility is improved. | Page 654 Checking Device/Buffer Memory in a Batch |
| Watch | <ul style="list-style-type: none"> Visibility of bit devices and bit type labels are improved. | Page 658 Checking Current Values by Registering Devices/Labels |
| Diagnostics | The following modules can be diagnosed: <ul style="list-style-type: none"> CC-Link IE Field Network remote I/O modules (NZ2GF2B1N1-16D, NZ2GF2B1N1-16T, NZ2GF2B1N1-16TE) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| Project management | <ul style="list-style-type: none"> Labels, function blocks, and functions can be hidden in the navigation window. | — |
| Conversion | <ul style="list-style-type: none"> In a project for an FX5CPU, the free space of the label memory area is displayed on the "Output" window when the following processes are completed: converting any or all programs, or performing the online program change. | |
| Parameter | The following functions for RnCPUs and RnENCPU are available: <ul style="list-style-type: none"> File transfer function (FTP client) CPU module data backup/restoration function iQ Sensor Solution data backup/restoration function | |
| Module label | <ul style="list-style-type: none"> Module labels can easily be updated. | |
| Others | <ul style="list-style-type: none"> An RnPCPU (redundant mode) is supported. | |
| | <ul style="list-style-type: none"> The high-speed logging mode of an analog module (Q64ADH) is supported. | |
| | <ul style="list-style-type: none"> A redundant power supply system is supported in projects for an RnCPU, an RnENCPU, and an RnPCPU (process mode/redundant mode). | |
| | A redundant power supply system is supported for a project in which the following modules are used. <ul style="list-style-type: none"> CC-Link system master/local module (RJ61BT11) CC-Link IE Field Network modules (RJ71GF11-T2(MR), RJ71GF11-T2(SR), RJ71GF11-T2(LR)) CC-Link IE Controller Network-equipped module (RJ71GP21-SX(R)) Ethernet interface module (RJ71EN71) | |
| | <ul style="list-style-type: none"> The initial label value application setting function for RnPCPU is available. | |

Version 1.030G

| Item | Description | Reference |
|---|---|---|
| Navigation window | Even if labels, functions, and function blocks are hidden, the following data is displayed. <ul style="list-style-type: none"> A statement for which "Display in Navigation Window" is selected in the "Input Line Statement" window. Multiple worksheets | Page 53 Navigation window |
| Options | The following options are added: <ul style="list-style-type: none"> "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Enable the ladder editing by mouse operation" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Language Used by Instruction Conversion of String Operation" | Page 85 Option Settings for Each Function |
| Opening a GX Works2 format project | Parameters of the following modules can be imported in a project for an RnCPU. <ul style="list-style-type: none"> Serial communication module Temperature input module Temperature control module Simple motion module Input module Output module I/O module Interrupt module | Page 110 Opening a GX Works2 format project |
| Opening a GX IEC Developer format project | <ul style="list-style-type: none"> An ASCII format file exported in GX IEC Developer can be opened. | Page 118 Opening a GX IEC Developer format project |
| Verification | <ul style="list-style-type: none"> A device comment and device memory can be verified in project verification. CPU module parameters can be verified in a project for an FX5CPU. | Page 151 Verifying Projects |
| AnyWireASLINK configuration window | <ul style="list-style-type: none"> In a project for an RnCPU, an AnyWireASLINK system can be configured using this window. | Page 217 Setting network configuration and target devices |
| CC-Link IEF Basic configuration window | <ul style="list-style-type: none"> In projects for an RnCPU, an RnENCPU, and an FX5CPU, a CC-Link IE Field Network Basic system can be configured using this window. | |

| Item | Description | Reference |
|--|--|--|
| System parameter | <ul style="list-style-type: none"> When opening a system parameter, other screens, such as a parameter editor and module configuration diagram, are closed. | Page 211 Setting system parameters |
| Ladder editor | <ul style="list-style-type: none"> A statement can be set for an END instruction. | Page 276 Creating a Ladder Program |
| Importing/exporting ladder programs | <p>The following are supported.</p> <ul style="list-style-type: none"> Import/export of a CSV file Export to a HTML file | Page 308 Importing/exporting ladder programs |
| Creating an FBD/LD program | <p>The following are supported.</p> <ul style="list-style-type: none"> Displaying devices assigned to labels on an FBD/LD editor. Using devices assigned to global labels for label input. Wrapping a comment and a label name to display. Displaying the "Undefined Label Registration" screen for labels with member notation '.' and array notation '[']'. Searching or replacing a target by specifying a range | <p>Page 330 Configuration of an FBD/LD editor</p> <p>Page 336 Entering programs</p> <p>Page 330 Configuration of an FBD/LD editor</p> |
| Creating an SFC program | <p>The following are supported.</p> <ul style="list-style-type: none"> MELSAP-L (instruction format) display Displaying devices assigned to labels of an FBD/LD element Opening a new window in a block start step during monitoring with the SFC auto-scroll | <p>Page 358 Display format of action/transition</p> <p>Page 354 Configuration of an SFC diagram editor</p> <p>Page 650 Monitoring with the SFC auto-scroll</p> |
| Memory size calculation | <ul style="list-style-type: none"> "Byte" or "Step" can be selected from "Display Unit" in the "Confirm Memory Size (Offline)" screen. | Page 446 Calculating Memory Size |
| Cross reference | <ul style="list-style-type: none"> In an FBD/LD program, the data type of an FB/FUN using devices/labels as arguments can be displayed. MELSAP-L (instruction format) is supported. | Page 471 Displaying Device and Label Reference Information |
| Unused label list | <ul style="list-style-type: none"> A function to delete a label from the unused label list is supported. | Page 478 Displaying a list of unused labels |
| Simulation | <p>The following are supported.</p> <ul style="list-style-type: none"> Simulation of a project used for an RnPCPU (redundant mode) Simulation of a project in which an RnMTCPU is used (MT Simulator2) Simulation of a project in which an RD77GF is used (SMM Simulator2) The I/O system setting of a project for an FX5CPU Label initialization control function of RnPCPUs | Page 538 PROGRAM SIMULATION |
| Specifying a connection destination | <ul style="list-style-type: none"> The GOT transparent function via CC-Link IE Field Network is supported in a project for an RCPUs.*4 The GOT transparent function via CC-Link IE Controller Network is supported for a project used for an RnPCPU (redundant mode) and remote head module.*4 | Page 589 Accessing via GOT (GOT Transparent Function) |
| Writing data to a programmable controller | <ul style="list-style-type: none"> A project with no labels can individually be written to a CPU module. | Page 600 Writing data to a programmable controller |
| Writing data to an SD memory card Reading data from an SD memory card | <ul style="list-style-type: none"> Data can be written to or read from an SD memory card in a project for an FX5CPU. | Page 630 Writing to/Reading from a memory card |
| Monitoring | <ul style="list-style-type: none"> The visibility of a ladder editor with a low magnification is improved. | Page 631 CHECKING OPERATION OF PROGRAMS |
| Registering/canceling forced input/output*3 | <ul style="list-style-type: none"> When GX Works3 is connected to an RnCPU or an RnENCPU, input/output devices can forcibly be turned ON/OFF. | Page 666 Turning Input/Output Devices ON/OFF Forcibly |
| Intelligent function module monitor | <ul style="list-style-type: none"> The intelligent function module monitor function is supported in a project for an FX5CPU. | Page 680 Checking Current Values in an Intelligent Function Module |
| Diagnostics | <p>The following modules can be diagnosed:</p> <ul style="list-style-type: none"> Multiple input module (NZ2GF2S-60MD4) Analog input modules (NZ2GFCE-60ADI8, NZ2GFCE-60ADV8) Analog output modules (NZ2GFCE-60DAI8, NZ2GFCE-60DAV8) DC input modules (NZ2GF12A4-16D, NZ2GF12A4-16DE) Transistor output modules (NZ2GF12A2-16T, NZ2GF12A2-16TE) DC input transistor output combined module (NZ2GF12A42-16DT, NZ2GF12A42-16DTE) Servo amplifier (MR-J4-GF) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | <ul style="list-style-type: none"> The CC-Link IE Field Network Basic diagnostic is supported in projects for an RnCPU, an RnENCPU, and an FX5CPU. | Page 744 CC-Link IE Field Network Basic diagnostics |
| Offline monitor | <ul style="list-style-type: none"> Values of logging data displayed in GX LogViewer can be monitored on a program editor during offline monitoring. | Page 922 Checking logging data in version 1.063R or earlier |
| Others | <ul style="list-style-type: none"> When installing GX Works3, GX LogViewer and CPU Module Logging Configuration Tool can be installed at the same time. |  GX Works3 Installation Instructions |

| Item | Description | Reference |
|--------|---|--|
| FX5CPU | The following functions are available: ^{*3} <ul style="list-style-type: none"> • Event history • Data logging • File transfer function (FTP server) | Page 749 Error History/Operation History Check Page 756 Data Logging Function |
| | <ul style="list-style-type: none"> • A device connected with GX Works3 on Ethernet can automatically be detected. • Parameters for FX5CPU built-in functions can be verified. | — |
| | <ul style="list-style-type: none"> • Assignment of global labels are retained in a project for an FX5CPU. | |

■Parameters



| Category | Module type | Module | Parameter ^{*3*4} | Description |
|---------------|-------------|--------|--|---|
| CPU parameter | FX5CPU | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Capacity Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "<Detailed Setting>" | The "Device/Label Memory Area Detailed Setting" screen is added. Parameters can easily be set and displayed in this screen. |

Version 1.032J

| Item | Description | Reference |
|---|--|---|
| Process control function | <ul style="list-style-type: none"> • A process control system is supported for a project used for an RnPCPU (process mode/redundant mode). | Page 23 Process control system |
| Element selection window | Data selected in the [Library] tab in the element selection window can be added to a project using the following menu. <ul style="list-style-type: none"> • Right-click data and select [Add to Project] from the shortcut menu. | Page 58 Element selection window |
| Options | The following options are added: <ul style="list-style-type: none"> • "Convert" ⇨ "Basic Setting" ⇨ "Conversion Operation" ⇨ "Enable Rebuild All (Reassignment)"/"Enable Rebuild All (Retain)"/"Enable Conversion" • "Monitor" ⇨ "FBD/LD editor" ⇨ "Display Setting" ⇨ "Use Same Display Format for Contact as Device/Label Current Value" | Page 85 Option Settings for Each Function |
| Opening a PX Developer format project | <ul style="list-style-type: none"> • A PX Developer format project created in PX Developer can be opened. | Page 113 Opening a PX Developer format project |
| Verification | <ul style="list-style-type: none"> • FB files and FUN files can be verified. • A device comment, device memory, and file register written in a CPU module can be verified. • After verifying program files, the details of the result can be checked. • Consistent ladder blocks are not displayed in a verification result of a ladder program. | Page 151 Verifying Projects Page 615 Verifying Programmable Controller Data Page 153 Checking a verification result |
| System configuration | <ul style="list-style-type: none"> • An RnENCPU and a motion control CPU can be used together in a multiple CPU system. | Page 203 Multiple CPU configurations |
| Creating a ladder program | <ul style="list-style-type: none"> • The setting values of a timer and a counter used in a ladder can be changed in a batch. | Page 300 Changing TC setting values |
| Creating an FBD/LD program | <ul style="list-style-type: none"> • A link can be set between a comment element and an element. • FBD Network Blocks can be displayed in a list. | Page 349 Linking a comment Page 351 Displaying FBD network blocks in a list |
| Creating an SFC program | <ul style="list-style-type: none"> • A link can be set between a comment element and an element. | Page 380 Linking a comment |
| Online data operation | Data to display in the "Online Data Operation" screen can be selected by setting the following menu. <ul style="list-style-type: none"> • [Setting] ⇨ [Set Favorites] | Page 597 Configuration of the online data operation screen |
| Writing data to a programmable controller | <ul style="list-style-type: none"> • When a module label is not used in "Refresh Setting" of "Module Parameter," the checkbox of "Module Parameter" is not selected even when "Global Label" is selected in the "Online Data Operation" screen. | Page 600 Writing data to a programmable controller |
| Registering/canceling forced input/output | <ul style="list-style-type: none"> • The "Register/Cancel Forced Input/Output" screen can be displayed using the icon in the monitor status bar. | Page 634 Status monitoring |
| Monitoring | <ul style="list-style-type: none"> • When "MELSAP-L (Instruction Format)" is used as the display format of an SFC diagram editor, the monitor value where the cursor is placed is highlighted in monitoring. | Page 648 MELSAP-L (instruction format) |
| Diagnostics | <ul style="list-style-type: none"> • The sensor/device monitor function is supported. | Page 730 Sensor/Device Status Check |
| | The following modules can be diagnosed: <ul style="list-style-type: none"> • CC-Link IE Field Network remote I/O modules (NZ2GF2B1-32D, NZ2GF2B1-32DT, NZ2GF2B1-32DTE, NZ2GF2B1-32T, NZ2GF2B1-32TE) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |

| Item | Description | Reference |
|------------|---|--|
| Simulation | <ul style="list-style-type: none"> The latch function is available. | Page 1004 Supported CPU module functions |
| Others | <ul style="list-style-type: none"> When a constant or bit device (X, Y, M, L, SM, F, B, SB) is set for the second argument of the dedicated function 'G(P).OFFGAN,' a conversion error occurs. | — |

Version 1.035M

| Item | Description | Reference |
|---|--|--|
| Options | <p>The following options are added:</p> <ul style="list-style-type: none"> • "Project" ⇒ "Save" ⇒ "Operational Setting" ⇒ "Save project after conversion"/"Save project after Write to PLC"/"Save project after Online Program Change"/"Save project after changing TC Setting Value and writing to PLC" • "Find/Replace" ⇒ "Common Item" ⇒ "Operational Setting" ⇒ "Distinguish DX/DY device from X/Y device when X/Y device is specified" | Page 85 Option Settings for Each Function |
| Printing | <p>An FBD/LD program can be printed according to the setting in the following option.</p> <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Element (Ladder Symbol)" ⇒ "Display Format" ⇒ "Numbers of Wrapping Rows for Device/Label Name" | Page 93 Printing Data |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> • The parameters of a triac output module (QY22) can be imported. | Page 110 Opening a GX Works2 format project |
| Opening a GX IEC Developer format project | <ul style="list-style-type: none"> • An IL/MELSEC IL program created in GX IEC Developer can be opened. | Page 118 Opening a GX IEC Developer format project |
| Help file | <ul style="list-style-type: none"> • A help file can be linked to a function or function block. | Page 141 Associating data with a help file |
| Verification | <ul style="list-style-type: none"> • Module extended parameters of a simple motion module can be verified. • The module information of an intelligent function module can be verified. | Page 151 Verifying Projects Page 615 Verifying Programmable Controller Data |
| Module tool list | <ul style="list-style-type: none"> • Multiple input modules (FX5-8AD) are supported. • Temperature control modules (FX5-4LC) are supported. • Positioning modules (FX5-20PG-P) are supported. | Page 226 Other Settings of Intelligent Function Modules |
| Importing/exporting ladder programs | <ul style="list-style-type: none"> • Ladder programs can be exported to a text file. | Page 317 Exporting to a text file |
| Creating a ladder program | <ul style="list-style-type: none"> • Pasting to the input and output circuit parts of a function block and function is supported. • A device comment editor can be opened from a program editor with the menu or shortcut key. • The width of all the selected columns can be changed. • Lines remain after deleting an instruction in the insert mode. • When an element is pasted to the position where a line cannot be pasted, only the element is pasted. • After pressing the  key to edit a device name, the edit can be cancelled by pressing the . <p>The display magnification of all ladder editors can be set in a batch by setting the following menu.</p> <ul style="list-style-type: none"> • [View] ⇒ [Zoom] ⇒ [Set Zoom Factor] <p>The following menu is available when editing a ladder program of a function or function block:</p> <ul style="list-style-type: none"> • [Edit] ⇒ [Documentation] ⇒ [Statement/Note Batch Edit] | Page 414 Displaying a device comment editor from a program editor |
| Creating an ST Program | <ul style="list-style-type: none"> • Usable instructions in an ST program are added. • A device comment editor can be opened from a program editor with the menu or shortcut key. | Page 414 Displaying a device comment editor from a program editor |
| Creating an FBD/LD program | <ul style="list-style-type: none"> • Connecting elements automatically can be disabled. • A device comment editor can be opened from a program editor with the menu or shortcut key. • The display order of comment elements can be changed. | Page 339 Common operations of elements Page 414 Displaying a device comment editor from a program editor |
| Creating an SFC program | <ul style="list-style-type: none"> • A device comment editor can be opened from a program editor with the menu or shortcut key. • The display order of comment elements can be changed. | Page 414 Displaying a device comment editor from a program editor |
| Creating a function block and function | <ul style="list-style-type: none"> • "Use MC/MCR to Control EN" can be set for a subroutine type function block in projects for an RnCPU and an RnENCPU.*³ | Page 506 Creating new data |
| Online program change | <ul style="list-style-type: none"> • When only one program file that is set as "No Execution Type" exists in a project, the data can be written to a CPU module by using the "Online Program Change" function. <p>The following data can be written to a CPU module using this function:</p> <ul style="list-style-type: none"> • A single SFC block*³ • SFC inactive block • After writing a project to a running RnPCPU (process mode), program restoration information can be written in the background process.*³ | Page 617 Writing Programs While a CPU Module is in the RUN State Page 621 Online program change of SFC programs |

| Item | Description | Reference |
|---|--|---|
| Diagnostics | In the following diagnostics, the diagnostics screen can be displayed when another station was specified as the connection destination. <ul style="list-style-type: none"> CC-Link IE Controller Network diagnostics CC-Link IE Field Network diagnostics | Page 740 CC-Link IE Controller Network diagnostics Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics Page 744 CC-Link IE Field Network Basic diagnostics |
| | The following settings are available in the CC-Link IE Field Network Basic diagnostics. <ul style="list-style-type: none"> Group setting of a remote station (No.1 to 4) Setting of the number of connected stations (up to 64 stations) | |
| | The following modules can be diagnosed: <ul style="list-style-type: none"> CC-Link IE Field Network remote I/O modules (NZ2GF2B2-16A, NZ2GF2B2-16R, NZ2GF2B2-16S, NZ2GF2S2-16A, NZ2GF2S2-16R, NZ2GF2S2-16S) CC-Link IE Field Network Basic remote I/O modules (NZ2MFB1-32D, NZ2MFB1-32T, NZ2MFB1-32TE1, NZ2MFB1-32DT, NZ2MFB1-32DTE1, NZ2MFB2-16A, NZ2MFB2-16R) | |
| Tool interaction | The following tools can be started in GX Works3. <ul style="list-style-type: none"> CPU Module Logging Configuration Tool GX LogViewer | Page 756 Data Logging Function |
| Simulation | The following are supported by the simulation function. <ul style="list-style-type: none"> Project in which an RD77GF32 is used (SMM Simulator) I/O control function of RCPUs Project in which a MELSEC iQ-F series simple motion module is used (SMM Simulator2) | Page 994 Using the Simulation Function |
| | <ul style="list-style-type: none"> The capacity of signal flow memory (for FB), which is used for simulating a project for an RnPCPU (R08PCPU, R16PCPU, R32PCPU, or R120PCPU), is expanded. | |
| e-Manual Viewer interaction | <ul style="list-style-type: none"> Sample programs (ladder) on the manuals that can be browsed in e-Manual Viewer can be copied on ladder programs in GX Works3. | Page 1046 Using Sample Programs |
| Search/replacement | When "Move" is selected in the following option in the "Find and Replace" window, an undisplayed device comment is also moved when replacing the device. <ul style="list-style-type: none"> "Find/Replace Options" ⇒ "Replace" ⇒ "Device Comment" | — |
| | <ul style="list-style-type: none"> When registering devices/labels within a selected range to a watch window or the "Device Batch Replace" screen, overlapped devices/labels are not registered. | |
| Writing data to a programmable controller | <ul style="list-style-type: none"> Unused function blocks and functions can be written to a CPU module. | |
| CC IE Field configuration window | The parameters of a device station can be saved in a project by selecting the checkbox of the following item in the "Options" screen. <ul style="list-style-type: none"> Save the parameter set by "Parameter Processing of Device Station" to project. | |
| | <ul style="list-style-type: none"> Same parameters can be written to/read from device stations with the same model name by using the "The Parameter Processing of Same Device Station" screen. | |
| CC-Link IEF Basic configuration window | The following iQ Sensor Solution functions are available.*5 <ul style="list-style-type: none"> Automatic detection of connected devices Communication setting reflection of remote station Parameter processing of remote station | |
| Others | <ul style="list-style-type: none"> The safety communication setting can be configured before writing parameters of a safety remote I/O module to a CPU module. The CPU module built-in database can be accessed from an external device. | Page 797 Automatic restoration setting |
| | <ul style="list-style-type: none"> The automatic restoration setting is supported in a project for an RnSFCPU. | |
| FX5CPU | The following options are added: <ul style="list-style-type: none"> "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Collectively Allocate Temporary Area to Optimize the Number of Steps" | Page 85 Option Settings for Each Function |
| | <ul style="list-style-type: none"> A CPU module can be accessed via a CC-Link IE Field Network module using the GOT transparent function.*4 | Page 589 Accessing via GOT (GOT Transparent Function) |
| | The following functions are available in a project for an FX5CPU: <ul style="list-style-type: none"> Memory dump Change of TC setting value Offline monitor Parallel link IP filter File transfer function (FTP server) Verification of extension adapters Simulation of a simple motion module Interaction with the FX5CPU simulation function | — |
| | <ul style="list-style-type: none"> Devices used by the function of a CPU module are displayed in the "Device List" window. | |

■Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|---------------------------|-------------|--|--|--|
| Module parameter | RnCPU | Positioning modules (RD75D2, RD75D4, RD75P2, RD75P4) | "Basic setting" ⇔ "OPR basic parameter" ⇔ "OPR method" | "7: Limit switch combined method" can be selected. |
| Module extended parameter | RnENCPU | | "Axis n Positioning data" ⇔ "Offline Simulation" | Newly added |
| | RnPCPU | | "Axis n Positioning data" ⇔ "Auto Calc Command Speed" | Newly added |
| | RnSFCPU | | "Axis n Positioning data" ⇔ "Auto Calc Auxiliary Arc" | Newly added |


Version 1.036N

| Item | Description | Reference |
|---------------|---|--|
| Online change | When writing data to a CPU module with either of the following functions, the behavior of each falling instruction right after the writing process is the same. <ul style="list-style-type: none"> • Online program change • File batch online change | Page 617 Writing Programs While a CPU Module is in the RUN State |

Version 1.038Q

| Item | Description | Reference |
|---|--|---|
| Creating a ladder program Creating an ST Program Creating an FBD/LD program | Reserved area capacities of the following items can be set in the "Properties" screen of a function block. <ul style="list-style-type: none"> • Label reserved area • Latch label reserved area • Signal flow reserved area | Page 508 Setting reserved area capacities |

Version 1.040S

| Item | Description | Reference |
|------------------------------------|--|---|
| Process control function | <ul style="list-style-type: none"> A process control system is supported in a project for an RnPSFCPU. | Page 23 Process control system |
| Navigation window | <ul style="list-style-type: none"> The background color and font color can be changed. The tree can be filtered. A message will appear when moving data. Module parameters and module POU's (shortcut) can be hidden. A module tool can be opened. <ul style="list-style-type: none"> The default display of modules that only one "Module Parameter" was displayed is changed so as not to display "Module Parameter." The default display is changed so as not to display "Module POU (Shortcut)." | Page 53 Navigation window |
| Ladder editor | <ul style="list-style-type: none"> When a program including a specific instruction (INV, MEP, MEF, EGP, EGF) does not comply with the instruction specifications, a conversion error occurs. When a project is opened, a ladder program that was previously displayed is displayed. When the position of the mouse cursor is in a nested master control instruction at the start of monitoring ladder program, the ON/OFF status of the master control instruction and the nesting number is displayed in the window title of the ladder editor. A line statement name can be edited in the navigation window. The comment of a structure member is displayed in the "Input Comment" screen. <ul style="list-style-type: none"> A device assigned to a label can be entered as a label. <p>When the number of displayed contacts are changed with the following option and input and output circuits of an FB/FUN is not displayed, the circuit is displayed highlighted.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Display Connection of Ladder Diagram" | Page 53 Navigation window Page 107 Opening a project |
| Creating an FBD/LD program | <ul style="list-style-type: none"> The font color and the background color of comment elements can be changed in the "Color and Font" screen. The font color and the background color of comment elements can be changed individually. <ul style="list-style-type: none"> A page break can be displayed in an FBD/LD editor. <ul style="list-style-type: none"> When a jump label element of an FBD/LD is selected and the  key is pressed, a pointer type label is displayed in an edit box as an option. | Page 82 Checking and Changing Colors and Fonts Page 330 Configuration of an FBD/LD editor Page 330 Configuration of an FBD/LD editor Page 336 Adding elements |
| Creating an SFC program | <ul style="list-style-type: none"> The font color and the background color of comment elements can be changed in the "Color and Font" screen. The font color and the background color of comment elements can be changed individually. | Page 82 Checking and Changing Colors and Fonts Page 354 Configuration of an SFC diagram editor |
| Options | <p>The following option is added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Include Device Comment in Copying" | Page 85 Option Settings for Each Function |
| Printing | <ul style="list-style-type: none"> Ladder programs can be printed by specifying the range (number of lines). Ladder programs can be printed by setting a page break for each ladder block. The page setting can be set for FBD/LD programs. Project data can be printed by changing the color and the font to the default setting. The contents of unset parameter items are no longer printed. | Page 93 Printing Data |
| Q/L/FX series compatibility mode | <p>GX Works3 in the Q/L/FX series compatibility mode can be started in GX Works3. In GX Works3 in the Q/L/FX series compatibility mode, projects for a QCPU (Q mode), an LCPUCPU, and an FXCPU can be used.</p> <p>The following operations can mainly be performed.</p> <ul style="list-style-type: none"> Creating a new project Creating a new project with data read from a CPU module Opening a project Performing the system monitor function automatically Saving a project as a GX Works3 project or GX Works2 project | Page 105 Creating a project Page 106 Creating a new project by reading data read from a programmable controller Page 107 Opening a project Page 129 Saving projects under the specified name |
| Opening a GX Works2 format project | <p>The following items can be imported in a project for an FX5CPU.</p> <ul style="list-style-type: none"> Project used for an FXCPU (FX3G/FX3GC) CC-Link settings of network parameters <ul style="list-style-type: none"> The names of instructions used in ST programs are replaced automatically. | Page 110 Opening a GX Works2 format project Page 947 Instructions in which the names need to be replaced |

| Item | Description | Reference |
|--|---|---|
| Opening a PX Developer format project | <p>The following project parameters that are set in a PX Developer format project can be imported.</p> <ul style="list-style-type: none"> • Program execution setting • I/O control • Event notification <p>• The initial values of FB properties that are set in a PX Developer format project can be imported.</p> | <p>Page 113 Opening a PX Developer format project</p> <p>Page 958 Correction of a PX Developer format project</p> |
| Opening a GX IEC Developer format project | <ul style="list-style-type: none"> • Data in an ASCII format file or SUL format file exported in GX IEC Developer can be imported into an open GX Works3 project. • Even when a GX Works3 project is not open, the module type of a GX IEC Developer format project can be changed. • An SUL format file (user library) exported in GX IEC Developer can be opened. | <p>Page 118 Opening a GX IEC Developer format project</p> <p>Page 530 Creating a GX Works3 format library from a GX IEC Developer format library</p> |
| Module configuration diagram | <ul style="list-style-type: none"> • Module parameters of a module with multiple ports can be opened in the "Input the Configuration Detailed Information" window. | Page 201 Setting parameters on the module configuration diagram |
| Parameter | <p>For a module in which the system parameter is set as follows, "Do not Synchronize" is automatically set to the "Setting" column in the "Select the Synchronous Target Module" screen.</p> <ul style="list-style-type: none"> • "I/O Assignment Setting" ⇒ "Module Status Setting" column: Empty • "Inter-module Synchronization Setting" ⇒ "Use Inter-module Synchronization Function in System": Use | Page 211 Setting system parameters |
| iQ Sensor Solution function*5 | <p>In a project using AnyWireASLINK or CC-Link IE Field Network, the following functions are available.</p> <ul style="list-style-type: none"> • Data backup/restoration | Page 218 iQ Sensor Solution functions |
| Module tool list | <ul style="list-style-type: none"> • Analog input modules (FX5-4AD) are supported. • Analog output modules (FX5-4DA) are supported. | Page 226 Displaying the module tool list |
| Importing/exporting ladder programs | <p>A program including the elements below can be exported to a CSV file. Moreover, a program including the elements below can be imported from a CSV file.</p> <ul style="list-style-type: none"> • Label • Inline structured text box • Function block and function <p>• When exporting a text file, whether or not to output step numbers can be set.</p> <ul style="list-style-type: none"> • A Zoom created in Ladder Diagram language can be exported in a CSV, HTML, or text file. • Listed instructions in a CSV file can be imported into a Zoom created in Ladder Diagram language. • Ladder programs in functions or function blocks can be exported in a CSV, HTML, or text file. • Listed instructions in a CSV file can be imported into ladder programs in functions or function blocks. | Page 308 Importing/exporting ladder programs |
| Device comment editor | <ul style="list-style-type: none"> • A screen can be split vertically. • When an unused device comment is deleted, the comments of bit-specified word devices are also deleted. | Page 413 Configuration of a device comment editor |
| Memory size calculation | <p>By selecting the version of an RnCPU, an RnENCPU, or an RnPCPU in the "Confirm Memory Size (Offline)" screen, the memory capacity can be calculated according to the selected version.</p> <ul style="list-style-type: none"> • RnCPU and RnENCPU: '30 and earlier versions' or '31 and later versions' • RnPCPU: '12 and earlier versions' or '13 and later versions' | Page 446 Calculating Memory Size |
| Cross reference | <ul style="list-style-type: none"> • A device assigned to an alias source is displayed as a 'device' of the alias. | Page 472 Displaying cross reference information |
| Library management | <ul style="list-style-type: none"> • Elements of a library created in an ST program or an FBD/LD program can be updated in a batch. | Page 535 Updating library POU's |
| Simulation | <ul style="list-style-type: none"> • Multiple systems that perform cyclic transmission can be simulated. • A simulation environment file can be saved. • A simulation environment file can be opened. • The label communication function from an external device can be set. | Page 538 PROGRAM SIMULATION |
| Specifying a connection destination | <ul style="list-style-type: none"> • In a project for an RCPU, except for RnPSFCPU, the GOT transparent function is supported in the networks connecting a personal computer and a GOT or connecting a GOT and a connection station via Ethernet.*4 | Page 589 Accessing via GOT (GOT Transparent Function) |
| Writing data to a programmable controller Online program change | <ul style="list-style-type: none"> • It is improved so that the status of edited function block or POU using a function will not be changed to unconverted when editing the program body of the subroutine type function block or function. • Program files, FB files, and FUN files can be written without the program restoration information.*3 | <p>Page 508 Converting function blocks</p> <p>Page 526 Converting functions</p> <p>Page 600 Program restoration information</p> <p>Page 624 Program restoration information</p> |

| Item | Description | Reference |
|--|--|--|
| Online change | <ul style="list-style-type: none"> When "Online Program Change" is performed after converting a program, whether or not to write the program can be selected in the "Online Data Operation" screen. | Page 617 Writing Programs While a CPU Module is in the RUN State |
| | <ul style="list-style-type: none"> The file batch online change can be performed when editing a global label, function block, or function in projects for an RnCPU, an RnENCPU, and an RnPCPU.*³ | Page 625 File batch online change |
| Device/buffer memory batch monitor | <ul style="list-style-type: none"> Multiple word devices can be registered in a watch window in a batch. | Page 656 Changing current values |
| Watch | <ul style="list-style-type: none"> When data is changed by editing or converting a program, the change is not applied to a watch window automatically. It will be updated when clicking the [Update] button. | Page 659 Updating the display |
| | <ul style="list-style-type: none"> In a watch window, the display of the current values of bit devices can be changed from 'TRUE/FALSE' to 'ON/OFF.' | Page 659 Other operations |
| | <ul style="list-style-type: none"> The current values of bit devices can be changed by clicking the [ON]/[OFF]/[Switch ON/OFF] buttons on a watch window. | — |
| Monitoring | <ul style="list-style-type: none"> SQL statements that are buffered by the DB buffering function of a MES Interface module (RD81MES96) and stored procedure call information can be displayed in an intelligent function module monitor window. | Page 680 Checking Current Values in an Intelligent Function Module |
| User authentication | <p>The following functions are supported in a project for an RnPSFCPU.</p> <ul style="list-style-type: none"> Authentication destination setting in the online function Logging off from a CPU module Logging off all users from a CPU module Copying user information to the other system | Page 710 Preventing Illegal Access to a CPU Module (User Authentication) |
| Sensor/device monitor | <ul style="list-style-type: none"> This function is available in a project using AnyWireASLINK. | Page 730 Sensor/Device Status Check |
| Diagnostics | <p>The following modules can be diagnosed:</p> <ul style="list-style-type: none"> CC-Link IE Field Network remote I/O modules (NZ2GFCE3N-32D, NZ2GFCE3N-32T, NZ2GFCE3N-32DT) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | <p>The following can be displayed in the CC-Link IE Field Network Basic diagnostics.</p> <ul style="list-style-type: none"> Detailed error information of a remote station | — |
| Safety programmable controller operation | <ul style="list-style-type: none"> The safety module operation function is supported in a project for an RnPSFCPU. | Page 794 Safety Programmable Controller Operations |
| Windows 10 | <ul style="list-style-type: none"> When a GX Works3 screen is not displayed properly, it can be fixed with high DPI scaling by using a Windows 10 function. | Page 1050 Troubleshooting |
| | <ul style="list-style-type: none"> GX Developer can be installed with GX Works3. | — |
| Conversion | <ul style="list-style-type: none"> When changing the type of a function block, all the programs are converted (reassigned) in the next conversion. | |
| Search/replacement | <ul style="list-style-type: none"> Data is searched for or replaced in the display order in the navigation window. | |
| Search/replacement Cross reference | <ul style="list-style-type: none"> In an ST editor, FBD/LD editor, and SFC diagram editor, data can be searched for/replaced with the checkbox of "Multiple words" selected in "Find/Replace Options." | |
| Device list | <ul style="list-style-type: none"> When an instruction which uses multiple devices (example: BMOV (P)) exists in an ST, FBD/LD, or SFC program, all devices in the range used for the instruction are displayed in the device list. The number of times all devices for program indirection in programs have been used is displayed in the device list. | |
| Interaction with iQ Works ² | <p>The following operations can be performed in MELSOFT Navigator:</p> <ul style="list-style-type: none"> Applying label information in an electrical CAD file that is imported in MELSOFT Navigator to global labels in GX Works3. Setting global labels in GX Works3 for label information in MELSOFT Navigator and exporting the label information as an electrical CAD file. | |
| FX5CPU | <p>The following functions and settings are available in a project for FX5CPUs.*³</p> <ul style="list-style-type: none"> Extended file register (ER) Real-time monitor Web server setting MODBUS/TCP setting Time setting (SNTP client) | Page 922 Checking logging data in version 1.063R or earlier |
| | <ul style="list-style-type: none"> Logging data displayed in GX LogViewer can be monitored on a program editor by using the offline monitor function. | |

Version 1.042U

| Item | Description | Reference |
|-----------------------------|--|---|
| Verification | When "Hide System Generated Items" is selected from the pull-down list in a Verify Result screen (detailed display), the following instruction codes are not displayed. <ul style="list-style-type: none">• NOP• LD TMP• OUT TMP | Page 158 Detailed display (program) |
| Label editor | <ul style="list-style-type: none">• The selection status of "Access from External Device" can be pasted to other rows. | Page 237 Editing a row |
| Ladder program | <ul style="list-style-type: none">• A label comment of a structure member can be edited in the "Input Comment" screen. | Page 295 Entering/editing comments |
| FBD/LD editor SFC editor | <ul style="list-style-type: none">• A tool hint is displayed while options for labels are displayed. | Page 330 Configuration of an FBD/LD editor Page 354 Configuration of an SFC diagram editor |

Version 1.044W

| Item | Description | Reference |
|-----------------------------|---|---|
| Opening another format file | In a ladder program, a program in which any of the following instructions is used and the argument is omitted can be read. <ul style="list-style-type: none">• D(P).DDRD, D(P).DDWR, JP.READ, JP.SREAD, JP.WRITE, JP.SWRITE, GP.READ, GP.SREAD, GP.WRITE, GP.SWRITE, J.ZNRD, J.ZNWR, JP.ZNWR, JP.ZNRD | Page 110 Opening a GX Works2 format project Page 113 Opening a PX Developer format project |

Version 1.045X

| Item | Description | Reference |
|--|---|---|
| Operating environment (operating system) | <ul style="list-style-type: none"> Windows 10 IoT Enterprise 2016 LTSB is supported. | — |
| Navigation window | <ul style="list-style-type: none"> Unused data in a program is displayed in light blue. | Page 53 Navigation window |
| Search/replacement | <p>After the cursor jumped from a search result to a program editor, label editor, or SFC block list, by using the following menu, the cursor jumps forward or backward from the current position to the positions where search or replacement was applied.</p> <ul style="list-style-type: none"> [Find/Replace] ⇨ [Previous]/[Next] | <p>Page 62 Basic menus</p> <p>Page 463 Searching for/ Replacing Devices and Labels</p> <p>Page 465 Searching for/ Replacing Instructions</p> <p>Page 466 Searching for/ Replacing Character Strings</p> <p>Page 468 Changing Contacts between Open Contact and Close Contact</p> <p>Page 472 Displaying cross reference information</p> |
| | <ul style="list-style-type: none"> The ranges for search and replacement can be specified in a device comment editor. | Page 461 Range specification in editors |
| | <ul style="list-style-type: none"> An argument of a function block, argument of a function, and member of a structure can be searched for/replaced. | Page 463 Searching for/ Replacing Devices and Labels |
| | <p>Options for labels can be displayed when entering a label name in the following functions.</p> <ul style="list-style-type: none"> Device/label search Device/label replacement Open/close contact change Device batch replacement | <p>Page 463 Searching for/ Replacing Devices and Labels</p> <p>Page 468 Changing Contacts between Open Contact and Close Contact</p> <p>Page 469 Batch Replacing of Devices and Labels</p> |
| Library | <p>The following menu is available even when the element selection window is not displayed:</p> <ul style="list-style-type: none"> [Project] ⇨ [Library Operation] ⇨ [Register to Library List] | Page 62 Basic menus |
| | <ul style="list-style-type: none"> A library which is associated with a simple motion module can be used. | Page 523 Using a library associated with a module |
| | <ul style="list-style-type: none"> Password authentication for a read-protected POU can be disabled. | <p>Page 528 Creating a library file</p> <p>Page 533 Utilizing an element</p> |
| | <ul style="list-style-type: none"> An option to automatically check whether or not all the user libraries are updated is added. | Page 535 Checking for library updates automatically |
| Options | <p>The following options are added:</p> <ul style="list-style-type: none"> "Project" ⇨ "Navigation" ⇨ "Display Setting" ⇨ "Imported Library POU" ⇨ "Display Read-only POU" "Project" ⇨ "Navigation" ⇨ "Display Setting" ⇨ "Imported Library POU" ⇨ "Display Read-protected POU" ⇨ "Display Password Authentication Disabled POU" "Convert" ⇨ "Basic Setting" ⇨ "Operational Setting" ⇨ "Check the ladders in which certain instructions are used at inappropriate positions" "Other Editor" ⇨ "Label Editor Common" ⇨ "Fix the Number of Display Windows" "Program Editor" ⇨ "ST Editor" ⇨ "Editor Display Items" ⇨ "Highlight Matching Brackets" "Find/Replace" ⇨ "Cross Reference" ⇨ "Find Condition" ⇨ "Include Assigned Device in Finding Label Name" | Page 85 Option Settings for Each Function |
| Printing | <ul style="list-style-type: none"> In the "Print" screen, only the background color of a print result can be set to white. When printing a ladder program, the number of rows for device comments and the number of rows for wrapping a device/label name can be set in the "Print" screen. | Page 93 Printing Data |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> The device/label automatic-assign setting can be utilized to the CPU parameter of GX Works3. | <p>Page 110 Opening a GX Works2 format project</p> <p>Page 940 Correcting parameters</p> |
| | <p>The parameters of the following modules can be imported:</p> <ul style="list-style-type: none"> Input modules (QX70, QX71, QX72) CC-Link IE Controller Network-equipped module (QJ71GP21S-SX) | Page 110 Opening a GX Works2 format project |
| Verification | <ul style="list-style-type: none"> Unconverted functions and function blocks are displayed in the "Verify Result" window. The "Caution" column is added in the [Result List] tab of the "Verify Result" window. | <p>Page 151 Verifying Projects</p> <p>Page 615 Verifying Programmable Controller Data</p> |

| Item | Description | Reference |
|---|---|---|
| Module configuration diagram | <ul style="list-style-type: none"> The station numbers of the modules controlled by a CPU module in another station are no longer displayed. The parameter information of a cut or copied module object are utilized to the parameter information of the paste destination. | Page 196 Editor configuration when creating a module configuration diagram Page 202 Application of parameter information |
| CC-Link configuration window | The following iQ Sensor Solution functions are available in projects for an RnCPU and an RnENCPU: ^{*5} <ul style="list-style-type: none"> Automatic detection of connected devices Data backup/restoration Sensor/device monitor | Page 218 iQ Sensor Solution functions |
| Ethernet configuration window | The following iQ Sensor Solution functions are available in projects for an RnCPU and an RnENCPU: ^{*5} <ul style="list-style-type: none"> Data backup/restoration Sensor/device monitor | |
| iQ Sensor Solution function ^{*5} | <ul style="list-style-type: none"> This function is available in a project using a CC-Link-AnyWireASLINK bridge module. | |
| Changing a module | A module name, module type, and station type of the following modules can be changed from the shortcut menu. <ul style="list-style-type: none"> Another CPU module CC-Link IE built-in Ethernet module CPU extension module | Page 230 Change Module |
| Ladder editor | <ul style="list-style-type: none"> When entering an undefined label, a comment can be entered in the "Input Comment" screen. | Page 276 Creating a Ladder Program |
| | <ul style="list-style-type: none"> After pasting a ladder program including functions and function blocks to another project, if pasting the program again, the FB/FUN file is no longer pasted. Values in the "Increment Value" column of the "Continuous Paste" screen can be copied and pasted. | Page 301 Pasting Page 302 Pasting device numbers or label names consecutively |
| | The following uses are added to a simple search function. <ul style="list-style-type: none"> Displaying instructions and labels by pressing the [Ctrl] + [Space] keys. Cross-searching a standard program and a safety program for a device Searching for a statement or note. | Page 306 Simple search |
| | By using the following menu, the cursor jumps forward or backward from the current position to the positions where search was applied. <ul style="list-style-type: none"> [Find/Replace] ⇒ [Previous]/[Next] | |
| ST editor FBD/LD editor | <ul style="list-style-type: none"> Device type specifiers can be added to devices index-modified devices. | Page 320 Creating an ST Program Page 330 Creating an FBD/LD Program |
| FBD/LD editor | <ul style="list-style-type: none"> A function to correct the layout in an FBD network block is added. (The function to delete the blank column in FBD network blocks is integrated with this function.) | Page 346 Layout correction |
| Memory size calculation | <ul style="list-style-type: none"> By selecting the version ('12 and earlier versions' or '13 and later versions') of an RnSFCPU in the "Confirm Memory Size (Offline)" screen, the memory capacity can be calculated according to the selected version. | Page 446 Calculating Memory Size |
| Cross reference | <ul style="list-style-type: none"> When searching for a label that includes a label of "VAR_GLOBAL_CONSTANT" or "VAR_CONSTANT" class in the array element, a device which is assigned to the label to be searched is displayed. | Page 472 Displaying cross reference information |
| Device list | <ul style="list-style-type: none"> Display format can be set in a batch. When opening the device list without selecting a device, the mouse cursor is displayed in the text box of the toolbar in the list. When re-opening the device list, the mouse cursor is displayed at the same position as before the list was closed. | Page 480 Displaying Device Usage |
| Simulation | Simulations in the following projects are supported. <ul style="list-style-type: none"> Project for an R00CPU, an R01CPU, or an R02CPU Project for an RnPSFCPU When simulating a project for an RnSFCPU (R08SFCPU, R16SFCPU, R32SFCPU, or R120SFCPU), the capacity of signal memory to be used (for FB) increases. | Page 538 PROGRAM SIMULATION |
| I/O system setting | The following instructions can be used for a condition of setting data. <ul style="list-style-type: none"> INT_TO_REAL REAL_TO_INT DINT_TO_REAL REAL_TO_DINT | Page 570 Creating setting data |
| Connection destination setting | <ul style="list-style-type: none"> A CPU module can be accessed via a QCPU (Q mode). | Page 590 Accessing via QCPU (Q mode) |
| Writing data to a programmable controller | <ul style="list-style-type: none"> For RnCPUs, RnENCPUs, and RnSFCPUs, a file with no changes from the previous writing is not written to a CPU module.^{*3} | Page 601 Skip overwriting data |

| Item | Description | Reference |
|--|---|---|
| Writing data to a programmable controller Online program change | <ul style="list-style-type: none"> For an RnSFCPU project, a standard program, standard FB, and standard FUN excluding the program restoration information can be written to a CPU module.*³ | Page 600 Program restoration information Page 624 Program restoration information |
| Online program change | <ul style="list-style-type: none"> For RnCPUs and RnENCPUs, the online program change can be performed for an SFC active block. | Page 621 Online program change of SFC programs |
| | <ul style="list-style-type: none"> For an RnPCPU (redundant mode) project, the online program change can be performed for program files, FB files, and FUN files without including the program restoration information.*³ | Page 623 Program transfer during the online program change |
| | <ul style="list-style-type: none"> For an RnPCPU (redundant mode) project, program restoration information can be written in the background process.*³ | Page 624 Program restoration information |
| Monitoring | <ul style="list-style-type: none"> When monitoring a program in an FBD/LD editor or SFC editor, word devices with device type specifiers are displayed in the data types corresponding to the specifiers. | Page 643 Word device |
| Device/buffer memory batch monitor | When using the following menu in a ladder editor, FBD/LD editor, or SFC diagram editor, the "Device/Buffer Memory Batch Monitor" window appears and a monitoring is started. <ul style="list-style-type: none"> Right-click on the screen, and select [Online] from the shortcut menu ⇒ [Device/Buffer Memory Batch Monitor]. | Page 654 Checking Device/Buffer Memory in a Batch |
| Watch | <ul style="list-style-type: none"> Label options can be displayed when entering a label name. Device type specifiers can be added to devices index-modified devices. | Page 659 Registering to a watch window |
| Registering/canceling forced input/output* ³ | When connecting to a following CPU, input/output devices can forcibly be turned ON/OFF. <ul style="list-style-type: none"> R00CPU, R01CPU, R02CPU RnPCPU (process mode/redundant mode) | Page 666 Turning Input/Output Devices ON/OFF Forcibly |
| Pause FB/restart FB | <ul style="list-style-type: none"> During a program execution, the execution of a process control function block can be paused or restarted. Process control function blocks whose operations are temporarily paused can be displayed and checked in a list. | Page 672 Pausing/Restarting the Operation of Function Blocks |
| PX Developer Monitor Tool interaction | <ul style="list-style-type: none"> Assignment information database files used for the GOT screen generator of PX Developer Monitor Tool can be exported. | Page 688 PX Developer Monitor Tool interaction |
| User authentication | <ul style="list-style-type: none"> "Assistant Developers" is added to the access level of user.*³ | Page 707 Preventing Illegal Access to a Project (User Authentication) |
| Offline monitor | <ul style="list-style-type: none"> Label values displayed in GX LogViewer can be monitored on a program editor. | Page 922 Checking logging data in version 1.063R or earlier |
| Diagnostic | The following information can be displayed in the CC-Link IE Field Network diagnostics. <ul style="list-style-type: none"> Error history in a device station | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | The following modules can be diagnosed: <ul style="list-style-type: none"> CC-Link IE Field Network Basic remote I/O modules (NZ2MF2S1-32D, NZ2MF2S1-32T, NZ2MF2S1-32TE1, NZ2MF2S1-32DT, NZ2MF2S1-32DTE1) CC-Link IE Field Network remote I/O modules (NZ2GF12A-60IOLH8, NZ2GFSS2-16DTE, NZ2GFSS2-8D, NZ2GFSS2-8TE, FCU8-EX564, FR-A8NCE) MELIPC (MI5122-VW) | Page 744 CC-Link IE Field Network Basic diagnostics Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | <ul style="list-style-type: none"> The simple CPU communication diagnostics function is available.*³ | Page 748 Simple CPU communication diagnostics |
| Safety operation mode switching | <ul style="list-style-type: none"> The file size of a safety project does not increase when switching the safety operation mode of a CPU module without changing data in the project. | Page 794 Safety operation mode switching |

| Item | Description | Reference |
|--------------------------------------|--|---|
| CC IE Field configuration window | <ul style="list-style-type: none"> MELSOFT FieldDeviceConfigurator can be started by double-clicking a CC-Link IE Field Network waterproof remote I/O-Link module (NZ2GF12A-60IOLH8) that is placed in this window. When MELSOFT FieldDeviceConfigurator is started, the following items set in GX Works3 are applied to the configurator: start I/O number and network number of the master station, station numbers of device stations, and connection destination setting information. <p>(To use this function, it is required that Version 1.02C or later of MELSOFT FieldDeviceConfigurator has been installed.)</p> | MELSOFT FieldDeviceConfigurator Operating Manual |
| | <ul style="list-style-type: none"> When setting module parameters of a safety remote I/O module in the "Parameter Processing of Device Station" screen, "Wiring selection of input" are set as follows: If "1: Double wiring (NC/NC)" is set in a wiring selection of input Xn (n: even number), the same setting is automatically applied to Xn+1 which makes a pair with Xn. Strings copied in another application such as Excel can be pasted to the station list in this window. | — |
| Interaction with iQ Works (FX5CPU)*2 | <p>The following operations can be performed in MELSOFT Navigator:</p> <ul style="list-style-type: none"> Applying label information assigned in wirings (CHs) of analog inputs/outputs in an electrical CAD file which is imported in MELSOFT Navigator to global labels in GX Works3 Setting global labels in GX Works3 for label information assigned in wirings (CHs) of analog inputs/outputs in MELSOFT Navigator, and exporting the label information as an electric CAD file | |
| FX5CPU | <ul style="list-style-type: none"> A power supply capacity and I/O points can be checked. | Page 206 Checking the power supply capacity and I/O points |
| | <ul style="list-style-type: none"> A simulation environment file can be saved. A simulation environment file can be opened. | Page 565 Saving a simulation environment file Page 566 Opening a simulation environment file |
| | <ul style="list-style-type: none"> The GOT transparent function, which connects a personal computer and a GOT, and the GOT and a CPU on Ethernet, is available.*4 | Page 589 Accessing via GOT (GOT Transparent Function) |

Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|------------------|---------------------------------------|--|--|--|
| CPU parameter | RnCPU RnENCPU | | "Memory/Device Setting" ⇔ "Device/Label Memory Area Setting" ⇔ "Cassette Setting" ⇔ "Battery-less Option Cassette Setting" | Newly added |
| | RnSFCPU | | Memory/Device Setting" ⇔ "Device/Label Memory Area Setting" ⇔ "Device/Label Memory Area Capacity Setting" ⇔ "Device/Label Memory Configuration Confirmation" | In a safety project, the configuration of the device/label memory area can be checked. |
| Module parameter | RnCPU RnENCPU | | "Application Settings" ⇔ "Web Server Settings" | Newly added |
| | | | "Application Settings" ⇔ "Simple CPU Communication Setting" | Newly added |
| | RnCPU RnENCPU RnPCPU RnSFCPU | High speed data logger module (RD81DL96) MES interface module (RD81MES96) | "Basic Settings" ⇔ "Various Operations Settings" ⇔ "Mode Settings" | "Online(Asynchronous Mode)" can be selected. |

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Version 1.047Z

| Item | Description | Reference |
|--|---|--|
| Cross reference | <ul style="list-style-type: none"> When searching for a label by entering the name of the device which was assigned to a label, only the label that the name of assigned device completely matches with the entered name is displayed in the search result. | Page 472 Displaying cross reference information |
| Monitoring (FBD/LD editor, SFC diagram editor) | <p>The following contents are improved in the monitor value display area of variable elements.</p> <ul style="list-style-type: none"> It is displayed at the front when overlapping. The font size is increased. The position can be changed. It can be enlarged. | Page 645 Monitor value display area of variable elements |
| Device test with execution conditions | <p>While running a ladder program of a project for which any of the following CPU modules, a device or label value can be changed according to the conditions which were set in advance.*³</p> <ul style="list-style-type: none"> RnCPU RnENCPU | Page 668 Changing Device/Label Value by Setting Conditions |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> Instructions that are automatically replaced in an ST or FBD/LD program are increased. | Page 941 Automatic replacement of elements (GX Works3 Version 1.047Z or later) |
| PROFIBUS Configuration Tool | <p>In projects for an RnPCPU (redundant mode), an RnSFCPU, and an RnPSFCPU, the following functions of PROFIBUS Configuration Tool are available.</p> <ul style="list-style-type: none"> Upload Configuration Image Download Configuration Image <p>(To use this function, it is required that Version 1.01B or later of PROFIBUS Configuration Tool has been installed.)</p> | MELSEC iQ-R PROFIBUS-DP Module User's Manual (Application) |
| Writing data to a programmable controller | <ul style="list-style-type: none"> Unused structures can be written to a CPU module. An error message is displayed when writing of device comments fails. | — |
| Reading data from a programmable controller | <ul style="list-style-type: none"> Unused structures are read as unconverted ones. When reading module parameters of a CC-Link IE Field Network module, a message indicating to check whether the parameters of a device station needs to be deleted is displayed. | |
| Watch | <ul style="list-style-type: none"> By entering a value right after a device or label that is displayed in a program editor and whose data type is not the bit type is registered in a watch window, the current value can be changed to the entered value. | |
| FX5CPU | <ul style="list-style-type: none"> When using the online program change function, a program and program restoration information can separately be written.*³ | Page 624 Separate writing of a program and program restoration information (FX5CPU only) |

Parameters

| Category | Module type | Module | Parameter* ³ * ⁴ | Description |
|---------------|-------------|--------|--|-------------|
| CPU parameter | FX5CPU | | "Program Setting" ⇔ "Program Capacity Setting" | Newly added |

Version 1.050C

| Item | Description | Reference |
|--|--|---|
| Work window | <ul style="list-style-type: none"> Floating work windows can be combined as one window. | Page 52 Combining work windows in one window |
| Options | <p>The following option is added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Autofit Text Size" | Page 85 Option Settings for Each Function |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> The MELSOFT connection extended setting of high-speed universal model QCPUs can be applied to the module parameter of GX Works3. | Page 110 Opening a GX Works2 format project |
| Opening a GX IEC Developer format project | <ul style="list-style-type: none"> When opening a GX IEC Developer format project in GX Works3, the comments of an IL/MELSEC IL programs and FBD/LD programs can be imported with left-aligned. | Page 118 Opening a GX IEC Developer format project |
| Property | <ul style="list-style-type: none"> When saving a project, data can be compressed. | Page 145 Compressing a project file |
| Verification | <p>The details of the verification results of the following programs are displayed in the detailed display (diagram/table format) screen.</p> <ul style="list-style-type: none"> Ladder program FBD/LD program SFC program | Page 153 Checking a verification result |
| Tag FB | <ul style="list-style-type: none"> Up to 1000 tag FBs can be registered into a project. | Page 260 Registering Tag FBs Page 688 Exporting an assignment information database file |
| Ladder editor | <p>When a ladder editor is split, the focus on the editor can be moved by using the following menu.</p> <ul style="list-style-type: none"> [Window] ⇒ [Split Window Operation] ⇒ [Focus on Next Window]/[Focus on Previous Window] | Page 276 Configuration of a ladder editor |
| | <p>By using the following menu, the character size is automatically adjusted according to the display magnification of a ladder editor.</p> <ul style="list-style-type: none"> [View] ⇒ [Text Size] ⇒ [Autofit] | |
| | <p>By using the following menu, the display magnification of a ladder editor is automatically adjusted according to the window width.</p> <ul style="list-style-type: none"> [View] ⇒ [Zoom] ⇒ [Fit the editor width to the window width] | |
| | <ul style="list-style-type: none"> Ladder editors displayed vertically can individually be scrolled. | Page 279 Splitting a ladder editor |
| | <ul style="list-style-type: none"> Even when the definition of a function block or function is deleted, the FB instance or function on the ladder program will not be deleted. Ladder blocks that contain FB instances or functions can be copied from a project including the definitions of the function blocks or functions to a project including no definition. | Page 288 Function block whose definition is unclear Page 291 Function whose definition is unclear |
| ST editor Device comment editor Device memory editor | <p>When a ladder editor is split, the focus on the editor can be moved by using the following menu.</p> <ul style="list-style-type: none"> [Window] ⇒ [Split Window Operation] ⇒ [Focus on Next Window]/[Focus on Previous Window] | Page 320 Configuration of an ST editor Page 413 Configuration of a device comment editor Page 449 Configuration of a Device Memory Editor |
| FBD/LD editor SFC diagram editor | <p>By setting the following options, text layout of a newly added comment element can be set.</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Comment element text layout" "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Comment element text layout" | Page 330 Creating an FBD/LD Program Page 353 Creating an SFC Program |
| | <ul style="list-style-type: none"> Text layout can be set for each comment element. | — |
| | <ul style="list-style-type: none"> Tab characters can be used for comment elements. | |
| Creating a program | <ul style="list-style-type: none"> Sequential Function Chart language is supported in a project for an RnPCPU (redundant mode).³ | Page 353 Creating an SFC Program |
| SFC diagram editor | <ul style="list-style-type: none"> When creating a block or deleting all SFC elements in an SFC program, 'S0' is assigned to the initial step. | |
| Reading sample comments | <p>Sample comments of the following intelligent function modules can be read.</p> <ul style="list-style-type: none"> RD60P8-G RD60P8-G(Q) R60ADI8-HA RE81WH | Page 420 Reading sample comments |
| Program check | <ul style="list-style-type: none"> Devices assigned to labels are included in the target of the duplicated coil check. | Page 430 Target of duplicated coil check |

| Item | Description | Reference |
|-------------------------------------|--|--|
| Memory size calculation | <p>For the following CPU modules, by selecting the version of a CPU module in use in the "Confirm Memory Size (Offline)" screen, the memory capacity of global label assignment information can be calculated.</p> <ul style="list-style-type: none"> RnCPU and RnENCPU: '40 and later versions' RnSFCPU: '16 and later versions' | Page 446 Calculating Memory Size |
| Search/replacement | <ul style="list-style-type: none"> The display status of "Find/Replace Options" in the "Find and Replace" window is retained even after exiting GX Works3. | <p>Page 463 Searching for/Replacing Devices and Labels</p> <p>Page 465 Searching for/Replacing Instructions</p> <p>Page 466 Searching for/Replacing Character Strings</p> <p>Page 468 Changing Contacts between Open Contact and Close Contact</p> <p>Page 469 Batch Replacing of Devices and Labels</p> |
| Cross reference | <ul style="list-style-type: none"> When selecting a device or label in an editor, the row of the device or label in the search result of a cross reference window is also selected. | Page 475 Device or label selected in an editor |
| | <ul style="list-style-type: none"> By displaying a cross reference window while a local label is selected in a program editor, the names of both the program in which the label is used and the label are automatically entered in the input field in the window. By entering a label name, to which a character string such as a program file name is appended, in the input field, the type and range of the labels to search for can be specified. | <p>Page 474 Specification method for label type and range</p> <p>Page 475 Local label selected in an editor</p> |
| Simulation | <ul style="list-style-type: none"> Functions that use an SD memory card can be simulated by creating a virtual SD memory card file. | Page 562 SD memory card |
| | <p>The following operations can be performed for GX Simulator3.</p> <ul style="list-style-type: none"> RnCPUs, RnENCPUs, and RnSFCPUs: omission of writing files that are not changed RnPCPU (redundant mode): background processing of program transfer (writing the program restoration information) during the online program change | <p>Page 601 Skip overwriting data</p> <p>Page 623 Program transfer during the online program change</p> |
| | <p>A project including the following module can be simulated:</p> <ul style="list-style-type: none"> CC-Link IE Controller Network module (RJ71GP21S-SX) | Page 994 Modules supported by GX Simulator3 |
| | <p>The following CPU module functions are available:</p> <ul style="list-style-type: none"> RnCPUs, RnENCPUs, RnPCPU, RnPSFCPU, and RnSFCPU: writing to an SD memory card/reading from an SD memory card RnCPU and RnENCPU: real-time monitor, memory dump, web server, online change (SFC block), local device and label specification for target data/condition specification of the data logging function RnPCPU: external input/output forced on/off RnSFCPU: selection writing of program restoration information, LED control setting for program restoration information write status | Page 1004 Supported CPU module functions |
| | <p>A virtual SD memory card is available when using the following CPU module functions.</p> <ul style="list-style-type: none"> RnCPU, RnENCPU, RnPCPU, RnSFCPU, and RnPSFCPU: device/file usage setting, label communication from GOT RnCPU, RnENCPU, RnPCPU: event history | |
| | <p>The following instructions are available:</p> <ul style="list-style-type: none"> Output instruction (DELTA(P)) Reading/writing data instructions | Page 1015 Supported instructions |
| | <p>"Memory Card" can be selected in the following CPU parameter items:</p> <ul style="list-style-type: none"> "File Setting" ⇒ "Initial Value Setting" ⇒ "Target Memory" "RAS Setting" ⇒ "Event History Setting" ⇒ "Save Destination" <p>This makes it possible to write the following files to a virtual SD memory card file.</p> <ul style="list-style-type: none"> Device initial value file Global label initial value file Local label initial value file Event history file | Page 1019 Supported parameters |
| | <p>The following memory card parameter is available:</p> <ul style="list-style-type: none"> Setting of File/Data Use or Not in Memory Card | |
| | <p>The following module parameter is available:</p> <ul style="list-style-type: none"> Web Server Settings | |
| Specifying a connection destination | <ul style="list-style-type: none"> GX Works3 can access an RnPSFCPU by using the GOT transparent function⁴. | Page 589 Accessing via GOT (GOT Transparent Function) |

| Item | Description | Reference |
|---|---|--|
| Writing data to a programmable controller | <ul style="list-style-type: none"> For an RnPCPU, a file with no changes from the previous writing is not written to a CPU module.*³ | Page 600 Writing data to a programmable controller |
| | <ul style="list-style-type: none"> When writing a program to a CPU module after converting all programs, all the programs which are displayed in the "Online Data Operation" screen are automatically selected their checkboxes. | Page 601 Skip overwriting data |
| File password | <ul style="list-style-type: none"> A password can be registered for files in the SD memory card inserted in a personal computer. | Page 630 File password function Page 717 Preventing Illegal Data Reading/Writing (File Password) |
| Monitoring | <ul style="list-style-type: none"> Ladder editor: The monitor values of devices which are used as the arguments for input/output labels of a standard function or a standard function block are displayed in the data types of the input/output labels. ST editor: The monitor value of a device which is used as an argument of an instruction is displayed in the data type corresponding to that of the instruction. | Page 640 Ladder Page 642 ST |
| | <ul style="list-style-type: none"> While monitoring a program in an SFC diagram editor, activated steps can be displayed.*³ | Page 651 Monitoring SFC steps which were activated |
| Registering/canceling forced input/output | <ul style="list-style-type: none"> When connecting to an RnSFCPU, input/output devices can forcibly be turned ON/OFF.*³ | Page 666 Turning Input/Output Devices ON/OFF Forcibly |
| User authentication | <ul style="list-style-type: none"> Users can log on to a project and a CPU module as a guest user. (It is required that the CPU module supports 'Assistant Developers.*³) | Page 708 Guest user |
| Diagnostics | <ul style="list-style-type: none"> When connecting a personal computer to a sub-master station which operates as the master station in CC-Link IE Field network using a USB cable, the "Sensor/Device Monitor" screen appears. | Page 730 Sensor/Device Status Check |
| | <ul style="list-style-type: none"> The name of a program block in an FB file or a FUN file where a CPU error occurs is displayed in the module diagnostics screen. | Page 733 Module Diagnostics |
| | The following modules can be diagnosed: <ul style="list-style-type: none"> CC-Link IE Field Network block type remote IO-Link module (NZ2GF2S-60IOLD8) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | <ul style="list-style-type: none"> Ethernet modules can be diagnosed in the simple CPU communication diagnostics.*⁴ | — |
| AnyWireASLINK configuration window | <ul style="list-style-type: none"> In a project using a CC-Link-AnyWireASLINK bridge module, up to 256 remote modules can be placed in this window. | |
| AnyWireASLINK configuration window | Item names in this window are changed as follows: | |
| Sensor/device monitor | <ul style="list-style-type: none"> "Transmission Points"→"Bit Data Points" "Occupied I/O Pts"→"Occupied Bit Pts" and "Occupied Word Pts" | |
| CC-Link configuration window | Item names in this window are changed as follows: <ul style="list-style-type: none"> "Intelligent Buffer Select (Word)"→"Intelligent Buffer Selection (decimal-word unit)" | |
| CC IE Field configuration window | <ul style="list-style-type: none"> When opening this window, "Assignment Method" which was previously selected is displayed. | |
| | <ul style="list-style-type: none"> When copying and pasting a device station in this window, its parameters are also copied and pasted. | |
| | The "Device No. Reassignment" screen appears by selecting the following menu. In this screen, device numbers can sequentially be assigned to the link devices on a device station. <ul style="list-style-type: none"> [CC IE Field Configuration] ⇨ [Device No. Reassignment] | |
| | The following function is available when connecting a personal computer and the sub-master station that operates as a master station in CC-Link IE Field Network with a USB cable: <ul style="list-style-type: none"> Automatic detection of connected devices | |
| | Initial values or read values can be applied to write values by clicking the following buttons in the "Parameter Processing of Device Station" screen: <ul style="list-style-type: none"> Copy "Initial Value" to "Write Value" Copy "Read Value" to "Write Value" | |
| | <ul style="list-style-type: none"> A safety module can be enabled when writing parameters to the module by selecting the checkbox of "Enable safety module when succeed to write parameter" in the "Parameter Processing of Device Station" screen. | |
| | <ul style="list-style-type: none"> The "Parameter Processing of Device Station" screen can be closed with discarding current changes by clicking the [Cancel] button in the screen. | |
| | | |
| FX5CPU | <ul style="list-style-type: none"> The system monitor function is available.*³ | Page 727 Module Status Check of a System |
| | <ul style="list-style-type: none"> The sensor/device monitor function can be performed in a project using AnyWireASLINK. | Page 730 Sensor/Device Status Check |
| | The following modules can be diagnosed: <ul style="list-style-type: none"> FX5-20PG-P, FX5-20PG-D, FX5-ENET | Page 733 Module Diagnostics |
| | <ul style="list-style-type: none"> The simple CPU communication diagnostics function is available.*³ | — |

Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|------------------|-------------------------|---|---|-----------------------------|
| CPU parameter | RnPCPU (redundant mode) | | "Redundant System Settings" ⇒ "Redundant Behavior Setting" ⇒ "Setting to Wait Receiving Cyclic Data after Switching System" | Newly added |
| | | | "Redundant System Settings" ⇒ "Tracking Setting" ⇒ "Tracking Device/Label Setting" ⇒ "Device/Label Detailed Setting" ⇒ "<Detailed Setting>" | Step relays (S) can be set. |
| Module parameter | RnCPU RnENCPU | | "Basic Settings" ⇒ "Own Node Settings" ⇒ "Communications by Network No./Station No." | Newly added |
| | | | "Application Settings" ⇒ "Network/Station No. <-> IP information setting" | Newly added |
| | RCPU | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇒ "MODBUS/TCP Settings" | Newly added |
| | | | "Application Settings" ⇒ "Simple CPU Communication Setting" | Newly added |

Version 1.052E

| Item | Description | Reference |
|---|--|---|
| Options (RCPU) | The following option is added: • "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize Level" | Page 86 Optimization of the number of steps |
| | The following option is changed. • Before change (version 1.015R to 1.050C) "Optimize the Number of Steps": Yes • After change (version 1.052E) "Optimize the Number of Steps": Yes "Optimize Level": Level 1 | |
| FX5CPU (Verifying data with a programmable controller) | When verifying the device memory with the default settings, special relays (SM) and special registers (SD) are not verified. | Page 616 Device memory |



Version 1.055H

| Item | Description | Reference |
|-------------------------------------|--|---|
| Process control function | <ul style="list-style-type: none"> Initial values of FB properties saved in a project can be exported to a CSV file. The initial values of FB properties can be imported from the CSV file into the project. | Page 23 List of functions supporting a process control system Page 408 FB property management (offline) |
| | <ul style="list-style-type: none"> Execution intervals and phases of an FBD/LD program for process control can be set in the "Program File Setting" screen. | Page 25 Process control extension toolbar Page 275 Execution interval and phase |
| Menu | The following menus are changed. <ul style="list-style-type: none"> Before change (version 1.032J to 1.054G) [Online] ⇒ [FB Property] ⇒ [Update the Initial Value of FB Property]/[FB Property Management] After change (version 1.055H) [Online] ⇒ [FB Property Management (Online)] | Page 62 Basic menus Page 689 FB Property Management (Online) screen |
| Multiple comments | <ul style="list-style-type: none"> Comments of elements, which have been used in a project, such as common instructions or module FBs can be read. | Page 84 Reading comments |
| | <ul style="list-style-type: none"> Comments of the following elements are applied to the same read destination as sample comments: common instructions, standard functions, standard function blocks, module FBs, and module labels. Therefore, while displaying sample comments in an editor, the comments of the other elements such as common instructions or module FBs can be displayed. | — |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> The parameters of a channel isolated pulse input module (QD60P8-G) can be imported. | Page 111 Data to be changed |
| | <ul style="list-style-type: none"> Elements that are automatically replaced in an ST or FBD/LD program are increased. | Page 941 Automatic replacement of elements (GX Works3 Version 1.047Z or later) |
| Copying and pasting | <ul style="list-style-type: none"> When copying and pasting a program block including a function or a function block to another project, whether to copy the FB file or the FUN file of the elements can be selected. | Page 133 Copying and pasting data |
| | <ul style="list-style-type: none"> A program block including a module FB can be copied and pasted to another project. | |
| Verification | <ul style="list-style-type: none"> A verification result of an ST program can be displayed in a list. Details of a verification result of an ST program are displayed in the detailed display (diagram/table format) screen. Only the mismatched data can be displayed in the detailed display (diagram/table format) screen. | Page 158 Detailed display (program) Page 162 Detailed display (diagram/table format) |
| Reading sample comments | <ul style="list-style-type: none"> When adding an intelligent function module to a project, sample comments for the module can be read. | Page 216 Setting parameters Page 420 Reading sample comments |
| CC-Link IE TSN configuration window | <ul style="list-style-type: none"> In projects for an RnCPU and an RnENCPU, a CC-Link IE TSN system can be configured using this window. | Page 217 Setting network configuration and target devices MELSEC iQ-R CC-Link IE TSN User's Manual (Application) |
| | The following items can be set for a device station: <ul style="list-style-type: none"> Motion Control Station PDO Mapping Setting Communication Period Setting | |
| | The PDO mapping parameters of device stations can be set in a batch by using the following menu: <ul style="list-style-type: none"> [CC-Link IE TSN Configuration] ⇒ [Batch Setting of PDO Mapping] | |
| | The following functions are available for CC-Link IE TSN supported devices: <ul style="list-style-type: none"> Connected/disconnected module detection Parameter of device station Command execution of device station | |
| Device assignment confirmation | <ul style="list-style-type: none"> Refresh devices which are assigned to a device station can be checked when using a CC-Link IE TSN module. | Page 219 Checking refresh devices assigned to a module |
| | <ul style="list-style-type: none"> Content in the "Explanation" column displayed in the link device list of the "Device Assignment Confirmation" screen can be applied to the device comment for each refresh device when using a CC-Link IE TSN module. | Page 221 Applying explanations to device comments |
| Module tool list | The following modules are supported. (Predefined Protocol Support Tool For Positioning) <ul style="list-style-type: none"> RJ71C24 RJ71C24-R2 RJ71C24-R4 | Page 226 Displaying the module tool list |

| Item | Description | Reference |
|---|--|---|
| Assigned device check | <ul style="list-style-type: none"> Devices assigned to the global label can be checked if there is a same device assigned to another label. | Page 251 Checking assigned devices |
| Structure definition | <ul style="list-style-type: none"> Reserved area capacities of structure members can be set in the "Properties" screen of a structure definition. The online program change can be used after editing a structure definition by setting the reserved area capacities. | Page 252 Setting reserved area capacities |
| Label editor | <ul style="list-style-type: none"> Data including devices assigned to structure members can be exported to an XML file. | Page 255 Exporting/importing a label Page 256 XML file |
| Creating a program Search/replacement Watch | <p>If "Yes" is selected for the following option, devices and labels for which a device comment has been set can be displayed as options by entering a device comment when searching for/replacing a device, inputting it in a program, or registering it in a watch window.</p> <ul style="list-style-type: none"> "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Device to Which Device Comment Has Been Set" | Page 281 Inserting contacts, coils, instructions, arguments Page 323 Inserting instructions, functions, and control syntax Page 336 Using the edit box Page 416 Device comment including @ Page 463 Searching for/Replacing Devices and Labels Page 468 Changing Contacts between Open Contact and Close Contact Page 469 Batch Replacing of Devices and Labels Page 659 Registering to a watch window |
| Importing/exporting ladder programs (CSV file) | <ul style="list-style-type: none"> When importing a program including a function block or function, the function block, function, and FB instance can be imported as undefined elements. | Page 309 Importing from a CSV file |
| ST editor | <ul style="list-style-type: none"> Change tracking of a program is displayed. | Page 320 Configuration of an ST editor |
| FBD/LD editor | <ul style="list-style-type: none"> By pressing the + / / / keys, the cursor can be moved on an editor without selecting elements. | Page 330 Configuration of an FBD/LD editor |
| | <ul style="list-style-type: none"> The display format for Input/output labels of a function element and a function block element can be changed to their label comments. | |
| | <ul style="list-style-type: none"> The size of a comment element, function element, and function block element can be changed. | Page 332 Elements Page 343 Changing the element size |
| SFC diagram editor | <ul style="list-style-type: none"> By pressing the + / / / keys, the cursor can be moved on an editor without selecting elements. | Page 354 Configuration of an SFC diagram editor |
| | <ul style="list-style-type: none"> By selecting [View] ⇒ [Open Zoom/Start Destination Block] on a step, the action (Zoom) assigned to the step can be opened. | |
| Device comment | <ul style="list-style-type: none"> By using '@' in device comments, options of devices can be refined when searching for/replacing a device, inputting it in a program, or registering it in a watch window. | Page 416 Device comment including @ |
| Device memory editor | <ul style="list-style-type: none"> Only the values within the range specified in a device memory editor can be written to/read from a CPU module. | Page 453 Writing/Reading Data to/from CPU Module |
| Highlighting display | <ul style="list-style-type: none"> A row displayed in the following windows and screen can be highlighted: a cross reference window, the "Output" window, and the "Find Result" screen. | Page 477 Highlighting display |
| Library | <ul style="list-style-type: none"> A project including a module label or a module FB can be exported as a library file. | — |
| | <ul style="list-style-type: none"> If an element with the same name as one in a library file to be imported exists in a project, the element can be overwritten in importing the file. | Page 533 Utilizing an element |
| | <ul style="list-style-type: none"> Multiple elements can be utilized to a project in a batch. | |
| | <ul style="list-style-type: none"> Elements created in Ladder Diagram language or Sequential Function Chart language can be updated. | Page 535 Updating library POU's |
| Connection destination setting | <ul style="list-style-type: none"> An Ethernet board to communicate with an RCP module can be selected in GX Works3. | Page 580 Specifying the Ethernet adapter on the personal computer side |
| | <ul style="list-style-type: none"> A CPU module can be accessed via QJ71E71-100. | Page 591 Accessing via QJ71E71-100 |
| Parameter of a device station on CC-Link IE TSN ^{*3,4} | <ul style="list-style-type: none"> Parameters of a device station on CC-Link IE TSN can be written to, read from, or deleted from a CPU module or the SD memory card inserted in the CPU module. When writing parameters of a device station on CC-Link IE TSN to a CPU module or an SD memory card inserted in the CPU module, the parameters are automatically set to the device station. | Page 603 Parameter Page 610 Parameters Page 625 File batch online change |

| Item | Description | Reference |
|---|--|--|
| Writing data to a programmable controller ^{*3} | <ul style="list-style-type: none"> In a project for an RnPCPU, only the program restoration information of a program file, FB file, and FUN file can be written to a CPU module. | Page 600 Program restoration information |
| | <ul style="list-style-type: none"> Writing of a memory card parameter which has not been changed can be skipped. Even when selecting an SD memory card as the writing destination, writing of data which has not been changed can be skipped. | Page 601 Skip overwriting data |
| Online program change ^{*3} | <ul style="list-style-type: none"> In a project for an RnPCPU, only the program restoration information of a program file, FB file, and FUN file can be written to a CPU module. | Page 600 Program restoration information |
| | <ul style="list-style-type: none"> Safety data can be written to an RnSFCPU in the test mode. | Page 617 Writing Programs While a CPU Module is in the RUN State |
| | <ul style="list-style-type: none"> The online change (SFC block) can be performed for an RnPCPU. | Page 621 Online program change of SFC programs |
| Monitoring (ST editor) | <p>By using the following menu, the right half of the split window can be displayed or hidden.</p> <ul style="list-style-type: none"> [Monitor] ⇒ [Switch ST Monitor Display (All)]/[Switch ST Monitor Display (Bit Type Only)] | Page 642 ST |
| Watch | <ul style="list-style-type: none"> The display format of a device or label can be changed. The data type of a device can be changed. | Page 659 Operating a watch window |
| | <p>When comments have been set in the following device comments, those local devices are displayed as options by entering '/' at the end of a program file name.</p> <ul style="list-style-type: none"> Common device comment Each program device comment with the same name as the program file name | Page 659 Registering to a watch window |
| Device test with execution conditions ^{*3} | <ul style="list-style-type: none"> In a project for an RnPCPU, a device or label value can be changed according to the conditions set in advance. | Page 668 Changing Device/Label Value by Setting Conditions |
| PX Developer Monitor Tool interaction | <ul style="list-style-type: none"> When exporting an assignment information database file, an "_" (underscore) at the end of a tag name can be deleted. | Page 688 Exporting an assignment information database file |
| Sensor/device monitor | <p>The following display items are added:</p> <ul style="list-style-type: none"> Transmission cycle time for bit and word data Input status of a word remote module | Page 730 Sensor/Device Status Check |
| Diagnostics | <p>The following modules can be diagnosed in projects for an RnCPU and an RnENCPU:</p> <ul style="list-style-type: none"> CC-Link IE TSN module (RJ71GN11-T2) DC safety I/O module (NZ2GFS12A2-14DT, NZ2GFS12A2-16DTE) DC input/transistor output combined modules (NZ2GN2B1-32DT, NZ2GN2B1-32DTE, NZ2GN2S1-32DT, NZ2GN2S1-32DTE) DC input modules (NZ2GN2B1-32D, NZ2GN2S1-32D) Transistor output modules (NZ2GN2B1-32T, NZ2GN2B1-32TE, NZ2GN2S1-32T, NZ2GN2S1-32TE) Analog input modules (NZ2GN2B-60AD4, NZ2GN2S-60AD4) Analog output modules (NZ2GN2B-60DA4, NZ2GN2S-60DA4) Inverters (FR-A800-GN, FR-F800-GN) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| Options | <p>The default value for the following option is changed.</p> <ul style="list-style-type: none"> Before change (version 1.052E to 1.054G) "Optimize Level": Level 2 After change (version 1.055H) "Optimize Level": Level 1 | Page 916 Using a project, which was created in version 1.055H or later, in version 1.050C or earlier |
| | <p>The following options are added:</p> <ul style="list-style-type: none"> "Project" ⇒ "Add New Module" ⇒ "Operation Setting" ⇒ "Read Sample Comment" "Program Editor" ⇒ "Common Item" ⇒ "Verify" ⇒ "Verify Setting" ⇒ "Minimize the Detailed Display (List Format)" "Program Editor" ⇒ "ST Editor" ⇒ "Verify" ⇒ "Verify Setting" ⇒ "Minimize the Detailed Display (List Format)" "Program Editor" ⇒ "ST Editor" ⇒ "Editor Display Items" ⇒ "Track Changes" "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Comment" ⇒ "Display Item" ⇒ "Switch FB/FUN Argument to Comment" "Other Editor" ⇒ "Label Editor Common" ⇒ "Extended Display Setting" ⇒ "Item Name to Show in Hierarchy Display Area" "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display the Device to Which Device Comment Has Been Set" "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Show a completion message when the window is automatically closed in executing"/"Show a write completion message in completing writing to Safety PLC" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Structured Data Type" ⇒ "Enable to Set Reserved Area" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the Consistency of Global Label" "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "PX Developer Monitor Tool Interaction" ⇒ "Remove Underscore at the End of Tag Name" | — |

| Item | Description | Reference |
|---------------------------------------|---|--|
| Simulation | The following operation can be performed for GX Simulator3. • RnPCPU: omission of writing files that are not changed | Page 601 Skip overwriting data |
| | A project including any of the following modules can be simulated: • Main base unit (R33B) • Channel isolated pulse input modules (RD60P8-G, RD60P8-G(Q)) • HART communication analog input module (R60ADI8-HA) • Energy measuring module (RE81WH) | Page 994 Modules supported by GX Simulator3 |
| | The following CPU module functions are available: • RnCPUs, RnENCPUs, and RnPCPUs: SFC-activated step monitor • RnCPUs, RnENCPUs, and RnSFCPUs: event history logging restriction • RnCPUs and RnENCPUs: device test with execution conditions • RnPCPU (redundant mode): Program execution (SFC support), SFC program (diagram) monitor (SFC support) • RnSFCPUs: external input/output forced on/off | Page 1004 Supported CPU module functions |
| | The following instructions are available: • RnCPUs and RnENCPUs: file operation instructions, data processing instructions (SORTTBL(_U), SORTTBL2(_U), DSORTTBL2(_U)) • R00CPU, R01CPU, and R02CPU: data shift instructions, clock instructions (DATE2SEC(P)(_U), SEC2DATE(P)(_U)) • RnPCPU (redundant mode): SFC control instructions, SFC dedicated instruction • RnSFCPU: safety system instruction | Page 1015 Supported instructions |
| | The following CPU parameter is available: • RnPCPU (redundant mode): SFC Setting | Page 1019 Supported parameters |
| | • A multiple CPU system in which an RnSFCPU is set as the CPU No.1 can be simulated. | — |
| | • A monitoring interval can be specified for monitoring data of an RnCPU or an RnENCPU with the realtime monitor function. | |
| Opening a PX Developer format project | If a specific condition is satisfied, the setting of the following option is changed to "Yes." • "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "PX Developer Monitor Tool Interaction" ⇒ "Remove Underscore at the End of Tag Name" | Page 963 Tag names to which an underscore is added |
| | • Elements that are automatically replaced in an FBD/LD program are increased. | Page 961 Automatic replacement of instructions |
| e-Manual Viewer interaction | • Sample programs including a function block (ladder programs) can be used in GX Works3. | Page 1046 Using Sample Programs |

| Item | Description | Reference |
|---|--|---|
| Printing | <ul style="list-style-type: none"> When printing a ladder program or an FBD/LD program, label comments displayed in the program editor can be printed by selecting the checkbox of "Device/Label Comment" in the "Print" screen. When printing an FBD/LD program, by selecting the checkbox of "FB/FUN Argument Comment" in the "Print" screen, the program can be printed with the display format for the input/output labels of function and function block elements changed to their label comments. The module information of AnyWireASLINK configuration can be printed. | — |
| AnyWireASLINK configuration window | <ul style="list-style-type: none"> When "10: 0 points (0 input points/0 output points)" is set for "Transmission points setting" in the module parameter for RJ51AW12AL, "0 points (No Bit Data)" is displayed for "Bit Data Points" in this window. The content displayed for "TX Cycle Time (Approx.)" in this window switches depending on the value set for "To use or not to use word data setting" in the module parameters for RJ51AW12AL. <p>The following iQ Sensor Solution functions are available for word remote modules:^{*5}</p> <ul style="list-style-type: none"> Automatic detection of connected devices Sensor parameter read/write Sensor/device monitor Data backup/restoration | |
| CC IE Field configuration window | <ul style="list-style-type: none"> Refresh devices are displayed. <p>Supplementary information of refresh devices can be displayed by selecting the following menu:</p> <ul style="list-style-type: none"> [View] ⇒ [Docking Window] ⇒ [Supplementary Information] <p>Object names can be displayed or hidden by selecting the following menu:</p> <ul style="list-style-type: none"> [View] ⇒ [Object Name Display] <p>The object name of a target module can be replaced with the module name selected as a replacement candidate by selecting the checkbox of the following item in the "Replace General CC IE Field Module" screen:</p> <ul style="list-style-type: none"> Replace the object name of replacement target module to the module name selected in replacement candidate | |
| Ladder editor | <ul style="list-style-type: none"> By pressing  +  keys while directly entering a label comment or device comment on an editor, the entire character string of the comment can be selected. | |
| Continuous paste screen (Ladder editor) | <ul style="list-style-type: none"> The paste direction selected in this screen is applied to the next and subsequent continuous paste. | |
| Conversion | <ul style="list-style-type: none"> When a device with latch setting has been assigned to the 'VAR_GLOBAL' class or a device without latch setting to the 'VAR_GLOBAL_RETAIN' class in the global setting, a conversion error occurs. | |
| Simple CPU communication diagnostics | <p>Up to 512 rows of the communication destination network statuses can be displayed in the "Simple CPU Communication Diagnostics" screen while diagnosing the following modules.</p> <ul style="list-style-type: none"> _RJ71EN71 (E+IEC) _RJ71EN71 (E+IEF) RJ71EN71 (E+CCIEC) RJ71EN71 (E+CCIEF) RJ71EN71 (E+E) | |
| Others | <ul style="list-style-type: none"> The S.PHPL2 instruction can be used in a project for an RnPCPU. The CPU module data backup/restoration function is available in a project for an RnPCPU.^{*3} Saving an event history log is restricted in projects for an RnCPU and an RnENCPU.^{*3} | |
| Options (FX5CPU) | <p>The following option is added:</p> <ul style="list-style-type: none"> "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize Level" | Page 86 Optimization of the number of steps |
| Memory size calculation (FX5CPU) | <ul style="list-style-type: none"> Capacities of labels and latch labels can be displayed in a graph in the "Confirm Memory Size (Offline)" screen. | Page 446 Calculating Memory Size |
| Simulation (FX5CPU) | <p>By selecting "Yes" for the following option, parameters, programs, and optional data are automatically written to GX Simulator3 when simulation is started:</p> <ul style="list-style-type: none"> "Simulation" ⇒ "Start Simulation" ⇒ "Operational Setting" ⇒ "Automatically write programs and parameters when starting simulation." | Page 542 Starting a simulation |

| Item | Description | Reference |
|--|---|-----------|
| Result of power supply capacity and I/O points check window (FX5CPU) | <p>The following items are added in the window:</p> <ul style="list-style-type: none"> • Total Number of Points (Current/Maximum) • Number of I/O Points (Current/Maximum) • Number of Remote I/O Points (Current/Maximum) • Actual Number of Input Points for Control • Actual Number of Output Points for Control <p>24 VDC current consumption is divided into the following two kinds and displayed separately:</p> <ul style="list-style-type: none"> • Internal consumption current • External consumption current <p>• Display contents can be exported to a CSV file by clicking the [Output the CSV file] button.</p> <p>• Column titles can be copied by selecting all the items and copying them.</p> | — |
| CC-Link IEF Basic configuration window (FX5CPU) | <p>The default value of the following item in the "Link Scan Setting" screen is changed to "500 ms."</p> <ul style="list-style-type: none"> • "Remote Station Disconnect Detected Setting" ⇒ "Time-out Period" | |

■Parameters

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|------------------|-------------|--------|---|--|
| System parameter | RnSFCPU | | "Multiple CPU Setting" ⇒ "Communication Setting between CPU" ⇒ "Fixed Scan Communication Area Setting" | Newly added |
| | | | "Inter-module Synchronization Setting" ⇒ "Select Inter-module Synchronization Target Module" ⇒ "<Detailed Setting>" | "Synchronize" can be selected in the "Setting" column for an RnSFCPU in the "Select the Synchronous Target Module" screen. |
| CPU parameter | RnCPU | | "Memory/Device Setting" ⇒ "Link Direct Device Setting" | Newly added |
| | RnSFCPU | | "RAS Setting" ⇒ "Error Detections Setting" ⇒ "Synchronous Interrupt Program (I44,I45) Executing Time Excessive" | Newly added |
| | | | "RAS Setting" ⇒ "CPU Module Operation Setting at Error Detection" ⇒ "Synchronous Interrupt Execution Interval Error (CPU Module)" | Newly added |
| | | | "Refresh Setting between Multiple CPUs" ⇒ "Refresh Setting (At I45 Exe.)" | Newly added |
| | | | "Program Setting" ⇒ "<Detailed Setting>" | 'I44' and 'I45' can be set in the "Event Execution Type Detailed Setting" screen. |

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|-----------------------|---------------------------------------|--|--|--|
| Module parameter | RCPU | Channel isolated digital-analog converter modules (R60DA8-G, R60DA8-G(Q), R60DA16-G) | "Application setting" ⇒ "Disconnection detection function" | Newly added |
| | | CC-Link IE Controller Network modules (RJ71GP21-SX(R), RJ71GP21S-SX(R)) | "Application Settings" ⇒ "Link points extended setting" | Newly added |
| | | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇒ "Simple CPU Communication Setting" ⇒ "<Detailed Setting>" | <ul style="list-style-type: none"> Up to 512 rows can be set for "Setting No." "On Request" can be set for "Communication Setting." "MELSEC-A/AnS (Ethernet Module)" and "MELSEC-FX3 (Block/Adaptor)" can be selected for "Communication Destination." The communication destinations can be filtered. |
| | RnCPU RnENCPU RnPCPU RnSFCPU | OPC UA server module (RD81OPC96) | "Basic Settings" ⇒ "Various Operations Settings" ⇒ "Mode Settings" | "Online(Asynchronous Mode)" can be selected. |
| | | Flexible high-speed I/O control module (RD40PD01) | "Application setting" ⇒ "ADCValue logging function" | Newly added |
| | | Ethernet interface modules (_RJ71EN71(CCIEC), _RJ71EN71(E+IEC), RJ71EN71(CCIEC), RJ71EN71(E+CCIEC)) | "Application Settings" ⇒ "Link points extended setting" | Newly added |
| | | AnyWireASLINK master module (RJ51AW12AL) | "Basic setting" ⇒ "Easy replacement enable/disable setting for one slave module" | Newly added |
| | RnCPU RnENCPU | CC-Link IE TSN module (RJ71GN11-T2) | "Basic Settings" ⇒ "Refresh Setting" ⇒ "<Detailed Setting>" | Link side devices can be set in a batch. (Page 224 Setting link side devices in a batch (CC-Link IE TSN)) |
| Memory card parameter | RnCPU RnENCPU | | "Setting of File/Data Use or Not in Memory Card" ⇒ "Device Station Parameter" | Newly added |

Version 1.056J

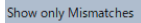
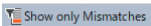
| Item | Description | Reference |
|---------------------------------|--|--|
| Motion control setting function | <ul style="list-style-type: none"> The motion control setting function is available. | Page 227 Motion control setting function |
| Diagnostics | <p>The following module can be diagnosed in projects for an RnCPU and an RnENCPU:</p> <ul style="list-style-type: none"> CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64) Servo amplifiers (MR-J5-G, MR-J5W2-G, MR-J5W3-G) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |

Version 1.057K

| Item | Description | Reference |
|----------------------------|--|--|
| Multiple comments | <ul style="list-style-type: none"> Comments of libraries can be read. | Page 84 Reading comments |
| Project version management | <ul style="list-style-type: none"> A project update revision history can be managed for each data. | Page 62 Basic menus Page 172 Project Version Management |
| Verification | By selecting "Yes" for the following option, the label memory can be verified. <ul style="list-style-type: none"> "Other Editor" ⇒ "Label Editor Common" ⇒ "Verify" ⇒ "Include Label memory as Verify Target" | Page 151 Verification |
| | <ul style="list-style-type: none"> Details on the verification results of global labels, local labels, structures, and device comments are displayed in the detailed display (diagram/table format) screen. | Page 162 Detailed display (diagram/table format) |
| Global label editor | <ul style="list-style-type: none"> Devices assigned to structure members can be deleted in a batch. | Page 247 When data type is structure |
| | The cursor can jump to the following option from the extension display area. <ul style="list-style-type: none"> "Other Editor" ⇒ "Label Editor Common" ⇒ "Extended Display Setting" ⇒ "Item Name to Show in Hierarchy Display Area" | |
| Memory size calculation | <ul style="list-style-type: none"> The title of the "Size" column changes according to the unit selected for "Display Unit" in the "Confirm Memory Size (Offline)" screen. (Example: If "Byte" is selected, "Size (Byte)" is displayed as the title.) | Page 446 Calculating Memory Size |
| Simulation | The following functions and instruction can be simulated. <ul style="list-style-type: none"> Simple CPU communication setting function Database function Database access instruction | Page 1004 CPU module (RnCPU, RnENCPU, RnPCPU, LHCPU) Page 1011 MELSEC iQ-R and MELSEC iQ-L series common functions Page 1015 Application instruction Page 1045 Database |
| Monitoring | Monitoring for all the windows are stopped automatically when data is converted or all programs are converted during monitoring. | Page 633 Starting/stopping monitoring |

| Item | Description | Reference |
|-----------------------------|--|---|
| Options | <p>The following option name is changed.</p> <ul style="list-style-type: none"> • Before change (version 1.055H to 1.056J) Display the Device to Which Device Comment Has Been Set • After change (version 1.057K) Display the Corresponding Device in Entering Device Comment | <p>Page 281 Inserting contacts, coils, instructions, arguments</p> <p>Page 323 Inserting instructions, functions, and control syntax</p> <p>Page 336 Using the edit box</p> <p>Page 416 Device comment including @</p> <p>Page 463 Searching for/ Replacing Devices and Labels</p> <p>Page 468 Changing Contacts between Open Contact and Close Contact</p> <p>Page 469 Batch Replacing of Devices and Labels</p> <p>Page 659 Registering to a watch window</p> |
| | <p>The following options are added:</p> <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Element (Ladder Symbol)" ⇒ "Display Format" ⇒ "Number of Cells for Device/Label Name" • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FB/FUN" ⇒ "Display Format" ⇒ "Number of Wrapping Rows for Instance Name" • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FB/FUN" ⇒ "Display Format" ⇒ "Number of Cells for Instance Name" • "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "FBD/LD Element" ⇒ "Display Format" ⇒ "Number of Cells for Device/Label Name" • "Other Editor" ⇒ "Label Editor Common" ⇒ "Verify" ⇒ "Include Label memory as Verify Target" • "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Stop the Monitor in Executing Convert/Rebuild All" | — |
| Printing | <p>An FBD/LD program can be printed according to the settings in the following options.</p> <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Element (Ladder Symbol)" ⇒ "Display Format" ⇒ "Number of Cells for Device/Label Name" • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FB/FUN" ⇒ "Display Format" ⇒ "Number of Wrapping Rows for Instance Name" • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FB/FUN" ⇒ "Display Format" ⇒ "Number of Cells for Instance Name" | |
| FBD/LD editor SFC editor | <p>When a structure member the data type of which is any of the following is used as an LD element or FBD element, a comment set for the member can be displayed in a program editor.</p> <ul style="list-style-type: none"> • Timer • Long timer • Retentive timer • Long retentive timer • Counter • Long counter | |

Version 1.060N

| Item | Description | Reference |
|---|---|---|
| Navigation window | <ul style="list-style-type: none"> Program files, program blocks, and worksheets can be sorted by execution order in a batch. | Page 55 Sorting data |
| Opening a GX Works2 format project | <ul style="list-style-type: none"> Projects for LCPUs are supported. | Page 110 Opening a GX Works2 format project |
| Opening a GX Developer format project | <ul style="list-style-type: none"> A project for a QSCPU which is created in GX Developer can be opened. | Page 62 Basic menus Page 127 Opening a GX Developer format project |
| Verification | <p>Only the mismatched data can be displayed by using the following menu while the "Verify Result" window is displayed.</p> <ul style="list-style-type: none"> [View] ⇒ [Show only Mismatches] | Page 78 Available menus when displaying the verify result window Page 153 Checking a verification result |
| | <p>An icon on the toolbar in the detailed display (diagram/table format) screen is changed.</p> <ul style="list-style-type: none"> Before change (version 1.050C to 1.058L):  After change (version 1.060N):  | Page 163 Displaying mismatched data only |
| | <ul style="list-style-type: none"> A verification result displayed in the detailed display (diagram/table format) screen can be exported to a file. | Page 165 Exporting to a file |
| Overwriting a project Project revision history | <ul style="list-style-type: none"> When a project revision can be registered when overwriting the project. | Page 130 Registering a revision Page 169 Registering a revision when a project is overwritten |
| iQ Sensor Solution function ^{*5} | <ul style="list-style-type: none"> This function is available in a project in which a CC-Link IE Field-AnyWireASLINK bridge module is used. | Page 218 iQ Sensor Solution functions |
| Motion control setting function | <ul style="list-style-type: none"> Public labels set with the motion control setting function can be registered as module labels in a global label editor of GX Works3. | Page 258 Registering public labels set with the motion control setting function |
| Ladder editor | <ul style="list-style-type: none"> When using the continuous pasting function, an increment target can be selected. | Page 302 Pasting device numbers or label names consecutively |
| | <ul style="list-style-type: none"> An FB instance name can be changed by double-clicking the name. | Page 285 Changing an FB instance name |
| | <ul style="list-style-type: none"> When a cell is cut in the insert mode, its lines are deleted from the editor. | — |
| | <ul style="list-style-type: none"> An inline structured text box remains when deleting a line that does not include the inline structured text box from a parallel circuit including the inline structured text box. | — |
| | <ul style="list-style-type: none"> When displaying only a ladder block for which a line statement is set, another line statement can be inserted in the ladder block. | — |
| Ladder editor ST editor | <p>The following functions are available:</p> <ul style="list-style-type: none"> FB property FB property management (offline) FB property management (online) | Page 388 Displaying an FB property Page 408 FB Property Management (Offline) screen Page 689 FB Property Management (Online) screen |
| FBD/LD editor | <ul style="list-style-type: none"> An FB instance name can be changed by double-clicking the name. | Page 333 FBD element |
| FBD/LD editor SFC diagram editor | <p>The text layout of an comment element can be changed to the following three types:</p> <ul style="list-style-type: none"> Align Top Align Middle Align Bottom | Page 334 Common element |
| SFC diagram editor | <p>When a comment of transition No. overlaps with a jump symbol or connection line, the size of the transition can be changed by selecting the following menu.</p> <ul style="list-style-type: none"> [Edit] ⇒ [Modify] ⇒ [Toggle Transition Size] | Page 366 Entering comments of Transition No. |
| Reading sample comments | <p>Sample comments of the following intelligent function modules can be read.</p> <ul style="list-style-type: none"> RD81MES96N R60MH112 R60MH112NA | Page 420 Reading sample comments |

| Item | Description | Reference |
|---|--|--|
| Memory size calculation | <ul style="list-style-type: none"> "Display Unit" displayed in the "Confirm Memory Size (Offline)" screen is changed to "Size Display Unit." | Page 446 Calculating Memory Size |
| | The memory capacities of the following data can be displayed: <ul style="list-style-type: none"> Program Label Latch label | |
| | The memory capacities of the following data can be displayed in projects for an RnCPU, an RnENCPU, and an RnPCPU: <ul style="list-style-type: none"> Label Latch label | |
| | The memory capacities of the following data can be displayed in projects for an RnSFCPU and an RnPSFCPU: <ul style="list-style-type: none"> Label Latch label Safety label Standard/safety shared label | |
| Device memory | <ul style="list-style-type: none"> Device memory data can be exported to a CSV file. | Page 454 Exporting/Importing Device Memory Data |
| | <ul style="list-style-type: none"> One point can be specified for "Word Multi-point Format" in the "Display Format" screen. | Page 449 Setting the display format |
| Cross reference window | <ul style="list-style-type: none"> The cursor can remain in a cross reference window when jumping to each editor from the window. | Page 472 Displaying cross reference information |
| | <ul style="list-style-type: none"> Device or label options can be displayed when entering a device or label name in the input field. | Page 474 Device/label options |
| Simulation | A project including the following module can be simulated: <ul style="list-style-type: none"> CC-Link IE TSN module | Page 994 Supported modules Page 1032 Network |
| | <ul style="list-style-type: none"> The network functions and parameters of CC-Link IE TSN are available. | |
| | The following CPU module functions are available: <ul style="list-style-type: none"> RnCPUs and RnENCPU: link direct device setting, extension of points for CC-Link IE Controller Network RnPCPU: device test with execution conditions, online change (SFC block) RnPCPU (process mode): Writing of program restoration information RnSFCPU: online change (ladder block) (safety program), file batch online change (safety program), multiple CPU synchronization interruption (I45), inter-module synchronous interrupt (I44), file batch online change of FB files and the global label setting file, file batch online change when the program memory does not have enough free space | Page 1004 Supported CPU module functions |
| | The following CPU parameter is available: <ul style="list-style-type: none"> Link Direct Device Setting | |
| Monitoring (Ladder editor) | <ul style="list-style-type: none"> If the current values of devices and labels are character strings, their monitor values are also displayed by the character strings. The number of characters for monitor values (strings) displayed in the monitor screen can be changed. | Page 640 Ladder |
| Device test with execution conditions ^{*3} | <ul style="list-style-type: none"> This function is available in a project for an RnSFCPU. | Page 668 Changing Device/Label Value by Setting Conditions Page 711 Functions and operations that require user authentication |
| Process control function | <ul style="list-style-type: none"> Up to four faceplates can be displayed at the same time. | Page 684 Checking tag data on the gauge window (faceplate) |
| Module diagnostics | <ul style="list-style-type: none"> When diagnosing an RnCPU, an RnENCPU, or an RnPCPU, "Switch Display" is displayed in the [Error Information] tab of the module diagnostics screen.^{*3} | Page 734 Error information |
| | <ul style="list-style-type: none"> When diagnosing an RnCPU, an RnENCPU, or an RnPCPU, the FB hierarchy information of the function block with an error can be displayed in the module diagnostics screen.^{*3} | Page 736 FB hierarchy information |

| Item | Description | Reference |
|-------------------------------------|--|--|
| Network diagnostics | The following modules can be diagnosed in projects for an RnCPU and an RnENCPU: • CC-Link IE TSN compatible motion modules (RD78GHV, RD78GHW) | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| | The following modules (CC-Link IE Field Network communication mode) can be diagnosed: ⁴ • DC input/transistor output combined modules (NZ2GN2B1-32DT, NZ2GN2B1-32DTE, NZ2GN2S1-32DT, NZ2GN2S1-32DTE) • DC input modules (NZ2GN2B1-32D, NZ2GN2S1-32D) • Transistor output modules (NZ2GN2B1-32T, NZ2GN2B1-32TE, NZ2GN2S1-32T, NZ2GN2S1-32TE) • Analog input modules (NZ2GN2B-60AD4, NZ2GN2S-60AD4) • Analog output modules (NZ2GN2B-60DA4, NZ2GN2S-60DA4) | |
| | The following modules can be diagnosed: • MR-JET-G • MR-J5-G-RJ • FR-E800-E • Partner products | |
| | • An icon indicating that the parameter automatic setting of a device station failed is displayed in the CC-Link IE TSN/CC-Link IE Field Network diagnostics. | |
| Firmware update | • The firmware of modules can be updated using GX Works3. | Page 62 Basic menus Page 806 Firmware Update |
| Printing | • When printing a ladder program, inline structured text programs are printed on another sheet only if the checkbox of "Print Inline Structured Text Program on a Separate Sheet" is selected in the "Print" screen. | — |
| AnyWireASLINK configuration window | • In a project in which a CC-Link IE Field-AnyWireASLINK bridge module is used, up to 256 remote modules can be placed in this window. | |
| CC-Link IE TSN configuration window | A mode set in the following parameter of a CC-Link IE TSN module is displayed: • "Application Settings" ⇒ "Module Operation Mode" • "Application Settings" ⇒ "Communication Mode" ⇒ "Communication Mode" | |
| | A device station can be replaced with a general CC-Link IE TSN module and vice versa by selecting the following menu: • [CC-Link IE TSN Configuration] ⇒ [Change Module] ⇒ [Replace General CC-Link IE TSN module]/[Change to General CC-Link IE TSN module] | |
| | The "Device No. Reassignment" screen appears by selecting the following menu. In this screen, device numbers can sequentially be assigned to the link devices on a device station. • [CC-Link IE TSN Configuration] ⇒ [Device No. Reassignment] | |
| | • The "PDO Mapping Setting" screen appears by double-clicking "Detail Setting" in the "PDO Mapping Setting" column. In this screen, the PDO mapping parameters can be set. | |
| CC IE Field configuration window | The following iQ Sensor Solution function is available in a project for an RnSFCPU: ⁵ • Data backup/restoration | |

| Item | Description | Reference |
|---|---|-----------|
| Label editor | <ul style="list-style-type: none"> Check results are displayed in the "Output" window by clicking the [Check] button. | — |
| ST editor | <ul style="list-style-type: none"> When registering a label as an argument of a function or function block, the data type according to the argument is displayed in the "Undefined Label Registration" screen. | |
| Reading data from a programmable controller | <ul style="list-style-type: none"> Program blocks are displayed in execution order when reading a program from a CPU module. (If a project is not opened when its program is read, the program files are also displayed in execution order.) When reading a project to which user information is registered from a CPU module while the project is not opened, the user can log on to the CPU module as a guest user. | |
| Verifying data with a programmable controller | <p>By clicking any of the following buttons in the [Verify] tab of the "Online Data Operation" screen, checkboxes of data both on the project and the programmable controller sides can be selected:</p> <ul style="list-style-type: none"> [Parameter + Program] button [Select Favorites] button [Select All] button <p>By clicking the [Open/Close All] button in the [Verify] tab of the "Online Data Operation" screen, the trees both on the project and programmable controller sides can be all expanded or collapsed.</p> <p>By clicking the [Deselect All] button in the [Verify] tab of the "Online Data Operation" screen, the checkboxes of data both on the project and programmable controller sides can be unselected.</p> | |
| Others | <ul style="list-style-type: none"> LHCPUs and MELSEC-L series modules are supported.*4 Saving an event history log is restricted in a project for an RnPCPU.*3 <p>The following functions are available in a project for an RnSFCPU:*3</p> <ul style="list-style-type: none"> MELSEC-Q series MELSECNET/H network module CPU module data backup/restoration function Sequence scan synchronization sampling function | |
| Options | <p>The following options are added:</p> <ul style="list-style-type: none"> "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Register to the Revision When Saving Project" "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Automatically Set Revision Titles" "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Display Confirmation Message Showing Whether to Register Revision" "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Optimize Revision Information to Reduce File Size" "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Number of Wrapping Rows for Device/Label Name" "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Target Device No./Label Name to Increment" "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Horizontal alignment of text layout for comment element" "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Vertical alignment of text layout for comment element" "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Horizontal alignment of text layout for comment element" "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Vertical alignment of text layout for comment element" "Find/Replace" ⇒ "Cross Reference" ⇒ "Operational Setting" ⇒ "Jump with cursor in jumping" "Find/Replace" ⇒ "Cross Reference" ⇒ "Operational Setting" ⇒ "Auto-fill device/label name to display based on input history" "Monitor" ⇒ "Ladder Editor" ⇒ "Character String Monitoring Setting" ⇒ "Numbers of Characters to Display" | |

| Item | Description | Reference |
|--------|--|--|
| FX5CPU | <ul style="list-style-type: none"> FX5UJCPUs are supported. | — |
| | <ul style="list-style-type: none"> Sample comments of a safety extension module (FX5-SF-MU4T5) can be read. | |
| | <p>The following option name is changed.</p> <ul style="list-style-type: none"> Before change (version 1.032J to 1.058L): "Online" ⇒ "Connection Destination Specification" ⇒ "Operational Setting" ⇒ "Show the Select Connection Destination window before showing the Specify Connection Destination window." After change (version 1.060N): "Online" ⇒ "Specify Connection Destination" ⇒ "Operational Setting" ⇒ "Show the Connection Destination Simple Setting window" | Page 577 Changing connection destination settings |
| | <p>The default value for the following option is changed.</p> <ul style="list-style-type: none"> Before change (version 1.055H to 1.058L) "Optimize Level": Level 1 After change (version 1.060N) "Optimize Level": Level 2 | <p>Page 86 Optimization of the number of steps</p> <p>Page 917 Using a project, which was created in version 1.060N or later, in version 1.055H or earlier</p> |

■Parameters

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|------------------|---------------------------------------|---|---|--|
| CPU parameter | RnPSFCPU | | "Redundant System Settings" ⇒ "Redundant Behavior Setting" ⇒ "Setting to Wait Receiving Cyclic Data after Switching System" | Newly added |
| | FX5CPU | | "Memory/Device Setting" ⇒ "Internal Buffer Capacity Setting" ⇒ "Function to Use Internal Buffer" | Related functions are displayed in the explanation column. |
| Module parameter | RCPU | | "Application Settings" ⇒ "Simple CPU Communication Setting" ⇒ "<Detailed Setting>" | Unset items can be displayed or hidden. |
| | LHCPU | | "Application Settings" ⇒ "Simple CPU Communication Setting" ⇒ "<Detailed Setting>" | Unset items can be displayed or hidden. |
| | FX5CPU | | "High Speed I/O" ⇒ "Input Function" ⇒ "High Speed Counter" ⇒ "<Detailed Setting>" | The [Simple Batch Setting] button is added in the "Setting Item" field. By clicking this button, the parameters of "High Speed Counter" can be set in the wizard format. |
| | FX5UCPU FX5UCCPU | | "485 Serial Port" ⇒ "Basic Settings" ⇒ "Communication Protocol Type" | Related functions are displayed in the explanation column by selecting "Predefined Protocol Support Function." |
| | RCPU | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇒ "Simple CPU Communication Setting" ⇒ "<Detailed Setting>" | The following options can be selected for "Communication Destination": |
| | | | | <ul style="list-style-type: none"> MELSEC iQ-L (built-in Ethernet) SIEMENS S7 series Fuji Electric MICREX-SX series JTEKT TOYOPUC series |
| | | | | When setting the following devices for "Communication Destination," PLC No.5 to 8 can be selected for "Target PLC No": |
| | RnCPU RnENCPU RnPCPU RnSFCPU | Serial communication modules (RJ71C24, RJ71C24-R2, RJ71C24-R4) | "MODBUS slave setting" | <ul style="list-style-type: none"> Fuji Electric MICREX-SX series |
| | | | | Unset items can be displayed or hidden. |
| | | | | Newly added |
| | RnCPU RnENCPU | CC-Link IE TSN module (RJ71GN11-T2) | "Application Settings" ⇒ "Communication Speed" | Newly added |
| | | | "Application Settings" ⇒ "Communication Mode" | Newly added |
| | RnPCPU (redundant mode) RnPSFCPU | Ethernet interface module (RJ71EN71(E+E)) | "Application Settings" ⇒ "Redundant System Settings" ⇒ "To Use or Not to Use Redundant System Settings" ⇒ "System Switching Request Issue at Communication Error" ⇒ "System Connection" ⇒ "Simple CPU Communication Port" | Newly added |
| | FX5CPU | | High speed pulse I/O modules (FX5-16ET/ES-H, FX5-16ET/ESS-H) | "Input Function" ⇒ "High Speed Counter" ⇒ "<Detailed Setting>" |
| | | | | The [Simple Batch Setting] button is added in the "Setting Item" field. By clicking this button, the parameters of "High Speed Counter" can be set in the wizard format. |

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|-----------------|-------------|--------|--|--|
| Remote password | FX5CPU | | "Module Conditions" ⇔ "Detail Setting" | "MELSOFT Transmission Port (UDP/IP)" is added in "System Connection Valid Setting" of the "Remote Password Detail Setting" screen. |

Version 1.061P

| Item | Description | Reference |
|--------|---|-----------|
| FX5CPU | <p>The following module tool is available in projects for an FX5UCPU and an FX5UCCPU.^{*3}</p> <ul style="list-style-type: none"> Predefined Protocol Support Tool For Positioning | — |

Version 1.063R

| Item | Description | Reference |
|------------------------------------|---|---|
| Opening a GX Works2 format project | <ul style="list-style-type: none"> Settings for MELSECNET/H and MELSECNET/10 in network parameters can be imported. | Page 110 Opening a GX Works2 format project |
| Network diagnostics | <p>The following module can be diagnosed:</p> <ul style="list-style-type: none"> MELSECNET/H network modules (RJ71LP21-25, RJ71LP21-25(R)) | Page 745 MELSECNET diagnostics |
| Check program screen | <ul style="list-style-type: none"> When opening this screen, "Check Content" that was previously set is displayed. | — |

Version 1.065T

| Item | Description | Reference |
|---------------------------------------|--|---|
| Printing | The following items can be set in the "Print" screen when printing an FBD/LD program: <ul style="list-style-type: none"> • Fit to One Page • Magnification | Page 96 Printing FBD/LD programs |
| | The following items can be set in the "Print" screen when printing an SFC program: <ul style="list-style-type: none"> • Do not Print Direct Expressions of Transitions • Do not Print Actions • Fit to One Page • Magnification | Page 97 Printing SFC programs |
| Opening another format project | The following functions are supported in a project for a redundant CPU: <ul style="list-style-type: none"> • Opening a GX Works2 format project • Opening a PX Developer format project | Page 110 Opening a GX Works2 format project Page 113 Opening a PX Developer format project |
| Opening a GX Developer format project | The following items can be imported: <ul style="list-style-type: none"> • Options • Device memory | Page 127 Opening a GX Developer format project |
| Project version management | Data to be registered can be verified with the latest data in a master project by performing any of the following operations in the "Register Data" screen: <ul style="list-style-type: none"> • Double-click data to be registered. • Select and right-click data to be registered, then select [Verify with the Latest Revision] from the shortcut menu. | Page 182 Data |
| | <ul style="list-style-type: none"> • By selecting and right-clicking revision(s) in the revision list, then selecting [Verify with the Previous Revision]/[Verify Between Revisions] from the shortcut menu, project files or data associated with the selected revision(s) can be verified with each other. | Page 186 Verifying a project file or data |

| Item | Description | Reference |
|-------------------------------------|--|--|
| CC-Link IE TSN configuration window | <ul style="list-style-type: none"> In a project for an RnSFCPU, a CC-Link IE TSN system can be configured using this window. | Page 217 Setting network configuration and target devices |
| | <ul style="list-style-type: none"> Parameters of a device station on CC-Link IE TSN can be written to, read from, or deleted from an RnSFCPU or an SD memory card inserted in the CPU module.*^{3,4} When writing parameters of a device station on CC-Link IE TSN to an RnSFCPU or an SD memory card inserted in the CPU module, the parameters are automatically set to the device station.*^{3,4} | Page 599 Data to be written and writing destinations Page 604 Parameters of a remote I/O module (device station) on CC-Link IE TSN Page 610 Parameters of a remote I/O module (device station) on CC-Link IE TSN |
| | The following functions are available for CC-Link IE TSN supported devices in a project for an RnSFCPU:* ^{3,4} <ul style="list-style-type: none"> Connected/disconnected module detection Parameter of device station Command execution of device station | — |
| | A mode set in the following parameter of a CC-Link IE TSN compatible motion module is displayed: <ul style="list-style-type: none"> "Application Settings" ⇒ "Module Operation Mode" | |
| | For a CC-Link IE TSN module, the following display items are added: <ul style="list-style-type: none"> Cyclic Transmission Time (Min.) Communication Period Interval (Min.) | |
| | An IP address, subnet mask, and default gateway can be displayed in hexadecimal by selecting the following menu: <ul style="list-style-type: none"> [Edit] ⇒ [IP Address Input Format] ⇒ [Hexadecimal] | |
| | Network topology can be changed to a ring topology by selecting the following menu: <ul style="list-style-type: none"> [CC-Link IE TSN Configuration] ⇒ [Change Transmission Path Method] ⇒ [Ring] | |
| | <ul style="list-style-type: none"> A station which got disconnected after a data link is detected as a disconnected device when performing 'connected/disconnected module detection.' "Reserved station" is displayed in "Reserved/Error Invalid Station" for the disconnected station. | |
| | <ul style="list-style-type: none"> Basic modules and extension modules can be placed in a batch by dragging and dropping a multiple-axis servo amplifier, such as MR-J5W2-G or MR-J5W3-G, onto the station list from the module list window. | |
| | <ul style="list-style-type: none"> PDO mapping parameters can be copied, cut, and pasted in the "PDO Mapping Setting" window. | |
| | <ul style="list-style-type: none"> "Motion Control Station" is displayed in the station list which is in a simple display mode when the own station is a CC-Link IE TSN compatible motion module. | |
| | <ul style="list-style-type: none"> If the number of link device points is deleted in the station list which is in a simple display mode, the start link device displayed in a detailed display mode is also deleted. | |
| | <ul style="list-style-type: none"> The [Error] and [Warning] buttons are added in the "Output" window; by clicking these buttons, error/warning messages can be displayed or hidden. The number of messages is displayed next to each button. | |
| | Object names can be displayed or hidden by selecting the following menu: <ul style="list-style-type: none"> [View] ⇒ [Object Name Display] | |
| Label editor | <ul style="list-style-type: none"> A multiple-dimensional array can be set by entering the number of elements for multiple dimensions in the "Data Type Selection" screen. | Page 244 Setting arrays for data type |
| | <ul style="list-style-type: none"> A row can be deleted while the list is filtered. | — |
| Ladder editor (excluding Zoom) | The colors of the following items can be changed in the "Color and Font" screen: <ul style="list-style-type: none"> Line Statement (Shown in Navigation Window) Background of Line Statement (Shown in Navigation Window) | |

| Item | Description | Reference |
|-----------------------------------|--|--|
| Ladder editor (including a Zoom) | The insert mode and overwrite mode can be switched by selecting the following menu: • [Edit] ⇒ [Switch Overwrite/Insert mode] | Page 69 Available menus when editing a ladder program |
| | The ladder edit mode of all open ladder editors can be switched by selecting the following menu: • [Edit] ⇒ [Ladder Edit Mode] ⇒ [Read Mode (All Windows)]/[Write Mode (All Windows)] | Page 69 Available menus when editing a ladder program Page 280 Switching the ladder edit mode (read/write/monitor read/monitor write) Page 1064 Edit |
| | The ladder edit mode of all ladder editors that exist in a project can be switched by selecting the following menu: • [Edit] ⇒ [Ladder Edit Mode] ⇒ [Read Mode (All Ladder Programs Elements)]/[Write Mode (All Ladder Programs Elements)] | |
| | The following item is added in a screen which appears in switching to the monitor write mode: • Check the consistency between the editing target program file in GX Works3 and the one in PLC. By selecting this checkbox, whether a program in GX Works3 matches with one in a programmable controller can be checked before switching the mode. | Page 280 Monitor write mode |
| | • 100 or more ladder blocks can be copied. (Up to 300 ladder blocks) • The number of selected ladder blocks is displayed on the title bar. | — |
| Inline structured text | • Up to 20,000 characters can be entered in an inline structured text box. | Page 292 Inserting an inline structured text box |
| | The number of rows to display (height) of an inline structured text box can be changed by using the following menu: • [View] ⇒ [Height Setting of Inline Structured Text] | Page 293 Changing the number of rows to display |
| ST program | The insert mode and overwrite mode can be switched by selecting the following menu: • [Edit] ⇒ [Switch Insert/Overwrite mode] | Page 72 Available menus when editing an ST program |
| | By selecting "Yes" for the following option, a syntax template is displayed with the arguments aligned vertically: • "Program Editor" ⇒ "ST Editor" ⇒ "Edit Operation" ⇒ "Vertically Align Arguments for Displaying Template" | Page 326 Displaying syntax templates |
| | • A constant label can be specified as an integer value of a CASE sentence. | — |
| FBD/LD program (including a Zoom) | Shortcut keys can be set for the following menus: • [Edit] ⇒ [Layout] ⇒ [Batch Correction of Layout in FBD Network Block] • [Edit] ⇒ [Layout] ⇒ [Delete the Blank Row Between FBD Network Blocks] • [Edit] ⇒ [Layout] ⇒ [Batch Alignment of All FBD Network Blocks to the Left] | |
| | • Elements can be connected to each other by the following procedure: Select a connection point or line, then move the cursor to a target connection point by pressing the Ctrl + ← / → / ↑ / ↓ keys. • An element connected to another element can be connect to a different element by the following procedure: Select a connection point or line. Then, move the cursor to a target connection point by pressing the Ctrl + Shift + ← / → / ↑ / ↓ keys. | Page 339 Common operations of elements |
| SFC program | By selecting the following menu, whether to automatically connect an SFC element and FBD/LD element with a connection line can be selected: • [Edit] ⇒ [Edit Mode] ⇒ [Element Auto-connect] | Page 74 Available menus when editing an SFC program (SFC diagram) |
| Data flow analysis | • The data flow analysis function is supported. | Page 482 Displaying a Range Affected by/Affecting a Device/Label |

| Item | Description | Reference |
|---------------------------------|---|--|
| Simulation | <ul style="list-style-type: none"> A project for an LHCPU can be simulated. The functions, instructions, and parameters of an LHCPU are available. | Page 994 Modules supported by GX Simulator3 Page 1001 Firmware versions of CPU modules Page 1004 CPU module (RnCPU, RnENCPU, RnPCPU, LHCPU) Page 1015 RCPUs and LHCPU Page 1022 LHCPU Page 1028 Module buffer memory Page 1030 Link devices of network module Page 1039 LHCPU Page 1040 General module |
| | RnCPU and RnENCPU projects including the following module can be simulated: <ul style="list-style-type: none"> CC-Link IE TSN compatible motion module | Page 556 Simple motion module/motion module Page 994 Modules supported by GX Simulator3 Page 1028 Module buffer memory Page 1030 Link devices of network module |
| | An RnSFCPU project including any of the following modules can be simulated: <ul style="list-style-type: none"> MELSECNET/H network modules (QJ71BR11, QJ71LP21(-25 S-25 G GE), QJ71NT11B) | Page 994 Modules supported by GX Simulator3 |
| | The following CPU module functions are available: <ul style="list-style-type: none"> RnCPUs and RnENCPU: FB hierarchy information RnSFCPU: device test with execution conditions, real-time monitor, CC-Link IE Controller Network function of the RJ71EN71 | Page 1004 CPU module (RnCPU, RnENCPU, RnPCPU, LHCPU) Page 1007 CPU module (RnPSFCPU, RnSFCPU) MELSEC iQ-R CPU Module User's Manual (Application) |
| | The following instructions are available: <ul style="list-style-type: none"> Module access instructions (RFS(P), COM(P), S(P).ZCOM) Process control instruction (S.PHPL2) | Page 1015 Supported instructions |
| | Projects for an RnCPU and an RnENCPU can be simulated while the following option is selected in "Communication Destination" of "Simple CPU Communication Setting": <ul style="list-style-type: none"> MELSEC iQ-L (built-in Ethernet) | Page 1021 Module parameter |
| Recording monitor ^{*3} | <ul style="list-style-type: none"> The recording status can be monitored. | Page 732 Recording Status Check |
| Module diagnostics | <ul style="list-style-type: none"> The display format of an error code can be switched between decimal and hexadecimal in the system monitor and the module diagnostics screen. | Page 727 Module Status Check of a System Page 733 Module Diagnostics |
| CC-Link diagnostics | <ul style="list-style-type: none"> The font color of the [Previous] and [Next] buttons is displayed in red when multiple screens exist. | Page 746 CC-Link diagnostics |
| Firmware update | <ul style="list-style-type: none"> The firmware of RnPCPUs can be updated using GX Works3. | Page 806 Firmware Update |
| Recording ^{*3} | <ul style="list-style-type: none"> This function is available in projects for RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU) and RnENCPU. | Page 759 Recording Function |

| Item | Description | Reference |
|-------------------------------|---|---|
| Memory dump ^{*4} | <ul style="list-style-type: none"> This function is available in a project for an RnSFCPU. (Only standard device values can be checked.) | — |
| Offline monitor ^{*4} | <ul style="list-style-type: none"> Device data of an RnSFCPU which is collected with the memory dump function can be monitored on a program editor. | |
| | <p>The following menus are changed.</p> <ul style="list-style-type: none"> Before change (version 1.030G to 1.063R) [Debug] ⇒ [Offline Monitor] ⇒ [Offline Monitor (Memory Dump)] [Debug] ⇒ [Offline Monitor] ⇒ [Offline Monitor (Logging)] ⇒ [Connection Destination Setting] [Debug] ⇒ [Offline Monitor] ⇒ [Offline Monitor (Logging)] ⇒ [Disconnect Offline Monitor] After change (version 1.065T) [Recording] ⇒ [Start Offline Monitor] ⇒ [Memory Dump] [Recording] ⇒ [Start Offline Monitor] ⇒ [Logging File] [Recording] ⇒ [Stop Offline Monitor] | |
| | <ul style="list-style-type: none"> Data collected with the recording function can be monitored. | Page 765 Checking Collected Data on Program Editor |
| | <p>The following functions are available:</p> <ul style="list-style-type: none"> Seek bar Log marker Event history (offline monitor) | Page 773 Operating the seek bar Page 777 Adding a log marker Page 779 Checking an event history (offline monitor) |
| | <p>The GOT offline monitor can be started in GX Works3.</p> | Page 785 Displaying the GOT offline monitor |
| Safety system | <ul style="list-style-type: none"> The safety communication function is available in an RnSFCPU project in which a CC-Link IE TSN module or CC-Link IE TSN compatible motion module is used.^{*4} | — |
| Module configuration diagram | <ul style="list-style-type: none"> In the system configuration check, the check result type for a connector conversion module is changed from 'Warning' to 'Information.' | |
| Device comment editor | <ul style="list-style-type: none"> When zooming this screen in and out, the column width is automatically adjusted according to the display magnification. | |
| Search/replacement | <ul style="list-style-type: none"> In a ladder editor, even when some contacts of a function block are not displayed due to changes in the number of the contacts, the undisplayed contacts can be searched for. | |

| Item | Description | Reference |
|---|---|-----------|
| Cross reference | <ul style="list-style-type: none"> An LD element, FBD element, and ST editor for which a constant value is defined are supported. | — |
| Writing data to a programmable controller | <p>When "Not use" is selected for the following system parameter, a multiple CPU system is regarded as the same configuration as a single CPU system; therefore, a project can be written to the CPU No.1 in the multiple CPU system.</p> <ul style="list-style-type: none"> "Multiple CPU Setting" ⇒ "Communication Setting between CPU" ⇒ "Fixed Scan Communication Function" | |
| Rebuild all (reassignment) | <ul style="list-style-type: none"> When information on a structure member of a structure type label cannot be acquired properly, a conversion error (0x12121061) is displayed in the "Output" window and the conversion of all programs is canceled. | |
| Monitoring (Ladder editor) | <ul style="list-style-type: none"> Visibility of the ON/OFF status of a close contact, rising pulse, and falling pulse is enhanced. | |
| Monitoring (Ladder editor, ST editor) | <ul style="list-style-type: none"> While monitoring a program of a function, "---" is displayed as a monitor value of a local label with an indefinite value. | |
| Event history | <ul style="list-style-type: none"> Modify value events that are output from RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU) and RnENCPU can be checked in the "Event History" screen and the "Event History (Offline Monitor)" window. | |
| CC-Link IE TSN/CC-Link IE Field Network diagnostics*4 | <p>The following modules can be diagnosed in a project for an RnSFCPU:*3</p> <ul style="list-style-type: none"> CC-Link IE TSN module CC-Link IE TSN compatible motion modules Servo amplifiers (MR-J5-G, MR-J5W2-G, MR-J5W3-G, MR-J5-G-RJ) <p>The following modules can be diagnosed in projects for an RnCPU, an RnENCPU, and an RnSFCPU:*3</p> <ul style="list-style-type: none"> DC safety input/transistor safety output combined module (NZ2GNSS2-16DTE) DC Safety input module (NZ2GNSS2-8D) Transistor safety output module (NZ2GNSS2-8TE) <p>The following modules can be diagnosed:</p> <ul style="list-style-type: none"> DC input/transistor output combined module (NZ2GNCE3-32DT) DC input modules (NZ2GNCE3-32D, NZ2GNCF1-32D) Transistor output module (NZ2GNCF1-32T) Inverter (FR-E800-SCE) <p>The following statuses are displayed when diagnosing a CC-Link IE TSN module:</p> <ul style="list-style-type: none"> Network synchronous communication status Connection order undefined status <ul style="list-style-type: none"> When diagnosing a CC-Link IE TSN module, information such as the model name of a device station, IP address, and firmware version can be checked in a list by clicking the [Station Information List] button. <p>A CC-Link IE TSN module in which the following parameter is set can be diagnosed:</p> <ul style="list-style-type: none"> "Basic Settings" ⇒ "Network Topology" ⇒ "Ring" <p>A mode set in the following parameter is displayed when diagnosing a CC-Link IE TSN module or CC-Link IE TSN compatible motion module:</p> <ul style="list-style-type: none"> "Application Settings" ⇒ "Communication Mode" ⇒ "Communication Mode" <ul style="list-style-type: none"> The error history of an extension module can be checked when diagnosing a CC-Link IE TSN module. | |
| Options | <p>The following options are added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "ST Editor" ⇒ "Edit Operation" ⇒ "Vertically Align Arguments for Displaying Template" "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "FBD/LD Element" ⇒ "Element Connection" ⇒ "Connect element automatically" | |
| Operating environment (operating system) | <ul style="list-style-type: none"> Windows XP® and Windows Vista® are no longer supported. | |
| Others*4 | <ul style="list-style-type: none"> MELSOFT Update Manager is supported. If a data logging file is stored in the function memory, up to 10 settings of data logging can be performed at the same time by using the data logging function of an RnCPU and RnENCPU. The remote device test of a CC-Link IE TSN module is available. <p>The following functions of a laser displacement sensor control module are available:</p> <ul style="list-style-type: none"> Logging Median filter | |

| Item | Description | Reference |
|---|--|--|
| CC-Link IE TSN configuration window (FX5UCPU, FX5UCCPU) | <ul style="list-style-type: none"> A CC-Link IE TSN system can be configured using this window. | Page 217 Setting network configuration and target devices |
| | <ul style="list-style-type: none"> Parameters of a device station on CC-Link IE TSN can be written to, read from, or deleted from a CPU module or the SD memory card inserted in the CPU module.*^{3,*4} When writing parameters of a device station on CC-Link IE TSN to a CPU module or an SD memory card inserted in the CPU module, the parameters are automatically set to the device station.*^{3,*4} | Page 599 Data to be written and writing destinations Page 604 Parameters of a remote I/O module (device station) on CC-Link IE TSN Page 610 Parameters of a remote I/O module (device station) on CC-Link IE TSN |
| | The following functions are available for CC-Link IE TSN supported devices:* ^{3,*4} <ul style="list-style-type: none"> Connected/disconnected module detection Parameter of device station Command execution of device station | — |
| | A mode set in the following parameter of a CC-Link IE TSN module is displayed: <ul style="list-style-type: none"> "Application Settings" ⇒ "Module Operation Mode" "Application Settings" ⇒ "Communication Mode" ⇒ "Communication Mode" | |
| | A device station can be replaced with a general CC-Link IE TSN module and vice versa by selecting the following menu: <ul style="list-style-type: none"> [CC-Link IE TSN Configuration] ⇒ [Change Module] ⇒ [Replace General CC-Link IE TSN module]/[Change to General CC-Link IE TSN module] The "Device No. Reassignment" screen appears by selecting the following menu. In this screen, device numbers can sequentially be assigned to the link devices on a device station. <ul style="list-style-type: none"> [CC-Link IE TSN Configuration] ⇒ [Device No. Reassignment] | |
| Verification (FX5UCPU, FX5UCCPU) | <ul style="list-style-type: none"> Module parameters of a CC-Link IE TSN module can be verified. | Page 152 Module extended parameters |
| Opening a GX Works2 format project (FX5UJCPU) | <ul style="list-style-type: none"> A project for an FXCPU (FX3U, FX3UC, FX3G, and FX3GC) can be replaced with a project for an FX5UJCPU. | Page 110 Opening a GX Works2 format project |
| Simulation (FX5UCPU, FX5UCCPU) | A project including either of the following modules can be simulated. (The system simulation is not available.) <ul style="list-style-type: none"> Safety extension modules (FX5-SF-8DI4, FX5-SF-MU4T5) | Page 994 Modules supported by GX Simulator3 Page 1012 CPU module (FX5CPU) |
| Simulation (FX5UJCPU) | <ul style="list-style-type: none"> A project for an FX5UJCPU can be simulated. | Page 1024 FX5CPU |
| CC-Link IE TSN/CC-Link IE Field Network diagnostics* ^{3,*4} (FX5UCPU, FX5UCCPU) | <ul style="list-style-type: none"> A CC-Link IE TSN module can be diagnosed. | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |

Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|------------------|---------------------|--|--|--|
| System parameter | RnCPU RnENCPU | CC-Link IE TSN module (RJ71GN11-T2) | "Inter-module Synchronization Setting" ⇨ "Select Inter-module Synchronization Target Module" | Newly added |
| | | | "Inter-module Synchronization Setting" ⇨ "Inter-module Synchronization Master Setting" | Newly added |
| CPU parameter | RnCPU RnENCPU | | "Memory/Device Setting" ⇨ "Buffer Area Setting for Data Sampling" | Newly added |
| | RnSFCPU | | "RAS Setting" ⇨ "LED Display Setting" ⇨ "FUNCTION LED" ⇨ "Function to use FUNCTION LED" | "Memory Dump Function" can be selected. |
| | | | "Memory/Device Setting" ⇨ "Link Direct Device Setting" | Newly added |
| | | | "Memory/Device Setting" ⇨ "Internal Buffer Capacity Setting" ⇨ "Total Capacity" ⇨ "Memory Dump Function" | Newly added |
| | RnPSFCPU | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Cassette Setting" ⇨ "Extended SRAM Cassette Setting" | "2MB" can be selected. |
| | FX5UCPU FX5UCCPU | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Capacity Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "<Detailed Setting>" | In the "Device/Label Memory Area Setting" screen, up to 63 K words can be set for the capacity of "Standard Area." |
| Module parameter | RnCPU RnENCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | The following options can be selected for "Communication Destination": <ul style="list-style-type: none"> • MELSEC-Q (Ethernet module) • MELSEC-L (Ethernet module) • MELSEC-A/AnS (Ethernet Module) • MELSEC-FX3 (Ethernet Block/Adapter) |
| | FX5UCPU FX5UCCPU | | "Application Settings" ⇨ "FTP Client Settings" | Newly added |
| | | | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | The following options can be selected for "Communication Destination": <ul style="list-style-type: none"> • MELSEC iQ-R (built-in Ethernet) • MELSEC-Q (built-in Ethernet) • MELSEC-L (built-in Ethernet) • MELSEC iQ-L (built-in Ethernet) • MELSEC-FX3 (Ethernet Block/Adapter) • OMRON (CJ/CP series) • KEYENCE (KV series) • Panasonic (FP7 series) • MODBUS/TCP-compatible device • SIEMENS S7 series • Panasonic (FP0H series) |
| | All CPUs | Temperature input modules (R60RD8-G, Q64TDV-GH, L60RD8) | — | The following menu is available: <ul style="list-style-type: none"> • [Edit] ⇨ [Channel Copy] |
| | | Temperature control modules (R60TCTRT2TT2, R60TCTRT2TT2BW, Q64TCTTBWN, L60TCTT4, FX5-4LC) | | |
| | RCPU | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | "Options (Hexadecimal)" is added in the "Communication Destination Setting" screen. |

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|---------------------------|---------------------------------------|--|--|--|
| Module parameter | RnCPU RnENCPU RnPCPU RnSFCPU | Serial communication modules (RJ71C24, RJ71C24-R2, RJ71C24-R4) | "MODBUS slave setting" ⇨ "MODBUS device allocation parameter(common)" ⇨ "CC-Link IEF Remote Head Module" ⇨ "Access target" | Newly added |
| | | High speed data logger module (RD81DL96) | "Basic Settings" ⇨ "Various Operations Settings" ⇨ "Mode Settings" | "Firmware update" and "Module Initialization Setting" can be selected. |
| | | OPC UA server module (RD81OPC96) | "Basic Settings" ⇨ "Various Operations Settings" ⇨ "Mode Settings" | "Firmware update" and "Module Initialization Setting" can be selected. |
| | RnCPU RnENCPU | CC-Link IE TSN module (RJ71GN11-T2) | "Basic Settings" ⇨ "Network Topology" | "Ring" can be selected. |
| | | CC-Link IE TSN compatible motion modules (RD78GHV, RD78GHW) | "Basic Settings" ⇨ "Network Topology" | "Ring" can be selected. |
| | | | "Application Settings" ⇨ "Communication Speed" | Newly added |
| | RnSFCPU | CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW) | "Basic Settings" ⇨ "Safety Communication Setting" (for a safety project only) | Newly added |
| | | Ethernet interface modules (_RJ71EN71(CCIEC), _RJ71EN71(E+IEC), RJ71EN71(CCIEC), RJ71EN71(E+CCIEC), RJ71GP21-SX(R), RJ71GP21S-SX(R)) | "Application Settings" ⇨ "Link points extended setting" | Newly added |
| | FX5UCPU FX5UCCPU | CC-Link system master/intelligent device module (FX5-CCL-MS) | "Required Settings" ⇨ "Parameter Setting Method" ⇨ "Setting Method of Basic/Application Settings" | "Program" can be selected. |
| Module extended parameter | RnCPU RnENCPU RnPCPU RnSFCPU | Serial communication modules (RJ71C24, RJ71C24-R2, RJ71C24-R4) | "Simple CPU Communication Setting" | Newly added |
| Memory card parameter | RnSFCPU | | "Setting of File/Data Use or Not in Memory Card" ⇨ "Device Station Parameter" | Newly added |





Version 1.070Y

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|--|--|---|---|
| Copying and pasting | All CPUs | <ul style="list-style-type: none"> When copying and pasting a program block including a module FB to another project, the module FB is automatically added to the project. | Page 134 Module FB |
| Opening a GX Works2 format project | RnCPU RnPCPU | <ul style="list-style-type: none"> Module parameters of an analog module (Q66AD-DG) can be imported as that of a channel isolated analog-digital converter module (R60AD6-DG(Q)). | — |
| | RnPCPU (redundant mode) | <ul style="list-style-type: none"> A redundant type extension base unit (Q65WRB) can be replaced with a redundant extension base unit (R68WRB). | |
| | RnCPU RnENCPU RnPCPU RnPSFCPU | <ul style="list-style-type: none"> A power supply module (Q64RPN) can be replaced with a power supply module (R64RP). | |
| | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> An SFC program can be imported. | |
| Verification | All CPUs | <ul style="list-style-type: none"> When the verification results of a ladder program and ST program are displayed, mismatched data can be merged into a verification source program. | Page 164 Merging mismatched data into a verification source |
| | | <ul style="list-style-type: none"> Label comments for an array element and bit-specified label can be verified. | Page 167 Label comment for an array element or bit-specified label |
| Redundant system configuration ^{*4} | RnPCPU (redundant mode) | <ul style="list-style-type: none"> A redundant extension base unit (R68WRB) is available. | Page 205 Display for a redundant extension base unit configuration Page 604 Writing of module extended parameters in a redundant system configuration |
| Adding a new module | All CPUs | <ul style="list-style-type: none"> A module can be searched for in the "Add New Module" screen. | Page 214 Adding a module |
| AnyWireASLINK configuration window | All CPUs | The following iQ Sensor Solution function is available: <ul style="list-style-type: none"> Verification of connected devices and configurations | Page 218 iQ Sensor Solution functions |
| | | <ul style="list-style-type: none"> Settings can be saved even if a remote module is not placed. | — |
| Label editor | All CPUs | The "Label Comment" window appears by either of the following operations: <ul style="list-style-type: none"> Right-click a cell and select [Open Label Comment Setting] from the shortcut menu. Press the [Alt] + [Enter] keys. | Page 235 Configuration of a label editor |
| | | <ul style="list-style-type: none"> If a label comment is set for an array element or bit-specified label, a red square is displayed at the upper right of the cell. | |
| | | <ul style="list-style-type: none"> Label comments for array elements and bit-specified labels can be exported to an XML file. | Page 255 Exporting/importing a label |
| Structure definition | All CPUs | <ul style="list-style-type: none"> Structure definitions can be exported to an XML file. | Page 252 Exporting/importing structure definitions to/from a file |
| Label comment window | All CPUs | A label comment can be set for the following data in this window: <ul style="list-style-type: none"> Label Array type label Bit-specified label Structure type label Structure member | Page 62 Basic menus Page 77 Available menus when displaying a label editor Page 253 Setting a label comment Page 266 Registering labels in system label database |
| Tag FB setting editor | RnPCPU RnPSFCPU | <ul style="list-style-type: none"> The versions of tag data and a process control function block used in a project can be checked whether they are supported in GX Works3 where the project is open. | Page 260 Registering Tag FBs |
| Creating a program ^{*3} Creating a library Program check Conversion Search/replacement Cross reference | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> Sequential Function Chart language is supported. | Page 270 Programming Function Page 353 Creating an SFC Program Page 934 FX5CPUs |
| Creating a program | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> Step relays (S) can be index-modified. (Excluding the ones used for a contact and coil) | — |

A


| Item | Module type | Description | Reference |
|--|-------------|---|--|
| Ladder editor ST editor FBD/LD editor SFC diagram editor (transition/action) | All CPUs | <p>Label comments for a structure and its member can be displayed together by setting the following option to "In Order of Instance -> Member" or "In Order of Member -> Instance":</p> <ul style="list-style-type: none"> • "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Hierarchy Display Setting for Structures Comment" <p>Label comments of the following data are displayed in each editor. (In an ST editor, they are displayed on the tooltip when selecting a range of each data.)</p> <ul style="list-style-type: none"> • Array element of an array type label • Bit-specified label • Structure member | <p>Page 276 Configuration of a ladder editor</p> <p>Page 320 Configuration of an ST editor</p> <p>Page 333 FBD element</p> |

| Item | Module type | Description | Reference |
|--------------------------------|-------------|--|---|
| Ladder editor | All CPUs | A column width can be changed in the "Column Width" screen that appears by the following operation: • Select and right-click a column, then select [Column Width] from the shortcut menu. | Page 276 Configuration of a ladder editor |
| | | By setting the following option to "Set to Optimized Width," a column width can be adjusted to the optimal width according to the elements within the range displayed in an editor when double-clicking the column header border: • "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Operation in adjusting column width by mouse" | |
| | | • A function block can be inserted by entering its FB instance name in the element entry dialog. | Page 284 Inserting a function block |
| | | • Options of FB instances are displayed by entering 'fb.' in the element entry dialog. | Page 290 Inserting a function |
| | | By selecting "Yes" for the following option, a column width is automatically adjusted so that the text of an input/output label (argument) does not get cut when inserting a function block and function: • "Program Editor" ⇒ "Ladder Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Automatically adjust column width in creating" | |
| | | A label can be registered in the last row of a label editor by selecting the checkbox of the following item in the "Continuous Paste" screen: • Register a label at the last row. | Page 302 Pasting device numbers or label names consecutively |
| | | • The size of the "Line Statement List" screen can be changed. | Page 297 Displaying a list |
| | | The range selected in a ladder editor can be copied to the clipboard as an image by using the following menu: • [Edit] ⇒ [Image Clip] | Page 69 Available menus when editing a ladder program Page 307 Copying an image to the clipboard |
| | | • When changing a column width by dragging the mouse cursor, the width is displayed on the tooltip. | — |
| | | • Options of FB instances are displayed when entering an FB instance name in the "FB Instance Name" screen or changing an FB instance name. | |
| | | An FB instance can be registered in the last row of a label editor by selecting the checkbox of the following item in the "FB Instance Name" screen: • Register a FB instance at the last row. | |
| | | • Label comments of the following data are displayed in the "Enter Ladder" screen with description and in the "Continuous Paste" screen: array element of an array type label, bit-specified label, and structure member. | |
| | | Label comments of the following data can be edited directly: • Array element of an array type label • Bit-specified label • Structure member | |
| | | • Visibility of vertical lines connected to an instruction (except for contact and coil), inline structured text box, and note is improved. | |
| | | • The cursor moves to the previous/next row by pressing the  +  /  keys from the edge of a grid toward the outside. In addition, the range from a point where the  key was first pressed to one where the cursor moved to is selected. | |
| | | • When a column is inserted or deleted in a ladder that is rectangularly selected (excluding a wrapped ladder), a column is added or deleted in each row. | |
| | | • The background color set in "Normal Background" of the "Color and Font" screen is applied to that of the outside of the grid; therefore, the background color of the inside and outside of the grid is unified. | |
| Registering an undefined label | All CPUs | A label can be registered in the last row of a label editor by selecting the checkbox of the following item in the "Undefined Label Registration" screen: • Register a label at the last row. | |

| Item | Module type | Description | Reference |
|-------------------------------------|--------------------|--|---|
| FBD/LD editor SFC diagram editor | All CPUs | <ul style="list-style-type: none"> A connection line can be adjusted manually. (In an SFC diagram editor, only the connection line of an FBD/LD element can be adjusted.) | Page 339 Common operations of elements |
| | | A device comment is displayed with the number of characters set in the following option: <ul style="list-style-type: none"> "Other Editor" ⇒ "Device Comment Editor" ⇒ "Number of Editing/Displaying Characters" ⇒ "Number of Device Comment Editing/Displaying Characters" | — |
| SFC diagram editor | All CPUs | Actions can be hidden by selecting the following menu: <ul style="list-style-type: none"> [View] ⇒ [Hide Actions] An SFC diagram editor becomes read-only when actions are hidden. | Page 74 Available menus when editing an SFC program (SFC diagram) |
| | | Actions can be hidden by selecting "Yes" for the following option: <ul style="list-style-type: none"> "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Display Format" ⇒ "Hide Actions" An SFC diagram editor becomes read-only when actions are hidden. | Page 354 Configuration of an SFC diagram editor |
| | | <ul style="list-style-type: none"> The file size of a project can be reduced by changing the display format of a transition (Zoom) created in Ladder Diagram language. | Page 359 Changing the display format (type) of a transition |
| | | <ul style="list-style-type: none"> "Enter Device/Label Comment Continuously" is added in the property screen for an action/transition in MELSAP-L (instruction format). | Page 382 Creating Zooms (MELSAP-L (instruction format)) |
| | | <ul style="list-style-type: none"> Comments of a device and label used in an action/transition in MELSAP-L (instruction format) can be edited in the "Edit Device/Label Comment" screen. | Page 383 Editing a device comment and label comment |
| Conversion | All CPUs | The following option name is changed. <ul style="list-style-type: none"> Before change (version 1.030G to 1.066U) Language Used by Instruction Conversion of String Operation After change (version 1.070Y) Language for Instruction Conversion of Character String Operation and Label Initial Value | Page 442 Converting character codes |
| Search/replacement | All CPUs | <ul style="list-style-type: none"> Label comments for an array element and bit-specified label can be searched for. | Page 466 Searching for/Replacing Character Strings |
| FB property page | RnPCPU RnPSFCPU | <ul style="list-style-type: none"> Settings for FB properties are categorized in this screen; entered content can be checked, and settings for a function generator can be checked with a graph. | Page 389 Displaying the FB property page |
| Data flow analysis | All CPUs | <ul style="list-style-type: none"> An index-modified device is analyzed with the device value to which the index value is applied. | Page 488 Analysis of an index-modified device |
| | | <ul style="list-style-type: none"> The monitor value of an analyzed device/label can be displayed in the "Dataflow Analysis" window. | Page 496 Monitoring devices/labels |
| | | A comment specified in the following option is displayed in a device/label block or process block: <ul style="list-style-type: none"> "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Hierarchy Display Setting for Structures Comment" | Page 481 Displaying and editing comments |
| Bookmark | All CPUs | <ul style="list-style-type: none"> Position information of a program can be registered as a bookmark from a program editor and the "Dataflow Analysis" window. | Page 500 Registering a Bookmark |
| Library | All CPUs | <ul style="list-style-type: none"> A safety FB library is automatically registered in GX Works3 when installing GX Works3 for the first time. | Page 536 Enhanced Use of Application Library/MELSOFT Library |

| Item | Module type | Description | Reference |
|--|--|--|--|
| Simulation | All CPUs | By selecting "Yes" for the following option, parameters, programs, and optional data are automatically written to GX Simulator3 when simulation is started: • "Simulation" ⇒ "Start Simulation" ⇒ "Operational Setting" ⇒ "Automatically write programs and parameters when starting simulation." | Page 542 Starting a simulation |
| | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU | A project including the following module can be simulated: • Recorder module (RD81RC96) | Page 994 Modules supported by GX Simulator3 Page 1028 Module buffer memory |
| | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnPCPU | A project including the following module can be simulated: • MELSECNET/H network modules (RJ71LP21-25, RJ71LP21-25(R)) | Page 1030 Link devices of network module |
| | RnCPU RnENCPU | The following function is available: • Saving of device/label data write operation histories of the event history function | MELSEC iQ-R CPU Module User's Manual (Application) |
| | RnPCPU | The following function is available: • FB hierarchy information | |
| | RnSFCPU | The following functions are available: • Memory dump • Extension of points for CC-Link IE Controller Network | |
| | RnSFCPU | The following CPU parameters are available: • FUNCTION LED in LED Display Setting | |
| | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU | • The function memory capacity that is used for simulating a project for any of the following CPU modules is increased: RnCPUs (R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU) and RnENCPU. (Total capacity: 20480 KB, capacity for each file size: 8192 bytes) | |
| | RnSFCPU | • An RnSFCPU project including a CC-Link IE TSN module or CC-Link IE TSN compatible motion module can be simulated. | |
| | RnCPU RnENCPU | • If a data logging file is stored in the function memory, up to 10 settings of data logging can be performed at the same time by using the data logging function of an RnCPU and RnENCPU. | — |
| | FX5UCPU FX5UCCPU | A project including either of the following modules can be simulated. (The system simulation is not available.) • CC-Link IE TSN module (FX5-CCLGN-MS) • CC-Link system master/intelligent device module (FX5-CCL-MS) | Page 994 Modules supported by GX Simulator3 |
| | | A project can be simulated while the following option is selected in "Communication Destination" in "Simple CPU Communication Setting" of the module parameters: • MELSEC iQ-R (built-in Ethernet) • MELSEC iQ-L (built-in Ethernet) | Page 1012 CPU module (FX5CPU) Page 1025 Module parameter (Ethernet port) |
| | | The following instructions are available: • Reading/writing data instructions (SP.FREAD, SP.FWRITE) | Page 1017 Application instruction |
| | | • When using the data logging function, data can be saved as a CSV file. | MELSEC iQ-F FX5 User's Manual (Application) |
| | | • In the "Device/Label Memory Area Setting" screen which appears by clicking "Detailed Setting" in "Device/Label Memory Area Setting" of CPU parameter, up to 63 K words can be set for the capacity of "Standard Area." | — |
| Reading data from a programmable controller | All CPUs | • When reading only device memories with a device memory editor opened, the device memory editor remains open during and after the processing. | |
| Writing data to a programmable controller Reading data from a programmable controller Deleting data in a programmable controller | FX5UCPU FX5UCCPU | The following data can be written, read, and deleted: • SFC program • Content of "SFC Setting" in CPU parameters | Page 605 Operations after writing SFC programs Page 606 Setting write target devices and their ranges |
| Device/buffer memory batch monitor | All CPUs | • The "Display Format" screen appears by clicking the [Open Display Format] button. | Page 654 Checking Device/Buffer Memory in a Batch |
| | | • When zooming this screen in and out, the column width is automatically adjusted according to the text size. | — |

| Item | Module type | Description | Reference |
|---|---|--|---|
| Watch | All CPUs | <ul style="list-style-type: none"> When registering a label for which a value other than a fixed value is used as an array index, the index can be extracted and automatically registered as another watch item. | Page 662 Registering an array index |
| | | <ul style="list-style-type: none"> When registering the arguments of an application instruction in a watch window, the arguments are registered according to their data types. | — |
| | | Label comments of the following data are displayed in a watch window: <ul style="list-style-type: none"> Array element of an array type label Bit-specified label Structure member | |
| | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> The current value of a device/label used in an SFC program can be checked. | |
| Intelligent function module monitor | All CPUs | <ul style="list-style-type: none"> A device station can be monitored in a project in which a CC-Link IE TSN module (RJ71GN11-T2) is used. | Page 681 Registration of a device station |
| System monitor | RnPCPU (redundant mode) | <ul style="list-style-type: none"> This function is available in a redundant system configuration in which a redundant extension base unit (R68WRB) is used. | Page 728 Redundant system configuration |
| | RnPCPU RnPSFCPU | <ul style="list-style-type: none"> A trucking cable is no longer displayed in the base configuration when diagnosing an RnPCPU or RnPSFCPU. | |
| Recording monitor ^{*3} | RnSFCPU | <ul style="list-style-type: none"> The recording status can be monitored in a project for an RnSFCPU. | Page 732 Recording Status Check |
| Recording ^{*3} | RnSFCPU | <ul style="list-style-type: none"> This function is available in a project for an RnSFCPU. | Page 759 Recording Function |
| | All CPUs | <ul style="list-style-type: none"> A recording file can be saved in a file server. | |
| | | <ul style="list-style-type: none"> "Sampling Time(Approx.)" is displayed in the "Recording Setting" screen. | |
| Event history (Offline monitor) | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> Events in an event history can be refined. | Page 779 Checking an event history (offline monitor) |
| Offline monitor ^{*3*4} | RnSFCPU | <ul style="list-style-type: none"> Data collected from an RnSFCPU can be monitored by using the recording function of a recorder module. | Page 769 Checking a recording file |
| | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | The following functions are available for a log marker: <ul style="list-style-type: none"> Adding a comment Changing a marker color | Page 777 Editing a comment/color |
| | | <ul style="list-style-type: none"> Log markers are automatically synchronized with GX LogViewer in which data is being displayed in a waveform. | Page 778 Linking with GX LogViewer |
| | | GX VideoViewer can be started by selecting the following menu: <ul style="list-style-type: none"> [Tool] ⇄ [GX VideoViewer] | Page 786 Playing a video |
| | | <ul style="list-style-type: none"> Index registers (Z) and long index registers (LZ) can be monitored regardless of the option setting in the "Recording File Reading" screen. | — |
| | | | |
| Changing the module type/operation mode | FX5UCPU FX5UCCPU | The following data can be utilized when changing the module type from an FX5CPU to an RCPU: <ul style="list-style-type: none"> SFC program Number of step relay (S) points that is set in "Memory/Device Setting" of the CPU parameter Content of "SFC Setting" in CPU parameters | Page 990 Data to be changed when changing the module type |


| Item | Module type | Description | Reference |
|--|-------------------------|--|-----------|
| Options | All CPUs | <p>The following options are added:</p> <ul style="list-style-type: none"> • "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Operation in adjusting column width by mouse" • "Program Editor" ⇒ "Ladder Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Automatically adjust column width in creating" • "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Display Format" ⇒ "Hide Actions" • "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Enter label comment and device comment continuously" • "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Hierarchy Display Setting for Structures Comment" • "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Intelligent Function Module takes priority to be selected for module extension parameter" • "Online" ⇒ "Write to PLC"/"Verify with PLC" ⇒ "Operational Setting" ⇒ "Show only the device memory start with the specified name" • "Online" ⇒ "Write to PLC"/"Verify with PLC" ⇒ "Operational Setting" ⇒ "Show only the file register start with the specified name" • "Simulation" ⇒ "Start Simulation" ⇒ "Operational Setting" ⇒ "Automatically write programs and parameters when starting simulation." | — |
| | FX5UCPU FX5UCCPU | <p>The following options are added:</p> <ul style="list-style-type: none"> • "Program Editor" ⇒ "SFC Diagram Editor" • "Monitor" ⇒ "SFC Diagram Editor" | |
| Printing | FX5UCPU FX5UCCPU | <p>The following data can be printed:</p> <ul style="list-style-type: none"> • SFC program • Content of "SFC Setting" in CPU parameters | |
| FBD/LD editor | All CPUs | <ul style="list-style-type: none"> • When the data type of a function block element is changed, the data type of its FB instance is changed as well as the data type of a function block element with the same FB instance. • When the data name of a function or function block is changed in the navigation window, the data type of a function element or function block element used in this editor is also changed. | |
| Device comment editor | All CPUs | <ul style="list-style-type: none"> • The cursor no longer moves to the "Device Name" column by pressing the  key while editing a device comment. | |
| Cross reference | All CPUs | <ul style="list-style-type: none"> • The "Label Comment" window appears by selecting and right-clicking a row in the search result then selecting [Comment Edit] from the shortcut menu. | |
| Writing data to an SD memory card | All CPUs | <ul style="list-style-type: none"> • Data written to an SD memory card can be transferred to a CPU module by using a boot operation function. | |
| Monitoring | FX5UCPU FX5UCCPU | <p>The following monitor functions are available:</p> <ul style="list-style-type: none"> • SFC diagram monitor • SFC auto-scroll • Zoom monitor • SFC block list monitor • SFC all blocks batch monitor | |
| CC-Link IE Field Network Basic diagnostics | All CPUs | <p>The following modules can be diagnosed:</p> <ul style="list-style-type: none"> • AC input module (NZ2MF2S2-16A) • Contact output module (NZ2MF2S2-16R) | |
| Sensor/device monitor Ethernet diagnostics CC-Link IE Controller Network diagnostics CC-Link IE TSN/CC-Link IE Field Network diagnostics CC-Link diagnostics | RnPCPU (redundant mode) | <p>The following module and the modules mounted on it can be diagnosed:</p> <ul style="list-style-type: none"> • Redundant extension base unit (R68WRB) | |
| Diagnostics | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> • The cursor can jump to the location in which an error has occurred in an SFC program. | |
| Event history ^{*3} | RnSFCPU | <ul style="list-style-type: none"> • A modify value event that is output from an RnSFCPU can be checked in the "Event History" screen and the "Event History (Offline Monitor)" window. | |

Parameters

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|------------------|-------------------------|---|---|---|
| CPU parameter | RnPCPU (redundant mode) | | "Redundant System Settings" ⇨ "Redundant system with extension base unit" | Newly added |
| | FX5UCPU FX5UCCPU | | "SFC Setting" | Newly added |
| | | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Detailed Setting" ⇨ "Device (high speed) Setting" ⇨ "<Detailed Setting>" | A device range is displayed in the "Latch (1)" or "Latch (2)" column. |
| | | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Detailed Setting" ⇨ "Device (Standard) Setting" ⇨ "<Detailed Setting>" | |
| Module parameter | RnCPU RnENCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | The following item is added: • "Initial Communication Setting" ⇨ "Continue Communicating Until Receiving Response" |
| | All CPUs | Serial communication modules (RJ71C24, RJ71C24-R2, RJ71C24-R4, LJ71C24, LJ71C24-R4) | — | The following menu is available: • [Edit] ⇨ [Channel Copy] |
| | | Multiple input modules (FX5-8AD, FX5-8AD(FX2N), L60MD4-G) | | |
| | | Energy measuring modules (QE82LG, QE83WH4W, QE84WH) | | |
| | | Loop control module (Q62HLC) | | |
| | RnPCPU (redundant mode) | Ethernet interface modules (RJ71EN71(E+E), RJ71EN71(Q)) | "Application Settings" ⇨ "Redundant System Settings" ⇨ "To Use or Not to Use Redundant System Settings" | Newly added |

Version 1.072A

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|---|---|--|--|
| Redundant system configuration ^{*4} | RnPCPU (redundant mode) | <ul style="list-style-type: none"> A redundant extension base unit (R66WRB-HT) is available. | Page 205 Display for a redundant extension base unit configuration Page 604 Writing of module extended parameters in a redundant system configuration |
| System monitor | RnPCPU (redundant mode) | <ul style="list-style-type: none"> This function is available in a redundant system configuration in which a redundant extension base unit (R66WRB-HT) is used. | Page 728 Redundant system configuration |
| Sensor/device monitor Ethernet diagnostics CC-Link IE Controller Network diagnostics CC-Link IE TSN/CC-Link IE Field Network diagnostics CC-Link diagnostics | RnPCPU (redundant mode) | The following module and the modules mounted on it can be diagnosed: <ul style="list-style-type: none"> Redundant extension base unit (R66WRB-HT) | — |
| Recording monitor ^{*3} | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> The recording status can be monitored in a project in which a camera recorder module is used. | — |
| Recording ^{*3} | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> This function is available in a project in which a camera recorder module is used. | Page 759 Recording Function |
| | | <ul style="list-style-type: none"> In a project in which a recorder module or camera recorder module is used, any device/label can be specified in "Device/Label Sampling Target Setting" of the "Recording Setting" screen. | — |
| Offline monitor ^{*3} | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> Data collected by the recording function of a camera recorder module can be monitored. | Page 769 Checking a recording file |
| | All CPUs (excluding an R00CPU) | <ul style="list-style-type: none"> A recording file and logging file can be played by clicking  (Play) in the "Seek Bar" window. | Page 774 Seek bar |
| | | <ul style="list-style-type: none"> A recording file and logging file that are saved on a network drive can be monitored. | — |
| Label editor | All CPUs | When a device assigned to a global label is deleted automatically due to specific operations (such as changing the data type of the label or adding/deleting/editing a structure member), that can be reported in the "Output" window by selecting "Yes" for the following option: <ul style="list-style-type: none"> "Other Editor" ⇒ "Label Editor Common" ⇒ "Operational Setting" ⇒ "Notify when assigned device is deleted" | Page 245 Assignment (devices/labels) |
| Options | All CPUs | The following option is added: <ul style="list-style-type: none"> "Other Editor" ⇒ "Label Editor Common" ⇒ "Operational Setting" ⇒ "Notify when assigned device is deleted" | — |
| Parameter | RCP | <ul style="list-style-type: none"> The operability of C intelligent function modules (RD55UP06-V and RD55UP12-V) and their parameter descriptions have been improved. | — |

A

Version 1.075D


All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|---|--|--|---|
| Element selection window | All CPUs | <ul style="list-style-type: none"> By selecting a category from the pull-down list of "Display Target" in the [Favorites], [Module], or [Library] tab, elements only in the category can be displayed. | Page 58 Element selection window |
| | | <ul style="list-style-type: none"> An element can be searched for in the [Library] tab. | Page 59 Searching for elements |
| | | <ul style="list-style-type: none"> Elements can be searched for in a batch in the [POU List] tab. | |
| | | <ul style="list-style-type: none"> The definition of a module FB can be added to the navigation window by dragging and dropping the module FB from the [Module] tab onto "FB/FUN" in the navigation window. | Page 524 Adding the definition of a module FB |
| | | <ul style="list-style-type: none"> Program files, FB files, and FUN files can be displayed in the [Library] tab. In addition, they can be utilized in a project by file. | Page 532 Displaying program files/FB files/FUN files |
| Opening a GX Works2 format project | RCP LHCPU | <ul style="list-style-type: none"> Device comments of local devices can be imported. | — |
| | RnCPU RnENCPU RnPCPU LHCPU | <ul style="list-style-type: none"> Special relays/special registers that can be replaced are added. | |
| | LHCPU | <p>The parameters of the following modules can be imported:</p> <ul style="list-style-type: none"> Serial communication modules (LJ71C24, LJ71C24-R2) Multiple input module (L60MD4-G) Analog input modules (L60AD4, L60ADVL8, L60ADIL8, L60AD4-2GH) Analog output modules (L60DA4, L60DAVL8, L60DAIL8) Analog I/O module (L60AD2DA2) Temperature input module (L60RD8) Temperature control modules (L60TCTT4, L60TCTT4BW, L60TCRT4, L60TCRT4BW) Simple motion modules (LD77MS2, LD77MS4, LD77MS16) High-speed counter module (LD62, LD62D) LD75 type positioning modules (LD75P1, LD75P2, LD75P4, LD75D1, LD75D2, LD75D4) Flexible high-speed I/O control module (LD40PD01) Blank cover module (QG60) | Page 111 Data to be changed |
| Opening a GX Developer format project | RnSFCPU | <p>The following items can be imported:</p> <ul style="list-style-type: none"> User-defined FB Structure Global variable Local label | Page 127 Opening a GX Developer format project |
| Help file | All CPUs | <ul style="list-style-type: none"> e-Manual that is created in e-Manual Create can be displayed. | <p>Page 141 Associating data with an e-Manual</p> <p>Page 142 Opening a help file</p> |
| iQ Sensor Solution function | RnCPU RnENCPU RnSFCPU | <ul style="list-style-type: none"> This function is available in a project using a CC-Link IE TSN-AnyWireASLINK bridge module (NZ2AW1GNAL). | Page 218 iQ Sensor Solution functions |
| Simple device communication library | RnCPU RnENCPU RnPCPU (process mode) RnSFCPU | <p>A simple device communication library can be registered in GX Works3 by using the following menu:</p> <ul style="list-style-type: none"> [Tool] ⇒ [Register Simple Device Communication Library] | Page 225 Registering a simple device communication library |
| Assigned device check | RCP LHCPU | <ul style="list-style-type: none"> A global label to which a device is assigned can be checked if the initial value is set for the label. | Page 251 Initial value check |
| Ladder editor | All CPUs | <ul style="list-style-type: none"> The ON/OFF state of a function/function block is displayed during monitoring even if it is closed in an outline display. | Page 641 ON/OFF state display |
| Ladder editor ST editor FBD/LD editor SFC diagram editor | All CPUs | <ul style="list-style-type: none"> When jumping to an element in an editor, the element is displayed in the center of the editor. | — |

| Item | Module type | Description | Reference |
|--|--|---|--|
| FBD/LD editor SFC diagram editor | All CPUs | <ul style="list-style-type: none"> Multiple comment elements can be linked with a single element. | Page 349 Linking a comment element with a single element |
| | | By selecting "Yes" for the following option, content in the "Remark" column that is set for a global label is displayed on its tooltip. <ul style="list-style-type: none"> "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Tool Hint" ⇒ "Display Item in Tool Hint" ⇒ "Label Remark" "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Tool Hint" ⇒ "Display Item in Tool Hint" ⇒ "Label Remark" | — |
| SFC diagram editor | All CPUs | <ul style="list-style-type: none"> The display format of a transition (Zoom) that consists only of one close contact and TRAN can be changed. | Page 359 Changing the display format (type) of a transition |
| | | <ul style="list-style-type: none"> Devices and labels of the close contact type are available when creating a transition to be displayed in the device/label format. | Page 365 Creating a transition |
| | | A selection branch or simultaneous branch can be added by selecting the following menu after selecting an element that links with a comment element. <ul style="list-style-type: none"> [Edit] ⇒ [Insert] ⇒ [Selection Branch Leg]/[Simultaneous Branch Leg] | — |
| Quick search | All CPUs | <ul style="list-style-type: none"> The functions of navigation window can be searched for and displayed. | Page 146 Searching the Navigation Window |
| Device/label search Device/label replacement Instruction search Instruction replacement | All CPUs | <ul style="list-style-type: none"> By selecting "Include the input/output label of FB instance" under "Find Target," the input/output labels of FB instances in a ladder program and FBD/LD program are searched for or replaced. | Page 463 Searching for/Replacing Devices and Labels Page 465 Searching for/Replacing Instructions |
| Cross reference* ⁴ Device list* ⁴ | RnCPU RnENCPU RnPCPU (process mode) RnSFCPU | <ul style="list-style-type: none"> Devices used in "Simple Device Communication Setting" of the module parameter can be searched for. | — |
| | FX5CPU | Devices used in the following module parameter of Ethernet interface modules (FX5-ENET and FX5-ENET/IP) can be searched for. <ul style="list-style-type: none"> Simple CPU Communication Setting | |
| Cross reference | All CPUs | <ul style="list-style-type: none"> By adding a program file name, FB file name, or FUN file name to a label name, the range of the labels to search for can be specified. | Page 474 Specification method for label type and range |
| Cross reference Data flow analysis | All CPUs | <ul style="list-style-type: none"> By entering a label name as 'FB instance name.label name,' a local label of a function block can be searched for and analyzed. | — |
| Data flow analysis* ⁴ | RnCPU RnENCPU RnPCPU (process mode) RnSFCPU | <ul style="list-style-type: none"> "Simple Device Communication Setting" in the module parameters is added to the target range of data flow analysis. | Page 482 Analysis range |
| | All CPUs | <ul style="list-style-type: none"> A device/label selected on a data flow diagram can be displayed in a waveform in GX LogViewer during offline monitoring. | Page 784 Starting GX LogViewer |
| | | <ul style="list-style-type: none"> The monitor value of an FB instance is displayed. | Page 497 Displaying the monitor value of an FB instance |
| | | <ul style="list-style-type: none"> Multiple elements can be selected on a data flow diagram. | Page 485 Selecting multiple elements |
| | | Values in index registers of the following devices are considered. <ul style="list-style-type: none"> Link direct device Module access device CPU buffer memory access device Network number specified device | — |
| Specifying a connection destination | FX5CPU | <ul style="list-style-type: none"> A CPU module can be accessed via Ethernet interface modules (FX5-ENET and FX5-ENET/IP). | Page 584 Accessing via Network (Single Network) |
| Reading/writing the label memory* ³ | RCPU | <ul style="list-style-type: none"> The label memory can be read from/written to a CPU module in the "CPU Memory Operation" screen. | Page 628 Reading/Writing the Label Memory Page 803 Reading/Writing the Label Memory |
| Firmware update* ^{3*4} | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> The firmware of modules can be updated using GX Works3. | Page 806 Firmware Update |

| Item | Module type | Description | Reference |
|---|---|---|--|
| Simulation | RnPCPU (redundant mode) | A project including the following module can be simulated: • Redundant extension base unit (R68WRB) | Page 543 Simulation of an RnPCPU (redundant mode) Page 994 Modules supported by GX Simulator3 |
| | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU | <ul style="list-style-type: none"> • A data logging setting where "Condition specification" is selected for the file switching timing can be used. • A device value can be added to a saved file name for data logging. • A data logging file can be saved in the CSV file format. | IMELSEC iQ-R CPU Module User's Manual (Application) |
| | RnCPU RnENCPU | A project can be simulated while the following item in "Simple CPU Communication Setting" in the module parameters is set: • "Initial Communication Setting" ⇒ "Continue Communicating Until Receiving Response" | — |
| | RnSFCPU | A project including the following module can be simulated: • Recorder module (RD81RC96) The following function is available: • Saving of device/label data write operation histories of the event history function | IMELSEC iQ-R CPU Module User's Manual (Application) |
| | FX5UCPU FX5UCCPU | • The SFC function is available. | Page 1012 CPU module (FX5CPU) IMELSEC iQ-F FX5 User's Manual (Application) |
| | FX5UCPU FX5UCCPU | The following instructions are available: • SFC control instructions • SFC dedicated instructions | Page 1017 Application instruction |
| | FX5UCPU FX5UCCPU | • "SFC Setting" in CPU parameters is available. | Page 1024 CPU parameter |
| Program list monitor ^{*3} | RnCPU RnENCPU RnPCPU | • A desired program can be started and stopped. | Page 677 Checking the Processing Time of a Program Page 678 Starting a program Page 678 Stopping a program |
| Specified program monitor ^{*3} | RnCPU RnENCPU | • Devices/labels after executing a specified program can be monitored. | Page 633 When monitoring devices/labels in a specified program |
| Sensor/device monitor | RnCPU RnENCPU RnSFCPU | This screen can be displayed by the following operation after selecting a CC-Link IE TSN-AnyWireASLINK bridge module (NZ2AW1GNAL) in the "CC-Link IE TSN/CC-Link IE Field Diagnostics" screen: • Right-click the module and select [AnyWireASLINK Sensor/Device Monitor] from the shortcut menu. | Page 731 Checking the status of a sensor/device connected to a bridge module Page 743 Displaying the sensor/device monitor screen |
| PROFIBUS Configuration Tool | RCPU | The following function of PROFIBUS Configuration Tool is available. • Slave specific transfer (To use this function, it is required that Version 1.04E or later of PROFIBUS Configuration Tool has been installed.) | IMELSEC iQ-R PROFIBUS-DP Module User's Manual (Application) |

| Item | Module type | Description | Reference |
|---|----------------------------|---|-----------|
| Ethernet configuration | FX5CPU | <ul style="list-style-type: none"> MELSOFT connection modules and SLMP connection modules can be placed as ones connected to Ethernet interface modules (FX5-ENET and FX5-ENET/IP). | — |
| CC-Link IE TSN configuration | RnCPU RnPCPU RnSFCPU | <ul style="list-style-type: none"> The PDO mapping parameters can be set in a batch if there is any device station for which PDO mapping parameters are not set when checking the system configuration. If the own station is a CC-Link IE TSN compatible motion module, the checkbox in the "Motion Control Station" column of the station list is automatically selected by dragging and dropping a device station from the module list window onto the station list or network configuration. | |
| Tag FB setting editor | RnPCPU RnPSFCPU | Shortcut keys can be set for the following menus: <ul style="list-style-type: none"> [Edit] ⇒ [New Declaration (Before)] [Edit] ⇒ [Delete Row] [Edit] ⇒ [Export Assignment Information Database File] [Edit] ⇒ [FB Property Page] | |
| Label editor | All CPUs | Shortcut keys can be set for the following menus: <ul style="list-style-type: none"> [Edit] ⇒ [New Declaration (Before)] [Edit] ⇒ [Delete Row] | |
| Ladder editor ST editor SFC diagram editor FBD/LD editor Label editor | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> "String [Unicode]" can be set as the data type of a device/label. | |
| FBD/LD program (including a Zoom) | All CPUs | Shortcut keys can be set for the following menus: <ul style="list-style-type: none"> [Edit] ⇒ [Layout] ⇒ [Insert Row] [Edit] ⇒ [Layout] ⇒ [Delete Row] [Edit] ⇒ [Layout] ⇒ [Insert Column(in FBD Network Block)] [Edit] ⇒ [Layout] ⇒ [Delete Column(in FBD Network Block)] [Edit] ⇒ [Layout] ⇒ [Insert Multiple Rows] [Edit] ⇒ [Layout] ⇒ [Delete Multiple Rows] | |
| Module start I/O No. related area ST editor Device memory editor Cross reference Data flow analysis Device/buffer memory batch monitor Watch Device test with execution conditions Interrupt program list monitor | All CPUs | A device comment is displayed with the number of characters set in the following option: <ul style="list-style-type: none"> "Other Editor" ⇒ "Device Comment Editor" ⇒ "Number of Editing/Displaying Characters" ⇒ "Number of Device Comment Editing/Displaying Characters" | |
| Search/replacement | All CPUs | When using the following menu, the jump destination is displayed in the center of a work window. <ul style="list-style-type: none"> [Find/Replace] ⇒ [Previous]/[Next] | |
| CC-Link IE TSN/CC-Link IE Field Network diagnostics ^{*4} | RnCPU FX5CPU | The following modules can be diagnosed: <ul style="list-style-type: none"> Transistor output modules (NZ2GN12A2-16T, NZ2GN12A2-16TE, NZ2GN2B1-16T, NZ2GN2B1-16TE, NZ2GN2S1-16T, NZ2GN2S1-16TE) DC input modules (NZ2GN12A4-16D, NZ2GN12A4-16DE, NZ2GN2B1-16D, NZ2GN2S1-16D) DC input/transistor output combined modules (NZ2GN12A42-16DT, NZ2GN12A42-16DTE) CC-Link IE TSN-AnyWireASLINK bridge module (NZ2AW1GNAL) Servo amplifiers (MR-J5D1-G, MR-J5D2-G, MR-J5D3-G) | |
| Simple CPU communication diagnostics ^{*3*4} | FX5CPU | <ul style="list-style-type: none"> Ethernet interface modules (FX5-ENET and FX5-ENET/IP) can be diagnosed. A diagnostics target module can be specified. | |

| Item | Module type | Description | Reference |
|------------------------------------|---|--|---|
| Options | All CPUs | <p>The following option name is changed.</p> <ul style="list-style-type: none"> Before change (version 1.045X to 1.072A) "Project" ⇒ "User Library" ⇒ "Library Update Check" After change (version 1.075D) "Project" ⇒ "Element Selection" ⇒ "Update Check" | Page 535 Checking for library updates automatically |
| | | <p>The following options are added:</p> <ul style="list-style-type: none"> "Project" ⇒ "Navigation" ⇒ "Operational Setting" ⇒ "Hide Docking Window When ESC Key is Pressed" "Project" ⇒ "Element Selection" ⇒ "Update Check" ⇒ "Automatically check the version of module label, module FB, tag data structured data type, and process control FB." "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Tool Hint" ⇒ "Display Item in Tool Hint" ⇒ "Label Remark" "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Tool Hint" ⇒ "Display Item in Tool Hint" ⇒ "Label Remark" "Parameter" ⇒ "Common Item" ⇒ "Operational Setting" ⇒ "Operation on Double-clicking Pulldown List" "Parameter" ⇒ "Network Configuration Settings" ⇒ "CC-Link IE TSN" ⇒ "Operational Setting" ⇒ "Check the station No. and IP address in closing the window to reflect the setting." | — |
| Printing ^{*4} | RnCPU RnENCPU | <p>The following option is added:</p> <ul style="list-style-type: none"> "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Use Phase Processing Instructions" | |
| | RnPCPU (process mode) RnSFCPU | <ul style="list-style-type: none"> Contents of "Simple Device Communication Setting" in the module parameters can be printed. | |
| | FX5CPU | <p>Contents of the following parameters of Ethernet interface modules (FX5-ENET and FX5-ENET/IP) can be printed:</p> <ul style="list-style-type: none"> BACnet Function Setting Simple CPU Communication Setting | |
| Shortcut key | All CPUs | <ul style="list-style-type: none"> When updating GX Works3, shortcut keys that were set before the update are applied. | |
| Reading/writing/deleting user data | All CPUs | <ul style="list-style-type: none"> A file with the '.QST' extension can be written, read, and deleted. | |
| Offline monitor | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> A recording file including up to 5,232,645 records can be monitored. | |
| Others | All CPUs | <ul style="list-style-type: none"> When installing GX Works3, GX VideoViewer can be installed at the same time. |  GX Works3 Installation Instructions |
| | FX5UJCPU | <p>The following modules can be used in a project:</p> <ul style="list-style-type: none"> Safety extension modules (FX5-SF-8DI4, FX5-SF-MU4T5) | — |

Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|------------------|--|---|--|--|
| System parameter | RnCPU RnENCPU | CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW) | "Inter-module Synchronization Setting" ⇨ "Select Inter-module Synchronization Target Module" | Newly added |
| | | | "Inter-module Synchronization Setting" ⇨ "Inter-module Synchronization Master Setting" | Newly added |
| CPU parameter | RnPCPU | | "Memory/Device Setting" ⇨ "Link Direct Device Setting" | Newly added |
| Module parameter | RnCPU RnENCPU RnPCPU (process mode) RnSFCPU | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇨ "Simple Device Communication Setting" | Newly added |
| | | EtherNet/IP module (RJ71EIP91) | "Basic Setting" ⇨ "EtherNet/IP Configuration Tool" | Newly added |
| | RnSFCPU | CC-Link IE TSN module (RJ71GN11-T2) | "Basic Settings" ⇨ "Safety Communication Setting" ⇨ "<Detailed Setting>" | "CR800-R" can be selected for "Communication Destination." |
| | FX5CPU | Ethernet interface modules (FX5-ENET and FX5-ENET/IP) | "Basic Settings" ⇨ "BACnet Function Setting" | Newly added |
| | | | "Basic Settings" ⇨ "Own Node Settings" ⇨ "Communication Data Code" | Newly added |
| | | | "Application Settings" ⇨ "Simple CPU Communication Setting" | Newly added |
| | | | "Application Settings" ⇨ "Security" ⇨ "Disable Direct Connection with MELSOFT" | Newly added |
| | | | "Application Settings" ⇨ "Security" ⇨ "Do Not Respond to CPU Module Search" | Newly added |

Version 1.077F

All CPUs: RCPU, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|---------------------------|---|---|---|
| Start of GX Works3 | All CPUs | <ul style="list-style-type: none"> The display position and window size of GX Works3 at startup can be specified by specifying an option in a command line. Offline monitoring can be started when starting GX Works3 by specifying an option in a command line. | Page 47 Starting GX Works3 by specifying the display position and window size |
| Creating a function block | All CPUs | <ul style="list-style-type: none"> A function block can be created from a ladder block selected in a ladder editor. | Page 505 Creating a Function Block |
| Reading a recording file | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU), RnENCPU, RnSFCPU | <ul style="list-style-type: none"> Project data saved in a recorder module can be read. | Page 762 Reading a recording file |
| Offline monitor | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> If project data is saved in a recorder module, camera recorder module, or file server, the following project data is automatically opened among the saved project data when starting offline monitoring: project data with the time information closest to the time at which a recording file to be played was saved. | IMELSEC iQ-R System Recorder User's Manual (Application) |
| Options | All CPUs | <p>The following options are added:</p> <ul style="list-style-type: none"> "Monitor" ⇨ "Common Item" ⇨ "Change Current Value" ⇨ "Show a confirmation message when modifying value in Watch." "Convert" ⇨ "Basic Setting" ⇨ "Operational Setting" ⇨ "Function Block" ⇨ "Check the Device Which is Connected to Argument" | — |

Version 1.080J

All CPUs: RCPU, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|--|---------------------|--|--|
| Printing | RCPU LHCPU | <ul style="list-style-type: none"> Inline structured text programs used in an FBD/LD program can be printed. | Page 96 Printing inline structured text programs used in FBD/LD programs |
| | All CPUs | <ul style="list-style-type: none"> File names are displayed in the "Do Not Print" column of "Setting by Item" in the "Print" screen in the same order as the navigation window. | — |
| Verification | RCPU LHCPU | <ul style="list-style-type: none"> Inline structured text programs used in an FBD/LD program can be verified. | Page 159 FBD/LD program Page 164 Merging mismatched data into a verification source Page 166 FBD/LD program |
| Quick search | All CPUs | <ul style="list-style-type: none"> Menus can be searched for in the quick search. | Page 79 Quick Search |
| Opening a GX Works2 format project | FX5CPU | <ul style="list-style-type: none"> A project for an FXCPU (FX3S) can be replaced with a project for an FX5CPU. | Page 110 Opening a GX Works2 format project |
| Opening a PX Developer format project | RCPU | <ul style="list-style-type: none"> Inline ST parts used in a PX Developer project can be imported as an inline structured text program. | Page 114 Data to be changed (PX Developer) Page 960 Inline ST part |
| Opening a GX IEC Developer format project | FX5UCPU FX5UCCPU | <ul style="list-style-type: none"> POUs created in Sequential Function Chart language can be imported. | Page 120 Data to be changed |
| AnyWireASLINK configuration window ^{*5} | RCPU | The following functions are available even when a specific error or alarm occurs in an AnyWireASLINK master module or CC-Link IE Field-AnyWireASLINK bridge module: <ul style="list-style-type: none"> Automatic detection of connected devices Parameter processing of remote module Verification of connected devices and configurations Sensor/device monitor | — |
| | | The following function is available for a CC-Link-AnyWireASLINK bridge module and CC-Link IE Field-AnyWireASLINK bridge module: <ul style="list-style-type: none"> Verification of connected devices and configurations | |
| CC-Link IE TSN configuration window | RCPU | <ul style="list-style-type: none"> The "CC-Link IE TSN Class" column is added. | |
| | | <ul style="list-style-type: none"> The number of device stations that can be placed in this window is changed from 254 to 120 in a project using a CC-Link IE TSN compatible motion module. | |
| Changing a module | RCPU | <ul style="list-style-type: none"> The module names of CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, and RD78GHW only) can be changed. | Page 230 Change Module |
| Navigation window | All CPUs | Program files, program blocks, and worksheets can be sorted by name or update date and time in a batch by either of the following operations: <ul style="list-style-type: none"> Right-click "Project" and select [Sort] ⇒ [Name] from the shortcut menu. Right-click "Project" and select [Sort] ⇒ [Last Change] from the shortcut menu. | Page 55 Sorting data |
| Label comment window | All CPUs | A label can be pasted by dragging and dropping its label name to any of the following screens: <ul style="list-style-type: none"> Ladder editor ST editor FBD/LD editor SFC diagram editor Watch window [Favorites] tab in the element selection window | Page 60 Adding from the "Label Comment" window Page 294 Pasting from each screen Page 661 Registering devices/labels from the "Label Comment" window |
| Creating a program ^{*3} (Standard program) | RnSFCPU | <ul style="list-style-type: none"> Sequential Function Chart language is supported. | — |

| Item | Module type | Description | Reference |
|---|--------------------|--|--|
| Ladder editor | All CPUs | <ul style="list-style-type: none"> A label comment or device comment can be directly edited by double-clicking it. | Page 295 Entering/editing comments |
| | | By selecting "Yes" for the following option, the "FB Instance Name" screen appears when pasting a function block: | — |
| | | <ul style="list-style-type: none"> "Program Editor" ⇒ "Ladder Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Show FB Instance Name Window in Pasting Ladder" | |
| | | <ul style="list-style-type: none"> The "Input Inline Structured Text Title" screen appears by double-clicking the title of an inline structured text. | |
| | | <ul style="list-style-type: none"> Visibility of the vertical lines of parallel circuits is improved in the output circuits of function blocks and functions. In a ladder block in which an FB instance or function is used, arguments which are not entered can be entered consecutively after entering an input, output, or input/output argument. | |
| FBD/LD editor | All CPUs | An argument (input/output label) of a function element/function block element can be hidden by using smart tags or the following menus: <ul style="list-style-type: none"> [Edit] ⇒ [I/O Argument] ⇒ [Mark as Hidden] [Edit] ⇒ [I/O Argument] ⇒ [Hide Argument] | Page 72 Available menus when editing an FBD/LD program Page 166 FBD/LD program Page 342 Hiding arguments |
| | | The height of a function element/function block element can be changed by using the following menus: <ul style="list-style-type: none"> [Edit] ⇒ [Toggle FB/FUN Height] ⇒ [Adapt Width] [Edit] ⇒ [Toggle FB/FUN Height] ⇒ [Keep Width] | Page 72 Available menus when editing an FBD/LD program Page 345 Changing the height of an element |
| | RCPU LHCPU | <ul style="list-style-type: none"> An inline structured text element is available in an FBD/LD program. | Page 72 Available menus when editing an FBD/LD program Page 330 Configuration of an FBD/LD editor Page 340 Inserting an inline structured text element Page 343 Changing the element size |
| | | The colors of inline structured text elements can be changed in the following items in the "Color and Font" screen: <ul style="list-style-type: none"> Data Name of Inline Structured Text Element Text of Inline Structured Text Element Background of Inline Structured Text Element Invalid Definition of FB/FUN/Inline Structured Text | — |
| | | | |
| SFC diagram editor | All CPUs | The color of the following item can be changed in the "Color and Font" screen: <ul style="list-style-type: none"> Background of Jump Symbol | |
| | | <ul style="list-style-type: none"> A step with a jump symbol can be copied without selecting the jump source. | |
| FBD/LD editor SFC diagram editor | All CPUs | <ul style="list-style-type: none"> Visibility of elements and connection lines is improved. | |
| Ladder editor ST editor FBD/LD editor | All CPUs | <ul style="list-style-type: none"> If the definition name of the function block includes any of the following symbols, the symbol is replaced with an underscore (_) in the "Label Name" column of the "Undefined Label Registration" or "FB Instance Name" screen: plus sign (+), minus sign (-), exclamation mark (!), left round bracket ((), right round bracket ()), or backquote (`). | Page 284 Inserting a function block Page 324 Inserting a function block Page 336 Inserting a function block |
| FB property page | RnPCPU RnPSFCPU | <ul style="list-style-type: none"> This function is available for all loop tag FBs. | Page 389 Displaying the FB property page |
| Device search/ replacement Instruction search/ replacement Character string search/ replacement Device batch replacement | RCPU LHCPU | <ul style="list-style-type: none"> Data in an inline structured text program used in an FBD/LD program can be searched for/replaced. | Page 463 Searching for/ Replacing Devices and Labels Page 465 Searching for/ Replacing Instructions Page 466 Searching for/ Replacing Character Strings Page 469 Batch Replacing of Devices and Labels |
| Character string search/ replacement | RCPU LHCPU | <ul style="list-style-type: none"> The data name of an inline structured text box or inline structured text element can be searched for/replaced by entering "@STB" or "@IST." | Page 466 Searching for/ Replacing Character Strings |

| Item | Module type | Description | Reference |
|--------------------|----------------------------|--|--|
| Cross reference | RCPU LHCPU | • Devices/labels in inline structured text programs used in an FBD/LD program can be searched for. | — |
| Data flow analysis | RCPU LHCPU | • Devices/labels in inline structured text programs used in an FBD/LD program can be analyzed. | |
| Bookmark | RCPU LHCPU | • Position information of an inline structured text program that is used in an FBD/LD editor can be registered as a bookmark. | Page 500 Registering a Bookmark |
| Library | All CPUs | • A library using an each program device comment and/or a common device comment can be exported. | Page 527 User libraries |
| Simulation | All CPUs | A project including any of the following modules can be simulated: • Temperature control modules (R60TCTRT2TT2-TS, R60TCRT4-TS) • High speed data communication module (RD81DC96) • Camera recorder module (RD81RC96-CA) • GP-IB interface module (RJ71GB91(M), RJ71GB91(S)) • CC-Link IE TSN compatible motion modules (RD78G4(S), RD78G8(S), RD78G16(S)) • CC-Link IE TSN compatible motion modules (FX5-40SSC-G(S), FX5-80SSC-G(S)) | Page 994 Modules supported by GX Simulator3 Page 999 Modules supported by GX Simulator3 (System simulation) Page 1028 Module buffer memory Page 1030 Link devices of network module |
| | All CPUs | A system including the following modules can be simulated: • CC-Link IE TSN compatible motion modules (RD78G4(S), RD78G8(S), RD78G16(S), FX5-40SSC-G(S), FX5-80SSC-G(S)) • CC-Link IE TSN module (FX5-CCLGN-MS) | Page 556 Simple motion module/motion module Page 558 Network modules |
| | All CPUs | • Multiple systems that perform transient transmission can be simulated. | Page 558 Network modules Page 1032 Network functions Page 1043 Simulation of network modules |
| | All CPUs | The following items are available when simulating network modules. • Application settings in network parameters • Dedicated instructions for network modules | Page 1034 Network parameters Page 1037 Dedicated instructions for network modules |
| | All CPUs | • The current value of a timer, clock function, and system clock operate with the actual time. | Page 1041 Timer, clock function, and system clock |
| | All CPUs | When writing a project to a simulator, the project is automatically saved by selecting "Yes" for the following option: • "Project" ⇒ "Save" ⇒ "Auto-save Operational Setting" ⇒ "Automatically save in writing to Simulator as well" Note that this option can be set only when selecting "Yes" for any of the following options: • "Project" ⇒ "Save" ⇒ "Auto-save Execution Setting" ⇒ "Save project after Write to PLC" • "Project" ⇒ "Save" ⇒ "Auto-save Execution Setting" ⇒ "Save project after Online Program Change" • "Project" ⇒ "Save" ⇒ "Auto-save Execution Setting" ⇒ "Save project after changing TC Setting Value and writing to PLC" | — |
| | RnCPU RnENCPU | The following functions are available: • System monitoring information (SD2000 to SD2036) • Specified program monitor • CC-Link IE TSN motion module inter-module synchronization function | IMELSEC iQ-R CPU Module User's Manual (Application) |
| | | The following instructions are available: • Phase processing instructions | |
| | RnCPU RnENCPU RnPCPU | The following function is available: • Program start/stop • Label memory read/write | |
| | RnPCPU | The following functions are available: • Extension of points for CC-Link IE Controller Network • Laser displacement sensor control module supporting the redundant system with redundant extension base unit • Device/label access service processing constant wait function | |
| | FX5UCPU FX5UCCPU | The following instructions are available: • File operation instructions (SP.FREAD, SP.FWRITE, SP.FDELETE, SP.FCOPY, SP.FMOVE, SP.FRENAME, SP.FSTATUS) • String processing instructions (\$MOV(P)_WS, SJIS2WS(P), SJIS2WSB(P), WS2SJIS(P)) | Page 1017 FX5CPU |

| Item | Module type | Description | Reference |
|---|-----------------------------|---|--|
| Specifying a connection destination ^{*3*4} | RCPU | • A CPU module can be accessed from a personal computer via a GOT and CC-Link IE TSN module. | Page 589 Accessing via a GOT and a module |
| | FX5CPU | • An FX5CPU to be accessed can be changed in the "Network Communication Route Detailed Setting of Ethernet" screen when connecting a personal computer to multiple FX5CPUs via a GOT and Ethernet. | |
| Monitor ^{*3} | RnCPU RnENCPU RnSFCPU | • The maximum and minimum values of scan time can be cleared from the monitor status bar during monitoring. | Page 634 Status monitoring |
| | RCPU LHCPU | • An inline structured text program used in an FBD/LD program can be monitored (only in an ST editor). | Page 643 FBD/LD |
| | RnCPU RnENCPU RnSFCPU | • Whether the IP address change function is used for a network number, station number, and IP address can be checked on the tooltip. | Page 729 Check of the specification method for a network No., station No., and IP address |
| Device/buffer memory batch monitor | All CPUs | • When changing the current value of a device that is not the bit type device, the device is registered in a watch window according to the displayed data type. | — |
| Watch | RCPU LHCPU | • Devices/labels in inline structured text programs used in an FBD/LD program can be registered (only from an ST editor). | Page 661 Registering devices/labels from program editor/label editor Page 663 Automatic registration to watch windows |
| Realtime monitor | RCPU LHCPU | A device/label selected in any of the following screens is automatically registered to the "Realtime Monitor Setting" screen of GX LogViewer: <ul style="list-style-type: none"> • Ladder editor • ST editor • FBD/LD editor • Watch window | Page 683 Procedure for using the realtime monitor |
| Intelligent function module monitor | RCPU | • A CC-Link IE TSN compatible motion module can be registered in the intelligent function module monitor from the navigation window by using a shortcut menu. | Page 681 Registration of an intelligent function module |
| Offline monitor | All CPUs | • While monitoring a recording file or logging file, the values of devices/labels that match specified conditions and their indexes can be checked. | Page 781 Checking a device/label value |
| | All CPUs | The following shortcut menu name is changed: <ul style="list-style-type: none"> • Before change (version 1.035M to 1.077F): Wave Display • After change (version 1.080J): Wave Display (Offline Monitor) | Page 784 Starting GX LogViewer |
| Event history | All CPUs | • When an event code cannot be acquired, the cause is displayed. | — |
| User authentication ^{*3} | RnPSFCPU | • "Assistant Developers" is added to the access level of user. | Page 711 Functions and operations that require user authentication |
| Diagnostics | RCPU LHCPU | • The cursor can jump to an error location in an inline structured text program used in an FBD/LD program. | — |
| Firmware update | FX5SCPU | • The firmware of modules can be updated using GX Works3. | Page 806 Firmware Update |

| Item | Module type | Description | Reference |
|---------|--|--|-------------------------------|
| Options | All CPUs | <p>The following option name is changed.</p> <ul style="list-style-type: none"> Before change (version 1.035M to version 1.077F) "Project" ⇒ "Save" ⇒ "Operational Setting" After change (version 1.080J) "Project" ⇒ "Save" ⇒ "Auto-save Execution Setting" | Page 130 Overwriting projects |
| | All CPUs | <p>The following options are added:</p> <ul style="list-style-type: none"> "Project" ⇒ "Save" ⇒ "Auto-save Operational Setting" ⇒ "Automatically save in writing to Simulator as well" "Program Editor" ⇒ "Ladder Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Show FB Instance Name Window in Pasting Ladder" "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "FB/FUN height" "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "FB/FUN height" "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Show a confirmation message in executing" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "SFC Diagram" ⇒ "Delete Unused Zoom" | — |
| | RCPU LHCPU FX5UCPU FX5UCCPU FX5UJCPU | <p>The following option is added:</p> <ul style="list-style-type: none"> "Intelligent Function Module" ⇒ "Simple Motion" ⇒ "Operational Setting" ⇒ "Select Simple Motion Module Setting as write target" | |
| | FX5CPU | <p>The following options are added:</p> <ul style="list-style-type: none"> "Parameter" ⇒ "Device Setting" ⇒ "Display Setting" ⇒ "Display Device/Label Memory Area Setting as Simple Setting" ⇒ "Free Space for Label/Latch Label Memory Area to Allocate" "Parameter" ⇒ "Device Setting" ⇒ "Display Setting" ⇒ "Display Device/Label Memory Area Setting as Simple Setting" ⇒ "Firmware Version of Target CPU" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check by the Threshold of Free Space for Label/Latch Label in Executing Convert/Rebuild All" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check by the Threshold of Free Space for Label/Latch Label in Executing Convert/Rebuild All" ⇒ "Threshold of Free Space for Label/Latch Label" | |

Parameters

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|----------------------------------|--------------------------------|--|--|---|
| System parameter | RCPU | CC-Link IE TSN compatible motion modules (RD78G4(S), RD78G8(S), or RD78G16(S) only) | "Inter-module Synchronization Setting" ⇨ "Select Inter-module Synchronization Target Module" | Newly added |
| | | | "Inter-module Synchronization Setting" ⇨ "Inter-module Synchronization Master Setting" | Newly added |
| CPU parameter | FX5SCPU FX5UCPU | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Capacity Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "<Detailed Setting>" | The device/label memory area is optimized according to the settings in "Batch Setting" by clicking the [Batch Setting] button in "Device/Label Memory Area Batch Setting" of the "Device/Label Memory Area Setting" screen. |
| | FX5SCPU FX5UCPU FX5UJCPU | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Capacity Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "<Detailed Setting>" | The "Usage Status of Device/Label Memory Area" screen appears by clicking the [Usage Status] button in "Setting Area" of the "Device/Label Memory Area Setting" screen. |
| Module parameter ^{*3*4} | RCPU | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇨ "Simple Device Communication Setting" ⇨ "Communication Destination Setting" ⇨ "<Detailed Setting>" | The following operations can be performed for "Communication Destination Setting": • Selecting "User Selection" for "Setting Method" • Importing/exporting the communication destination settings |
| | FX5UJCPU | | "Application Settings" ⇨ "Web Server Settings" ⇨ "Account Settings" ⇨ "<Detailed Setting>" | "User Web Page Only" and "Permit Both Displays" can be selected in the "Authority for Window Display" column of the "Web Server Account Settings" screen. |
| | All CPUs | CC-Link IE Field Network modules (RJ71GF11-T2(MR), RJ71GF11-T2(LR)) | "Required Settings" ⇨ "Parameter Setting Method" ⇨ "Setting Method of Basic/Application Settings" | "Program" can be selected. |
| | RCPU | CC-Link IE TSN module (RJ71GN11-T2) CC-Link IE TSN compatible motion module | "Basic Settings" ⇨ "Connection Device Information" ⇨ "TSN HUB Setting" | Newly added |
| | | | "Basic Settings" ⇨ "Communication Period Setting" ⇨ "Multiple Period Setting" ⇨ "Low-Speed" | "x32," "x64," and "x128" can be selected. |
| | | CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, and RD78GHW only) | "Refresh Setting" | Newly added |

Version 1.082L

| Item | Module type | Description | Reference |
|---|------------------|---|--|
| Opening a GX Works2 format project | LHCPU | The parameters of the following module can be imported: • AnyWireASLINK interface module (LJ51AW12AL) | Page 111 Data to be changed |
| Device assignment confirmation | RnCPU RnENCPU | • Refresh devices which are assigned to a device station can be checked when using a CC-Link IE TSN Plus master/local module. | Page 219 Checking refresh devices assigned to a module |
| | | • Content in the "Explanation" column displayed in the link device list of the "Device Assignment Confirmation" screen can be applied to the device comment for each refresh device when using a CC-Link IE TSN Plus master/local module. | — |
| Module parameter | RnCPU RnENCPU | • Link side devices of a CC-Link IE TSN Plus master/local module can be set in a batch. | Page 224 Setting link side devices in a batch (CC-Link IE TSN) |
| Reading sample comments | RnCPU RnENCPU | • Sample comments of a CC-Link IE TSN Plus master/local module can be read. | — |
| Scan time measurement ^{*3} | RnCPU RnENCPU | • A scan time can be measured for any sections in a program. | Page 675 Measuring the Scan Time of a Program |
| Remote password ^{*3*4} | RnCPU RnENCPU | • This function is available when accessing a CPU module via a CC-Link IE TSN Plus master/local module. | Page 724 Remote password function |
| CC-Link IE TSN/CC-Link IE Field Network diagnostics ^{*3*4} | RnCPU RnENCPU | • A CC-Link IE TSN Plus master/local module can be diagnosed. | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| Intelligent function module monitor ^{*3*4} | RnCPU RnENCPU | • A device station on CC-Link IE TSN can be monitored in a project in which a CC-Link IE TSN Plus master/local module is used. | — |
| Reading/writing the label memory | RCPU | • This function is available even when a CPU module is in the RUN state. | |

■Parameters

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|------------------|------------------|---|---|-------------|
| System parameter | RnCPU RnENCPU | CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) | "Inter-module Synchronization Setting" ⇄ "Select Inter-module Synchronization Target Module" | Newly added |
| | | | "Inter-module Synchronization Setting" ⇄ "Inter-module Synchronization Master Setting" | Newly added |

Version 1.085P

All CPUs: RCP, LHCP, and FX5CP

| Item | Module type | Description | Reference |
|--|-------------|---|---|
| Operating environment (operating system) | All CPUs | <ul style="list-style-type: none">Windows 11 is supported. | — |
| Navigation window | RCP LHCP | Module information can be sorted by module name or start I/O No. order in a batch by the following operations: <ul style="list-style-type: none">Right-click and select [Sort] ⇒ [Module Name] from the shortcut menu.Right-click and select [Sort] ⇒ [Start I/O No.] from the shortcut menu. | Page 55 Sorting data |
| Element selection window | All CPUs | The following information of a program file of a user library is displayed in the [Library] tab: <ul style="list-style-type: none">Right-side of an element: titleExplanation column of an element: update date and time, comment <ul style="list-style-type: none">When utilizing a program file of a user library, the title and comment of the program file also can be utilized. | — |
| Copying and pasting | All CPUs | <ul style="list-style-type: none">Data can be copied and pasted even if the module types of the copy source and copy destination are different. | Page 135 CPU module type combinations Page 135 When CPU module types are different |
| Verification | All CPUs | <ul style="list-style-type: none">Memory card parameters can be verified. | — |
| Guidance flow | FX5CP | <ul style="list-style-type: none">The setting procedure of parameters can be checked in a flow. | Page 208 Guidance flow function |

| Item | Module type | Description | Reference |
|---|-----------------------------|--|--|
| AnyWireASLINK configuration window Sensor/device monitor | RCPU | The following functions are available even if an ID (address) of a remote module connected to an AnyWireASLINK master module is duplicated: <ul style="list-style-type: none"> Automatic detection of connected devices Parameter processing of remote module Verification of connected devices and configurations Sensor/device monitor | — |
| CC-Link IE TSN configuration window ⁴ | RnCPU RnENCPU RnSFCPU | When the own station is a CC-Link IE TSN module, the following function is available even if data of the master station is not linked: <ul style="list-style-type: none"> Connected/disconnected module detection When "Multicast" is set for the following module parameter for CC-Link IE TSN compatible motion modules, "Online (Multicast Mode)" is displayed for "Mode Settings" in this window. <ul style="list-style-type: none"> "Application Settings" ⇒ "Communication Mode" ⇒ "Communication Mode" <ul style="list-style-type: none"> If the own station is a CC-Link IE TSN compatible motion module, the values in "LB Setting" and "LW Setting" of the own station can be set. If the own station is a CC-Link IE TSN compatible motion module, the values in "RX setting," "RY setting," "RWw setting," and "RWr setting" can be set even when the checkbox in the "Motion Control Station" column of the station list is selected: "Synchronize" can be set for "Network Synchronous Communication" in this window even when the following module parameter of CC-Link IE TSN motion modules (only RD78GHV and RD78GHW) is set to "Ring": <ul style="list-style-type: none"> "Basic Settings" ⇒ "Network Topology" ⇒ "Ring" | |
| | FX5UCPU FX5UCCPU | When setting either of the following modules as the master station, "Authentication Class" can be set for a device station. <ul style="list-style-type: none"> CC-Link IE TSN module (FX5-CCLGN-MS) CC-Link IE TSN compatible motion modules (FX5-40SSC-G(S), FX5-80SSCG(S)) | |
| | | | |
| CC IE Field configuration window | All CPUs | Parameters can be written to or read from multiple device stations in a batch by selecting the following menu: <ul style="list-style-type: none"> [CC IE Field Configuration] ⇒ [Online] ⇒ [The Parameter Processing of Multiple Device Stations] | |
| Ladder editor ST editor FBD/LD editor Label editor | FX5UJCPU | <ul style="list-style-type: none"> "String [Unicode]" can be set as the data type of a device/label. | |
| Label editor | All CPUs | <ul style="list-style-type: none"> When zooming this screen in and out, the column width is automatically adjusted according to the display magnification. | |
| Ladder editor | All CPUs | <ul style="list-style-type: none"> The initial value set in the extension display area of a label editor in which an FB instance is registered is displayed preferentially as the initial value of label of 'VAR_PUBLIC' class or 'VAR_PUBLIC_RETAIN' class in the FB instance. When editing a device/label comment directly, the comment can be fixed by clicking outside the editing range. | |
| ST editor | All CPUs | <ul style="list-style-type: none"> The split can be restored by dragging the splitter bar to the bottom of an ST editor. A row of the cursor position can be moved upward or downward by pressing the [Ctrl] + [Shift] + [↑] / [↓] keys. A screen can be scrolled horizontally by scrolling the mouse wheel while pressing the [Shift] key. Multiple rows can be selected and edited by pressing the [Shift] + [Alt] + [↑] / [↓] keys or dragging the mouse while pressing the [Alt] key. A searched keyword can be highlighted with the incremental search function. | Page 72 Available menus when editing an ST program Page 320 Configuration of an ST editor Page 323 Entering programs Page 327 Editing multiple rows simultaneously Page 328 Incremental search |
| FBD/LD editor | FX5CPU | <ul style="list-style-type: none"> An inline structured text element is available in an FBD/LD program. | Page 340 Inserting an inline structured text element |
| FB property page | RnPCPU RnPSFCPU | This function is available for all the following tag FBs: <ul style="list-style-type: none"> Status tag Alarm tag Message tag | Page 389 Displaying the FB property page |

| Item | Module type | Description | Reference |
|--|---------------------|---|--|
| Simulation | RnCPU RnENCPU | The following function is available: • Scan time clear | IMELSEC iQ-R CPU Module User's Manual (Application) |
| | RnSFCPU | The following functions are available: • Program execution (SFC) • Scan time clear • SFC program (diagram) monitor • SFC-activated step monitor • Online change (SFC block) • Label memory read/write | IMELSEC iQ-R CPU Module User's Manual (Application) |
| | | • SFC control instructions are available. | Page 1015 Application instruction |
| | | • "SFC Setting" in CPU parameters is available. | Page 1019 CPU parameter |
| | RCPU FX5CPU | The following modules can be simulated together: • Simple motion module • Motion CPU • CC-Link IE TSN compatible motion module | Page 999 Modules supported by GX Simulator3 (System simulation) |
| | FX5UCPU FX5UCCPU | The following has been improved: • Processing time of the SP.FMOVE instruction (a file operation instruction) when 0 (File) is specified for the target type setting | IMELSEC iQ-F FX5 User's Manual (Application) |
| | FX5UJCPU | The following function is available: • User web page | |
| | FX5SCPU | • A project for an FX5SCPU can be simulated. | Page 994 Modules supported by GX Simulator3 |
| Program configuration diagram | All CPUs | • The relation between program blocks, function blocks, and functions in a project can be displayed with a diagram by using this function. | Page 421 Checking/Editing the Relation between Programs |
| Library | RnPCPU RnPSFCPU | • A project including a user-defined tag FB can be exported as a library file. | — |
| Monitor ^{*3} | FX5UCPU FX5UJCPU | • The maximum and minimum values of scan time can be cleared from the monitor status bar during monitoring. | Page 634 Status monitoring |
| Watch | All CPUs | • Devices/labels used in a program can be registered in a batch from each editor. | Page 661 Registering devices/labels from program editor/label editor |
| | | • The "Binary Watch" screen appears by selecting a row of a label in a watch window, then right-clicking and selecting [Add the Selected Label to Binary Watch Window] from the shortcut menu. The current value of the label can be displayed in a binary format in this screen. | Page 665 Monitoring in a binary format |
| CC-Link IE TSN diagnostics ^{*3*4} | All CPUs | The following modules can be diagnosed: • DC safety input/transistor safety output combined modules (NZ2GNS12A2-16DTE and NZ2GNS12A2-14DT) | — |
| Firmware update ^{*3} | FX5UJCPU | • The firmware of modules can be updated using GX Works3. | Page 806 Firmware Update |

| Item | Module type | Description | Reference |
|----------------------|--|---|-----------|
| Options | All CPUs | <p>The following options are added:</p> <ul style="list-style-type: none"> • "Other Editor" ⇒ "Program Configuration Diagram" ⇒ "Auto-generation Target" • "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the Generic Data Type of Label" <p>The location of the following option is changed:</p> <ul style="list-style-type: none"> • Before change (version 1.070Y to 1.082L): "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Intelligent Function Module takes priority to be selected for module extension parameter" • After change (version 1.085P): "Online" ⇒ "Common Item" ⇒ "Operational Setting" ⇒ "Intelligent Function Module takes priority to be selected for module extended parameter" <p>By selecting "Yes" for this option, the module extended parameters for an intelligent function module are selected preferentially in the [Read] tab and [Verify] tab of the "Online Data Operation" screen.</p> <p>Selection items of the following option are changed:</p> <ul style="list-style-type: none"> • "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Display Format" ⇒ "Window Display Method" <p>Before change (version 1.020W to 1.082L)</p> <ul style="list-style-type: none"> • Open in One Window • Open a New Window <p>After change (version 1.085P)</p> <ul style="list-style-type: none"> • Open Single in Project • Open Single in Block • Open Single for Each Action/Transition | — |
| | RCP LHCP FX5UCPU FX5UCCPU FX5UJCPU | <p>The following option name is changed.</p> <ul style="list-style-type: none"> • Before change (version 1.080J to 1.082L): "Intelligent Function Module" ⇒ "Simple Motion" ⇒ "Operational Setting" ⇒ "Select Simple Motion Module Setting as write target" • After change (version 1.085P): "Intelligent Function Module" ⇒ "Simple Motion" ⇒ "Operational Setting" ⇒ "Select Simple Motion Module Setting as target" <p>By selecting "Yes" for this option, the simple motion module setting is selected in the [Read] tab of the "Online Data Operation" screen.</p> | |
| Others ^{*3} | FX5UJCPU | <p>The following modules can be used in a project:</p> <ul style="list-style-type: none"> • High speed pulse I/O modules (FX5-16ET/ES-H, FX5-16ET/ESS-H) | |


Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|------------------|---------------------|--|--|--|
| CPU parameter | RnCPU RnENCPU | | "Memory/Device Setting" ⇔ "Device/Label Memory Area Setting" ⇔ "Device/Label Memory Area Detailed Setting" ⇔ "Device Setting" ⇔ "<Detailed Setting>" | "Write Protection Setting" is added. |
| Module parameter | FX5CPU | | "Application Settings" ⇔ "Simple CPU Communication Setting" ⇔ "<Detailed Setting>" | The communication destinations can be filtered. |
| | FX5UCPU FX5UCCPU | | "Application Settings" ⇔ "Simple CPU Communication Setting" ⇔ "<Detailed Setting>" | <ul style="list-style-type: none"> "On Request" can be set for "Communication Setting." "MELSEC iQ-F(Ethernet module)" can be selected for "Communication Destination." "Options(Hexadecimal)" is added for "Communication Destination Setting." |
| | FX5UJCPU | | "Application Settings" ⇔ "Simple CPU Communication Setting" ⇔ "<Detailed Setting>" | <p>The following options can be selected for "Communication Destination":</p> <ul style="list-style-type: none"> MELSEC iQ-R (built-in Ethernet) MELSEC-Q (built-in Ethernet) MELSEC-L (built-in Ethernet) MELSEC iQ-L (built-in Ethernet) MELSEC-FX3 (Ethernet Block/Adapter) OMRON (CJ/CP series) KEYENCE (KV series) Panasonic (FP7 series) MODBUS/TCP-compatible device SIEMENS S7 series Panasonic (FP0H series) |
| | | | "Application Settings" ⇔ "FTP Client Settings" | Newly added |
| | RCPU | CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW, RD78G4(S), RD78G8(S), RD78G16(S)) | "Application Settings" ⇔ "Communication Mode" ⇔ "Communication Mode" | Newly added |
| | RnCPU RnENCPU | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇔ "Simple CPU Communication Setting" ⇔ "<Detailed Setting>" | <p>"SIEMENS S7 series(Extended)" can be selected for "Communication Destination."</p> <p>When setting any of the following devices for "Communication Destination," a bit device (F, TS, TC, STS, STC, CS, CC) and word device (TN, STN, CN) can be set:</p> <ul style="list-style-type: none"> Own station MELSEC iQ-R (built-in Ethernet) MELSEC iQ-L (built-in Ethernet) MELSEC iQ-F (built-in Ethernet) MELSEC-Q (built-in Ethernet) MELSEC-L (built-in Ethernet) MELSEC iQ-R (Ethernet module) MELSEC-Q (Ethernet module) MELSEC-L (Ethernet module) SLMP supported device (QnA compatible 3E frame) <p>When setting the following device for "Communication Destination," a bit device (F, TS, TC, CS, CC) and a word device (TN, CN) can be set:</p> <ul style="list-style-type: none"> MELSEC-A/AnS (Ethernet Module) <p>When setting the following device, a bit device (S, TS, CS) and a word device (TN, CN) can be set.</p> <ul style="list-style-type: none"> MELSEC-FX3 (Ethernet Block/Adapter) |
| | FX5CPU | Ethernet interface module (FX5-ENET/IP) | "Required Settings" ⇔ "EtherNet/IP Configuration Tool" | Newly added |

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|------------------|---------------------|--------------------------------------|--|---|
| Module parameter | FX5UCPU FX5UCCPU | CC-Link IE TSN module (FX5-CCLGN-MS) | "Basic Settings" ⇒ "Connection Device Information" ⇒ "TSN HUB Setting" | Newly added |
| | | | "Basic Settings" ⇒ "Communication Period Setting" ⇒ "Multiple Period Setting" ⇒ "Low-Speed" | "x32," "x64," and "x128" can be selected. |
| | | | "Basic Settings" ⇒ "Communication Period Setting" ⇒ "Basic Period Setting" ⇒ "System Reservation Time" | "200.00us" can be selected. |
| | | | "Application Settings" ⇒ "Communication Speed" | "100Mbps" can be selected. |

Version 1.087R

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|-----------------------------------|-------------|--|---|
| User authentication ^{*3} | RnSFCPU | <ul style="list-style-type: none"> RnSFCPU in which vulnerability measures are enhanced can be set to communicate with only GX Works3 with enhanced vulnerability measures. | Page 710 Preventing Illegal Access to a CPU Module (User Authentication) |
| Others | All CPUs | <ul style="list-style-type: none"> GX Developer and PX Developer cannot be installed together with GX Works3. |  GX Works3 Installation Instructions |

Version 1.090U

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|--|--------------------|---|--|
| Operating environment (operating system) | All CPUs | <ul style="list-style-type: none"> Windows 10 IoT Enterprise 2019 LTSC is supported. | — |
| Print | FX5UJCPU | <p>The following contents of a CC-Link IE TSN module (FX5-CCLGN-MS) can be printed:</p> <ul style="list-style-type: none"> Network Configuration Settings (CC-Link IE TSN configuration) Refresh Settings IP Filter Settings | — |
| PROFIBUS Configuration Tool | RCP | Parameters set in PROFIBUS Configuration Tool can be read. (To use this function, it is required that Version 1.06G or later of PROFIBUS Configuration Tool has been installed.) | MELSEC iQ-R PROFIBUS-DP Module User's Manual (Application) |
| Guidance flow | FX5CPU | <ul style="list-style-type: none"> An icon indicating that a flow of guidance is being displayed is added. | Page 208 Guidance flow function |
| | | <p>Guidance of the following functions is added:</p> <ul style="list-style-type: none"> Latch function File transfer function Web server function Simple CPU communication function | — |
| Verification | FX5UJCPU | <ul style="list-style-type: none"> Module parameters of a CC-Link IE TSN module (FX5-CCLGN-MS) can be verified. | — |
| AnyWireASLINK configuration window Sensor/device monitor | RCP | <p>The following functions are available even if an ID (address) of a remote module connected to a CC-Link IE Field-AnyWireASLINK bridge module is duplicated:</p> <ul style="list-style-type: none"> Automatic detection of connected devices Parameter processing of remote module Verification of connected devices and configurations Sensor/device monitor | — |
| CC-Link IE TSN configuration window ^{*4} | LHCP | <ul style="list-style-type: none"> A CC-Link IE TSN system can be configured using this window. | — |
| CC-Link IE TSN/CC-Link IE Field Network diagnostics | LHCP | <ul style="list-style-type: none"> CC-Link IE TSN compatible motion modules (LD78G4(S) and LD78G16(S)) can be diagnosed. | Page 230 Simple motion module/motion module (simple motion mode) |
| | FX5UJCPU | <ul style="list-style-type: none"> A CC-Link IE TSN module (FX5-CCLGN-MS) can be diagnosed. | |
| Changing a module | LHCP | <ul style="list-style-type: none"> MELSEC-L series simple motion modules (LD77MS2, LD77MS4, and LD77MS16) can be changed to MELSEC iQ-L series CC-Link IE TSN compatible motion modules (LD78G4(S) and LD78G16(S)). | Page 359 Changing the display format (type) of a transition |
| Ladder editor | All CPUs | <ul style="list-style-type: none"> When the position of the mouse cursor is in a nested master control instruction, a device/label used in the master control instruction and its comment are displayed on the title bar. | — |
| SFC diagram editor | All CPUs | <ul style="list-style-type: none"> The display format of a transition (Zoom) without contacts can be changed. | Page 391 User-defined tag FB |
| FB property page | RnPCPU RnPSFCPU | <ul style="list-style-type: none"> This function is available for user-defined tag FBs. | — |
| Specifying a connection destination | LHCP | <ul style="list-style-type: none"> A CPU module can be accessed via CC-Link IE TSN compatible motion modules (LD78G4(S) and LD78G16(S)). | — |

A

| Item | Module type | Description | Reference |
|--|---------------------------------|---|--|
| Simulation | RCPU | A project including either of the following modules can be simulated: • MELSECWinCPU (R102WCPU-W) | Page 994 Modules supported by GX Simulator3 |
| | | The following devices can be written to a CPU module during a simulation: • Input (X) • Output (Y) • Safety input (SA/X) • Safety output (SA/Y) | Page 606 Setting write target devices and their ranges Page 929 RCPUs |
| | RnCPU RnENCPU | The following functions are available: • Write-protect for device data (from outside the CPU module) • Scan Time Measurement | MELSEC iQ-R CPU Module User's Manual (Application) |
| | | The following CPU parameter is available: • Write Protection Setting | Page 1019 CPU parameter |
| | FX5UCPU FX5UCCPU FX5UJCPU | The following function is available: • Scan time clear | MELSEC iQ-F FX5 User's Manual (Application) |
| | FX5UCPU FX5UCCPU | • A project can be simulated while "On Request" is set for "Communication Setting" of "Simple CPU Communication Setting." | |
| | FX5UJCPU | The following options can be selected in "Communication Destination" of "Simple CPU Communication Setting." • MELSEC iQ-R (built-in Ethernet) • MELSEC iQ-L (built-in Ethernet) | |
| | | The following instructions are available: • File operation instructions (SP.FREAD, SP.FWRITE, SP.FDELETE, SP.FCOPY, SP.FMOVE, SP.FRENAME, SP.FSTATUS) • String processing instructions (\$MOV(P)_WS, SJIS2WS(P), SJIS2WSB(P), WS2SJIS(P)) | Page 1017 Application instruction |
| Intelligent function module monitor | RnCPU RnENCPU | • Diagnostic information of EtherNet/IP for a CC-Link IE TSN Plus master/local module (RJ71GN11-EIP) can be monitored. | — |
| Simple CPU communication diagnostics ^{*3} | RnPCPU | • RnPCPUs can be monitored. | |
| Recording ^{*3*4} | RnCPU RnENCPU | For RnCPUs and RnENCPU, the co-recording function is available by combining with the following modules: • Recorder module • Camera recorder module • CC-Link IE TSN compatible motion module • CC-Link IE TSN compatible motion module (simple motion mode) • Motion CPU • CC-Link IE TSN module | MELSEC iQ-R System Recorder Co-recording Function Reference Manual |
| Offline monitor ^{*3*4} | RnCPU RnENCPU | Data collected by using the recording function can be monitored in the following screens: • SFC diagram editor (including a Zoom) • SFC block list monitor • SFC all blocks batch monitor | Page 769 Checking a recording file |
| Firmware update | FX5CPU | • The check function before the update is enhanced. | — |
| Options | All CPUs | The following options are added: • "Program Editor" ⇒ "Common Item" ⇒ "Window" ⇒ "Message" ⇒ "Show a Message for Read-protected Data" • "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Detailed Display Setting" • "Other Editor" ⇒ "Label Editor Common" ⇒ "Extended Display Setting" ⇒ "Extended Display Area" • "Other Editor" ⇒ "Label Editor Common" ⇒ "Extended Display Setting" ⇒ "System Label Setting Display Area" | |
| | RnPCPU RnPSFCPU | The following option is added: • "Project" ⇒ "Process Control Extension Setting" ⇒ "FB Property Page" ⇒ "Setting File Save Destination" | |
| | FX5CPU | The following options are added: • "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Display Items" ⇒ "Device/Label Comment" • "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Display Items" ⇒ "Statement" • "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Display Items" ⇒ "Note" | |

Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|-----------------------|------------------|---|--|---|
| CPU parameter | RnCPU | | "Operation Related Setting" ⇨ "Co-recording Setting" | Newly added |
| | RnENCPU | | "PID Control Setting" is added. | Newly added |
| Module parameter | FX5UCPU | | | Newly added |
| | FX5UCCPU | | | |
| | RnPCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" | Newly added MELSEC iQ-R Ethernet User's Manual (Application) |
| | FX5UJCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | <ul style="list-style-type: none"> "On Request" can be set for "Communication Setting." "MELSEC iQ-F(Ethernet module)" can be selected for "Communication Destination." "Options(Hexadecimal)" is added for "Communication Destination Setting." |
| | RCPU | CC-Link IE TSN module (RJ71GN11-T2) | "Application Settings" ⇨ "Co-recording Setting" | Newly added |
| | RnCPU RnENCPU | CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) | Before change: "Basic Settings" ⇨ "External Device Configuration" After change: "Basic Settings" ⇨ "Ethernet Communication Setting" | The parameter name is changed. |
| | | | Before change: "Basic Settings" ⇨ "Own Node Settings" ⇨ "Opening Method" After change: "Basic Settings" ⇨ "Ethernet Communication Setting" ⇨ "Opening Method" | The location of the parameter is changed. |
| Memory card parameter | FX5UJCPU | | "Setting of File/Data Use or Not in Memory Card" ⇨ "Device Station Parameter" | Newly added |

Version 1.095Z

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|---|---------------------------------|--|---|
| Operating environment (operating system) | All CPUs | <ul style="list-style-type: none"> Windows 7, Windows 8, Windows 8.1, and Windows 10 (version 1511 or earlier) are no longer supported. | IGX Works3 Installation Instructions |
| Printing ^{*3} | FX5CPU | The following data can be printed: <ul style="list-style-type: none"> Attribute of a step: Operation hold step (SE or ST) | — |
| | FX5UJCPU FX5SCPU | The following data can be printed: <ul style="list-style-type: none"> SFC program Content of "SFC Setting" in CPU parameters | |
| Opening a GX Works2 format project ^{*3*4} | All CPUs | <ul style="list-style-type: none"> A ladder program can be imported even if a label of 'VAR' class of an FB instance is included in the ladder program. | |
| | RnCPU RnENCPU RnSFCPU | <ul style="list-style-type: none"> An MELSECNET/H network module (QJ71BR11) can be replaced with an MELSECNET/H network module (RJ71BR11). | |
| | LHCPU | The parameters of the following modules can be imported: <ul style="list-style-type: none"> Ethernet interface module (LJ71E71-100) CC-Link IE Field Network master/local module (LJ71GF11-T2) | |
| | FX5UJCPU FX5SCPU | <ul style="list-style-type: none"> An SFC program can be imported. | |
| Changing the module type/operation mode ^{*3} | FX5CPU | The following CPU parameter can be utilized when changing the module type from an FX5CPU to an RCP: <ul style="list-style-type: none"> "SFC Setting" ⇒ "Output Mode Setting at Block Stop" | |
| | FX5CPU | The following data can be utilized when changing the module type from an FX5UJCPU/FX5SCPU to an FX5UCPU/FX5UCCPU: <ul style="list-style-type: none"> SFC program Number of step relay (S) points that is set in "Memory/Device Setting" of the CPU parameter Content of "SFC Setting" in CPU parameters | |
| Module tool list | FX5UCPU FX5UCCPU FX5UJCPU | <ul style="list-style-type: none"> An information module (FX5-ENET) is supported. (Certificate Configuration Tool for FX5-ENET) (To use this function, it is required that Certificate Configuration Tool for FX5-ENET has been installed.) | Page 226 Other Settings of Intelligent Function Modules MELSEC iQ-F FX5-ENET User's Manual |
| AnyWireASLINK configuration window ^{*3} | LHCPU | <ul style="list-style-type: none"> In a project using a CC-Link IE Field Network master/local module (LJ71GF11-T2), an AnyWireASLINK system in which a CC-Link IE Field-AnyWireASLINK bridge module (NZ2AW1GFAL) is included can be configured using this window. | — |
| CC-Link IE TSN configuration window ^{*3} | RCP RnENCPU RnSFCPU | <ul style="list-style-type: none"> In a project using a CC-Link IE TSN module (RJ71GN11-SX), a CC-Link IE TSN system can be configured using this window. | |
| | | When the following parameter of a CC-Link IE TSN module (RJ71GN11-SX) is set to "Extend," "Communication Period Setting (LB/LW)" of a master station can be selected. <ul style="list-style-type: none"> "Application Setting" ⇒ "Link points extended setting" ⇒ "LB/LW Points Extended Setting" | |
| CC IE Field configuration window ^{*3} | RCP | A character string edited in Excel can be pasted to the station list in this window by the following operation: <ul style="list-style-type: none"> Right-click and select [Paste from Clipboard (Module Information) to Station List] from the shortcut menu. | |
| | LHCPU | The setting item in the station list in this window can be pasted to Excel by the following operation: <ul style="list-style-type: none"> Right-click and select [Copy to Clipboard of Station List (Header and Module Information)] | |
| Ethernet configuration window ^{*3} | LHCPU | <ul style="list-style-type: none"> In a project using an Ethernet interface module (LJ71E71-100), an Ethernet system can be configured using this window. | |
| iQ Sensor Solution function ^{*5} | LHCPU | This function is available in a project using the following modules: <ul style="list-style-type: none"> CC-Link IE Field Network master/local module (LJ71GF11-T2) CC-Link IE Field-AnyWireASLINK bridge module (NZ2AW1GFAL) | |

| Item | Module type | Description | Reference |
|--|-----------------------------|---|---|
| Creating a program Creating a library Program check Conversion Search/replacement Cross reference | FX5UJCPU FX5SCPU | <ul style="list-style-type: none"> Sequential Function Chart language is supported. | Page 270 Programming Function Page 353 Creating an SFC Program Page 934 FX5CPUs |
| Ladder editor | All CPUs | <ul style="list-style-type: none"> A label comment of an FB instance is displayed under the FB instance name. | Page 285 Display of an FB instance |
| | | <ul style="list-style-type: none"> Listed instructions can be imported even if a label of 'VAR' class of an FB instance is included in a CSV file. | Page 309 Importing from a CSV file |
| | | <ul style="list-style-type: none"> By setting an option, the height of an inline structured text box can be adjusted automatically. | Page 293 Changing the number of rows to display |
| SFC program | RCP LHCP | <ul style="list-style-type: none"> A transition of TRUE or SM400 can be created automatically when the transition is created in MELSAP-L (instruction format). | Page 382 Creating Zooms (MELSAP-L (instruction format)) |
| | FX5CPU | <ul style="list-style-type: none"> The ladder edit mode of a ladder editor (Zoom) can be switched to the monitor write mode. | — |
| | FX5CPU | <ul style="list-style-type: none"> An attribute of a step can be changed to an operation hold step (SE or ST). | — |
| Program configuration diagram | All CPUs | <ul style="list-style-type: none"> A program configuration diagram can be edited. | Page 68 Available menus when displaying a program configuration diagram Page 426 Edit mode |
| Device comment editor | All CPUs | <ul style="list-style-type: none"> Linefeed comments can be displayed or hidden in a batch. | Page 413 Configuration of a device comment editor |
| Device list | All CPUs | <ul style="list-style-type: none"> A device comment can be edited directly. | Page 480 Displaying Device Usage |
| Specifying a connection destination* ³ | RnCPU RnENCPU RnSFCPU | When using CC-Link IE TSN modules (RJ71GN11-T2, RJ71GN11-EIP, RJ71GN11-SX), "Module" displayed in the "Specify Connection Destination" screen is changed as follow: <ul style="list-style-type: none"> Before change: RJ71GN11(-T2/-EIP) After change: RJ71GN11 | — |
| Writing data to a programmable controller* ⁴ Reading data from a programmable controller* ⁴ | RnCPU RnENCPU RnSFCPU | <ul style="list-style-type: none"> Data of CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW) can be written to or read from the modules in the "Online Data Operation" screen. | Page 604 Data in a motion module Page 610 Data in a motion module |
| Writing data to a programmable controller* ³ Reading data from a programmable controller* ³ Deleting data in a programmable controller* ³ | FX5UJCPU FX5SCPU | The following data can be written, read, and deleted: <ul style="list-style-type: none"> SFC program Content of "SFC Setting" in CPU parameters | — |
| Online program change* ³ | FX5CPU | The following data can be written to a CPU module using this function: <ul style="list-style-type: none"> Single SFC block*³ SFC active block SFC inactive block Zoom | Page 621 Online program change of SFC programs |
| Monitor* ³ | FX5UCPU FX5UCCPU | The following monitor function is available: <ul style="list-style-type: none"> SFC-activated step monitor | Page 651 Monitoring SFC steps which were activated |
| | FX5UJCPU FX5SCPU | The following monitor functions are available: <ul style="list-style-type: none"> SFC diagram monitor SFC auto-scroll Zoom monitor SFC block list monitor SFC-activated step monitor SFC all blocks batch monitor | |
| | FX5SCPU | <ul style="list-style-type: none"> The maximum and minimum values of scan time can be cleared from the monitor status bar during monitoring. | Page 634 Status monitoring |
| Scan time measurement* ³ | RnSFCPU | <ul style="list-style-type: none"> In a project for an RnSFCPU, a scan time can be measured for any sections in a standard program. | Page 675 Measuring the Scan Time of a Program |

| Item | Module type | Description | Reference |
|--|-----------------------------|--|--|
| Sensor/device monitor ^{*3} | LHCPU | This function is available in a project using the following module: • CC-Link IE Field Network master/local module (LJ71GF11-T2) | — |
| Specified program monitor ^{*3} | RnSFCPU | • Devices/labels after executing a specified program can be monitored. | Page 633 When monitoring devices/labels in a specified program |
| Watch Intelligent function module monitor | All CPUs | • The [Start Watching] and [Stop Watching] buttons are added in a watch window and the "Intelligent Function Module Monitor" window. | Page 658 Checking Current Values by Registering Devices/Labels Page 680 Checking Current Values in an Intelligent Function Module |
| Watch ^{*3} | FX5UJCPU FX5SCPU | • The current value of a device/label used in an SFC program can be checked. | — |
| Offline monitor | All CPUs | • The value to move the index in "Previous Frame"/"Next Frame" can be set. | Page 774 Seek bar |
| Security key | All CPUs | • The secure mode can be set for a security key. | Page 699 Secure mode |
| Diagnostics ^{*3} | FX5UJCPU FX5SCPU | • The cursor can jump to the location in which an error has occurred in an SFC program. | — |
| Ethernet diagnostics | LHCPU | The following module can be diagnosed: • Ethernet interface module (LJ71E71-100) | |
| CC-Link IE TSN diagnostics | All CPUs | The following modules can be diagnosed: • FPGA modules (NZ2GN2S-D41D01, NZ2GN2S-D41P01, NZ2GN2S-D41PD02) • Inverter (FR-A800-F/G) | |
| | | The following shortcut menu name is changed: • Before change: [Error History] • After change: [Error/Event History] | Page 743 Displaying an error history |
| CC-Link IE Field Network diagnostics ^{*3} | RnCPU RnENCPU | The following module can be diagnosed: • CC-Link IE TSN module (RJ71GN11-SX) | — |
| | All CPUs | The following modules can be diagnosed: • DC safety I/O modules (NZ2GFSS2-16DTE-S1, NZ2GFSS2-8D-S1, NZ2GFSS2-8TE-S1, NZ2GFSS2-32D-S1) | — |
| | LHCPU | The following module can be diagnosed: • CC-Link IE Field Network master/local module (LJ71GF11-T2) | |
| MELSECNET diagnostics ^{*3*4} | RnCPU RnENCPU RnSFCPU | The following module can be diagnosed: • MELSECNET/H network module (RJ71BR11) | Page 745 MELSECNET diagnostics |

| Item | Module type | Description | Reference |
|--|---------------------|--|-----------|
| Simple CPU communication diagnostics ^{*3} | RnSFCPU | <ul style="list-style-type: none"> RnSFCPU can be diagnosed. | — |
| Options | All CPUs | <p>The following options are added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Display Setting of Label Name" "Program Editor" ⇒ "Ladder Editor" ⇒ "Inline Structured Text" ⇒ "Operational Setting" ⇒ Automatically Adjust Inline Structured Text Height "Other Editor" ⇒ "Program Configuration Diagram" ⇒ "Update Configuration Diagram" ⇒ "Keep Element Arrangement" "Other Editor" ⇒ "Program Configuration Diagram" ⇒ "Message" | |
| | RCPULHCPU | <p>The following option is added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Automatically Set Transition to TRUE/SM400" | |
| | RnSFCPU | <p>The following option is added:</p> <ul style="list-style-type: none"> "Monitor" ⇒ "Common Item" ⇒ "Timing to Execute Monitor Function and Modify Value Function" ⇒ "After the execution of specified program" | |
| | FX5UJCPU FX5SCPU | <p>The following options are added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "SFC Diagram Editor" "Monitor" ⇒ "SFC Diagram Editor" | |
| Others ^{*3} | RnSFCPU | <p>The following modules are available:</p> <ul style="list-style-type: none"> MELSECNET/H network modules (RJ71LP21-25, RJ71LP21-25(R), RJ71BR11)) | |
| | All CPUs | <p>Terms are changed as follows:</p> <p>■Before change</p> <ul style="list-style-type: none"> Slave station, slave device, slave module <p>■After change</p> <ul style="list-style-type: none"> CC-Link, CC-Link IE Field, CC-Link IE TSN: Device station CC-Link IE Field Basic: Remote station AnyWireASLINK: Remote module | |

Change of Network-related Terminology(FA-A-0394)

Parameters

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|------------------|---------------------------------|---|---|---|
| CPU parameter | LHCPU | | "Routing Setting" | Newly added |
| | FX5UCPU FX5UCCPU | | "SFC Setting" ⇨ "Output Mode Setting at Block Stop" | Newly added |
| | FX5UJCPU FX5SCPU | | "SFC Setting" | Newly added |
| Module parameter | RnPCPU | | "Application Settings" ⇨ "Web Server Settings" | Newly added |
| | RnSFCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" | Newly added |
| | FX5SCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" | <ul style="list-style-type: none"> "On Request" can be set for "Communication Setting." "MELSEC iQ-F(Ethernet module)" can be selected for "Communication Destination." "Options(Hexadecimal)" is added for "Communication Destination Setting." |
| | RnCPU RnENCPU RnSFCPU | CC-Link IE TSN module (RJ71GN11-SX) | "Basic Settings" ⇨ "Refresh Settings" | Link side devices can be set in a batch. |
| | RnSFCPU | CC-Link IE Field Network module (RJ71GF11-T2) | "Application Settings" ⇨ "Safety Communication Setting" ⇨ "<Detailed Setting>" | "Safety Protocol Version" is added. |
| | FX5UCPU FX5UCCPU FX5UJCPU | Information module (FX5-ENET) | "Application Settings" ⇨ "DNS Settings" | Newly added |
| | | | "Application Settings" ⇨ "Security" ⇨ "Certificate Configuration Tool Connection Setting" | Newly added |
| | | | "Application Settings" ⇨ "Mail Function Setting" | Newly added |
| | | | "Application Settings" ⇨ "MQTT Communication Setting" | Newly added |

Version 1.096A

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|---------|-------------|--|--|
| Project | All CPUs | A security version can be set in a project. By setting the security version to "2," the risk for the vulnerability can be reduced. | Page 722 Preventing Illegal Access to/Falsification of Data (Security Version) |

Version 1.100E


All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|--|-----------------------------|--|---|
| Print | All CPUs | <ul style="list-style-type: none"> A data flow diagram can be printed. | Page 97 Printing a data flow diagram |
| Opening a GX Works2 format project ^{3*4} | RCP | <ul style="list-style-type: none"> An AnyWireASLINK master module (QJ51AW12AL) can be replaced with an AnyWireASLINK master module (RJ51AW12AL). | — |
| | RnCPU | <p>The following MELSECNET/H network modules (remote master station) can be replaced with a CC-Link IE Field Network module (RJ71GF11-T2):</p> <ul style="list-style-type: none"> QJ71LP21-25 QJ71LP21S-25 QJ71LP21G QJ71BR11 | |
| Adding a new module | All CPUs | <ul style="list-style-type: none"> A module can be searched for by entering a module type in the text box in the "Add New Module" screen. | Page 215 Searching for a module |
| Ethernet configuration Sensor/device monitor | All CPUs | <p>An IP address, port number, subnet mask, and default gateway can be displayed in hexadecimal by selecting the following menu:</p> <ul style="list-style-type: none"> [Edit] ⇒ [IP Address/Port No. Input Format] ⇒ [Hexadecimal] | — |
| CC-Link IE TSN configuration window ^{3*4} | All CPUs | <ul style="list-style-type: none"> The display status of the station list (simple display/detailed display) can be retained even after closing this window. | — |
| | All CPUs | <p>By using the following menu, the specified number of selected device stations can be copied, and can be pasted to the station list.</p> <ul style="list-style-type: none"> Right-click and select [Module Continuous Arrangement] from the shortcut menu | |
| | RnCPU RnENCPU RnSFCPU | <p>The CC-Link IE Field Configuration window can be displayed by selecting the following menu after selecting a CC-Link IE TSN-CC-Link IE Field Network bridge module (NZ2GN-GFB) of which "Master Station" is set for "Station-specific mode setting" in the module parameter:</p> <ul style="list-style-type: none"> [CC-Link IE TSN Configuration] ⇒ [Open System Configuration] ⇒ [Open CC IE Field Configuration] | |
| | RCP | <ul style="list-style-type: none"> When displaying this window from the module parameter for a CC-Link IE TSN module (RJ71GN11-SX), the "CC-Link IE TSN Configuration Information" window can be displayed. | |
| | RCP | <p>If the following parameter for a CC-Link IE TSN module (RJ71GN11-SX) is set to "Enable," "RX Setting," "RY Setting," "RWw Setting," and "RWr Setting" are blank when adding a device station in this window.</p> <ul style="list-style-type: none"> "Application Settings" ⇒ "Master Station Shift Setting" | |
| | RCP | <p>When the modules shown below are used, the following operations can be performed in the "IP Address Setting" screen: real machine information detection, setting an IP address, and starting/stopping the indicator display.</p> <ul style="list-style-type: none"> CC-Link IE TSN module (RJ71GN11-T2) CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW) | |
| | LHCPU | <p>When using CC-Link IE TSN compatible motion modules (LD78G4(S) and LD78G16(S)), the following items can be displayed.</p> <ul style="list-style-type: none"> Cyclic Transmission Time(Minimum value) Communication Period Interval(Minimum value) | |
| CC IE Field configuration window ³ | RnCPU RnENCPU RnSFCPU | <ul style="list-style-type: none"> In a project using a CC-Link IE TSN-CC-Link IE Field Network bridge module (NZ2GN-GFB), a CC-Link IE Field Network system in which the network bridge module is included can be configured using this window. | — |
| iQ Sensor Solution function ⁵ | RnCPU RnENCPU RnSFCPU | <ul style="list-style-type: none"> This function is available in a project using a CC-Link IE TSN-CC-Link IE Field Network bridge module (NZ2GN-GFB). | Page 218 iQ Sensor Solution functions |
| Importing data | All CPUs | <p>The following data can be imported from an XML file output with Simulink PLC Coder:</p> <ul style="list-style-type: none"> POUs (program block, function block, function, program body, local label) Global label Structure | Page 137 Importing data (Simulink PLC Coder XML format) |

A

| Item | Module type | Description | Reference |
|---|--------------------------------------|--|---|
| Global label editor | All CPUs | <ul style="list-style-type: none"> A structure type global label can be duplicated including the setting of a device assigned to a global label. | Page 77 Available menus when displaying a label editor Page 242 Duplicating a structure type global label |
| FB property management | RnPCPU RnPSFCPU | <ul style="list-style-type: none"> The "FB Property Management (Online)" screen and the "FB Property Management (Offline)" screen can be displayed from an icon on the tool bar and the tag FB setting editor. | Page 408 FB Property Management (Offline) screen Page 689 FB Property Management (Online) screen |
| Specifying a connection destination | RCPU | <ul style="list-style-type: none"> Connection via a CC-Link IE TSN interface board is supported. | Page 46 Connection through I/F boards |
| | LHCPU | <ul style="list-style-type: none"> GX Works3 can access an LHCPU by using the GOT transparent function^{*4}. | Page 589 Accessing via GOT (GOT Transparent Function) |
| Registering/canceling forced input/output ^{*3} | FX5CPU | <ul style="list-style-type: none"> Input/output devices can forcibly be turned ON/OFF. | Page 666 Turning Input/Output Devices ON/OFF Forcibly |
| Verification | FX5CPU | <ul style="list-style-type: none"> Module parameters of a high-speed counter module (FX5-2HC/ES) can be verified. | — |
| Reading data from a programmable controller | All CPUs | <ul style="list-style-type: none"> Device memory can be read even when a project is not opened. | — |
| Watch | All CPUs | <ul style="list-style-type: none"> A module label can be registered by dragging and dropping the module label from the [Module] tab in the element selection window onto a watch window. | — |
| CC-Link IE TSN diagnostics | RCPU | <ul style="list-style-type: none"> In a project using a CC-Link IE TSN module (RJ71GN11-SX), the master station transition function is supported. | — |
| | All CPUs | The following modules can be diagnosed: <ul style="list-style-type: none"> FCU8-EX569 | — |
| | All CPUs | <ul style="list-style-type: none"> Contents displayed in the "Error/Event History" screen can be exported to a CSV file by clicking the [Save to CSV File] button in the "Error/Event History" screen. | — |
| | RnCPU RnENCPU RnSFCPU | The following modules can be diagnosed: <ul style="list-style-type: none"> CC-Link IE TSN-CC-Link IE Field Network bridge module (NZ2GN-GFB) | — |
| | RnCPU RnENCPU RnSFCPU | The CC-Link IE Field Diagnostics screen can be displayed by the following operation after selecting a CC-Link IE TSN-CC-Link IE Field Network bridge module (NZ2GN-GFB). <ul style="list-style-type: none"> Right-click data and select [CC-Link IE Field Diagnostics] from the shortcut menu. | Page 743 Displaying the CC-Link IE Field Diagnostics screen |
| CC-Link IE Field Network diagnostics ^{*3} | RnCPU RnENCPU RnSFCPU | The following modules can be diagnosed: <ul style="list-style-type: none"> CC-Link IE TSN-CC-Link IE Field Network bridge module (NZ2GN-GFB) | — |
| Offline monitor | All CPUs | <ul style="list-style-type: none"> Search results displayed in the "Changed Point List" window can be sorted. | Page 783 Sorting search results |
| Safety module operation ^{*3*4} | RnSFCPU | <ul style="list-style-type: none"> This function is available for a module used in a system using an RnSFCPU. | Page 798 Safety module operation |
| Options | All CPUs | The following option is added: <ul style="list-style-type: none"> "Find/Replace" ⇨ "Cross Reference" ⇨ "Find Condition" ⇨ "Analyze and Find Constant in Find When Constant Label is Specified in Array Element" | — |
| | RnCPU RnENCPU RnSFCPU LHCPU | The following option is added: <ul style="list-style-type: none"> "Parameter" ⇨ "User-defined Setting" | — |
| Others | All CPUs | Terms are changed as follows: ■Before change <ul style="list-style-type: none"> Authentication Class ■After change <ul style="list-style-type: none"> CC-Link IE TSN Class |  Change of the Term Used in Software and Manuals Related to CC-Link IE TSN |

■Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|--------------------------------|-------------|---|--|--|
| CPU parameter | RnSFCPU | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Detailed Setting" ⇨ "Device Setting" ⇨ "<Detailed Setting>" | "Write Protection Setting" is added. |
| Module parameter | RCPU | CC-Link IE TSN module (RJ71GN11-SX) | "Application Settings" ⇨ "Master Station Shift Setting" | Newly added |
| Module parameter (EtherNet/IP) | RCPU | CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) | "Basic Settings" ⇨ "Refresh Settings" | The setting values of module extended parameters can be applied. To use this function, EtherNet/IP Configuration tool Version 1.04E or later is required to be installed. For details on EtherNet/IP Configuration tool, refer to the following:  MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual |

Version 1.105K

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|--|---|--|---|
| Work window | RnCPU (R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU | <ul style="list-style-type: none"> A work window can be moved vertically and horizontally by pressing the Windows key + / / / keys. | Page 52 Moving a work window |
| Verification | All CPUs | <p>When verifying a project including either of the following modules, the start I/O number and the module name are displayed in "Module Extended Parameter(Simple Motion)" of the "Project Verify" screen or "Online Data Operation" screen:</p> <ul style="list-style-type: none"> CC-Link IE TSN compatible motion module (simple motion mode) Simple motion module | — |
| | RCP LHCPU | <p>Module extended parameters of the following modules can be verified.</p> <ul style="list-style-type: none"> MELSEC iQ-R positioning module MELSEC iQ-R serial communication module MELSEC-L LD75P/LD75D type positioning module MELSEC-L serial communication module | <p>Page 152 Module extended parameters</p> <p>Page 616 Module extended parameters</p> |
| Ethernet configuration window CC-Link IE TSN configuration window | All CPUs | <p>The "IP Address List" window can be displayed by selecting the following menu:</p> <p>In addition, the list of IP addresses used in the Ethernet configuration or CC-Link IE TSN configuration are displayed by clicking the [Update] button in the "IP Address List" screen.</p> <ul style="list-style-type: none"> [View] ⇒ [Docking Window] ⇒ [IP Address List] | — |
| CC-Link IE TSN configuration window ^{*3*4} | RnCPU RnENCPU | <p>When the following parameter of a CC-Link IE TSN module (RJ71GN11-T2) or CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) is set to "Extend," "Communication Period Setting (LB/LW)" of a master station can be selected.</p> <ul style="list-style-type: none"> "Application Setting" ⇒ "Link points extended setting" ⇒ "LB/LW Points Extended Setting" | — |
| | RnCPU RnENCPU RnSFCPU | <p>When the own station is a CC-Link IE TSN compatible motion module (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW, RD78G4(S), RD78G8(S), or RD78G16(S)), the following function is available even if data of the master station is not linked:</p> <ul style="list-style-type: none"> Connected/disconnected module detection | |
| | | <p>Information on the network topology can be acquired and applied to this window by using the following function for a CC-Link IE TSN compatible motion module (RD78GHV or RD78GHW):</p> <ul style="list-style-type: none"> Connected/disconnected module detection | |
| | FX5UCPU FX5UCCPU FX5UJCPU | <p>When using a CC-Link IE TSN module (FX5-CCLGN-MS) and CC-Link IE TSN compatible motion modules (FX5-40SSC-G(S) and FX5-80SSCG(S)), the following items can be displayed.</p> <ul style="list-style-type: none"> Cyclic Transmission Time (Min.) Communication Period Interval (Min.) | |
| | | <p>When using a CC-Link IE TSN module (FX5-CCLGN-MS), the PDO mapping parameters of device stations can be set in a batch by using the following menu:</p> <ul style="list-style-type: none"> [CC-Link IE TSN Configuration] ⇒ [Batch Setting of PDO Mapping] | |
| AnyWireASLINK configuration window ^{*3*4} | | <p>When using a CC-Link IE TSN module (FX5-CCLGN-MS), the following items can be set for a device station:</p> <ul style="list-style-type: none"> Motion Control Station PDO Mapping Setting | |
| | LHCPU | <p>Information on remote modules of an AnyWireASLINK interface module (LJ51AW12AL) can be backed up or restored by using the following menu:</p> <ul style="list-style-type: none"> "AnyWireASLINK Configuration" ⇒ "Online" ⇒ "Backup Remote Module"/"Restore Remote Module" | — |
| Label editor | All CPUs | <ul style="list-style-type: none"> When entering array element values as an offset, the values are automatically corrected. | Page 245 Entering array element values directly |

| Item | Module type | Description | Reference |
|-------------------------------|--|--|---|
| Program configuration diagram | All CPUs | <ul style="list-style-type: none"> Multiple blocks can be copied and pasted at once. | Page 427 Common operations of elements |
| | | <ul style="list-style-type: none"> A block can be copied and pasted even if the projects of the copy source and copy destination are different. | |
| | | <ul style="list-style-type: none"> The editor for the program body of a selected block can be displayed. | Page 68 Available menus when displaying a program configuration diagram Page 423 Displaying a program editor |
| Device memory | All CPUs | <ul style="list-style-type: none"> Device memory can be imported from a CSV file. | Page 455 Importing device memory data |
| Search/replacement | All CPUs | <p>In an ST editor (including a Zoom) where either of the following programs is displayed, devices, labels, instructions, and character strings in a selected range can be searched for or replaced in a batch:</p> <ul style="list-style-type: none"> ST program Inline structured text program used in an FBD/LD program | — |
| Data flow analysis | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> Physical relation among devices in equipment operation can be estimated by using a recording file. | Page 490 Analyzing equipment operation with AI |
| | RnCPU (R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnPCPU RnSFCPU LHCPU FX5CPU | <ul style="list-style-type: none"> Physical relation among devices in equipment operation can be estimated by using a logging file. | |
| Simulation | RCPU | <p>A project including the following module can be simulated:</p> <ul style="list-style-type: none"> CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) | Page 994 Modules supported by GX Simulator3 |
| | RnCPU RnENCPU | <p>A project including the following module can be simulated:</p> <ul style="list-style-type: none"> CC-Link IE TSN module (RJ71GN11-SX) | |
| | RnPCPU | <p>The following function is available:</p> <ul style="list-style-type: none"> Web server | MELSEC iQ-R CPU Module User's Manual (Application) |
| | | <p>The following module parameters are available:</p> <ul style="list-style-type: none"> IP Address Setting Web Server Settings | Page 1019 Supported parameters |
| | RnSFCPU | <p>A project including either of the following modules can be simulated:</p> <ul style="list-style-type: none"> Input module with safety functions (RX40NC6S-TS) Output module with safety functions (RY48PT20S-TS) | Page 994 Modules supported by GX Simulator3 |
| | | <p>The following functions are available:</p> <ul style="list-style-type: none"> Write-protect for device data (from outside the CPU module) Scan time measurement Specified program monitor | MELSEC iQ-R CPU Module User's Manual (Application) |
| | | <p>The following CPU parameter is available:</p> <ul style="list-style-type: none"> Write Protection Setting | Page 1019 Supported parameters |
| | RnPCPU RnSFCPU | <p>The following function is available:</p> <ul style="list-style-type: none"> Simple CPU communication | MELSEC iQ-R CPU Module User's Manual (Application) |
| | | <p>The following module parameter is available:</p> <ul style="list-style-type: none"> Simple CPU Communication Setting | Page 1019 Supported parameters |
| | RnCPU RnENCPU RnSFCPU | <p>A project including the following module can be simulated:</p> <ul style="list-style-type: none"> MELSECNET/H network module (RJ71BR11) | Page 994 Modules supported by GX Simulator3 |

| Item | Module type | Description | Reference |
|-------------------------------|---|---|---|
| Simulation | LHCPU | A project including any of the following modules can be simulated: <ul style="list-style-type: none"> • Programmable controller CPU (L32HCPU) • CC-Link IE TSN compatible motion modules (LD78G4(S), LD78G16(S)) • Ethernet interface module (LJ71E71-100) • CC-Link IE Field Network master/local module (LJ71GF11-T2) | Page 994 Modules supported by GX Simulator3 |
| | | The following functions are available: <ul style="list-style-type: none"> • Link direct device setting • Network parameter (CC-Link IE TSN) | Page 1004 Supported CPU module functions |
| | | The following CPU parameter is available: <ul style="list-style-type: none"> • Link Direct Device Setting | Page 1019 Supported parameters |
| | FX5CPU | The following function is available: <ul style="list-style-type: none"> • External input/output forced on/off | IMELSEC iQ-F FX5 User's Manual (Application) |
| | | The following instructions are available: <ul style="list-style-type: none"> • SFC control instructions (PAUSE, RSTART) | Page 1017 Application instruction |
| | FX5UCPU FX5UCCPU | The following function is available: <ul style="list-style-type: none"> • PID control via parameter | IMELSEC iQ-F FX5 User's Manual (Application) |
| | | The following CPU parameter is available: <ul style="list-style-type: none"> • Heating/Cooling PID Control Setting | Page 1019 Supported parameters |
| | FX5SCPU | The following function is available: <ul style="list-style-type: none"> • Scan time clear | IMELSEC iQ-F FX5 User's Manual (Application) |
| | FX5UJCPU | A project including any of the following modules can be simulated: <ul style="list-style-type: none"> • Programmable controller CPU (FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, FX5UJ-60MT/DSS) | Page 994 Modules supported by GX Simulator3 |
| | FX5UCPU FX5UCCPU FX5UJCPU | A project including the following module can be simulated: <ul style="list-style-type: none"> • High-speed counter module (FX5-2HC/ES) | |
| | FX5UJCPU FX5SCPU | The following function is available: <ul style="list-style-type: none"> • SFC | IMELSEC iQ-F FX5 User's Manual (Application) |
| | | • A project can be simulated while "On Request" is set for "Communication Setting" of "Simple CPU Communication Setting." | |
| | | The following instructions are available: <ul style="list-style-type: none"> • SFC control instructions • SFC dedicated instructions | Page 1017 Application instruction |
| | | The following CPU parameter is available: <ul style="list-style-type: none"> • SFC Setting | Page 1019 Supported parameters |
| Online program change | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> • The online program change can be performed while the recording function is running. | Page 622 Online program change during recording operation |
| Monitoring Offline monitor | All CPUs | During monitoring (while the monitor status is displayed on the monitor status bar), monitoring of another program starts automatically when opening its program editor by selecting "Yes" for the following option: <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Common Item" ⇒ "'Ladder'/ST/'FBD'/LD'/SFC'" ⇒ "Operational Setting" ⇒ "Start monitoring when opening program editor during monitoring" | — |
| Monitoring | All CPUs | <ul style="list-style-type: none"> • Labels of "VAR_GLOBAL_CONSTANT" and "VAR_CONSTANT" classes can be monitored in an ST editor. | |
| FB property window | All CPUs | <ul style="list-style-type: none"> • Labels can be registered in a watch window from the "FB Property" window. | Page 661 Registering devices/labels from the "FB Property" window |

| Item | Module type | Description | Reference |
|--|---|---|--|
| Watch | All CPUs | <ul style="list-style-type: none"> The [Clear All] button is added in a watch window. | Page 658 Checking Current Values by Registering Devices/Labels |
| | All CPUs | <ul style="list-style-type: none"> Labels of "VAR_GLOBAL_CONSTANT" and "VAR_CONSTANT" classes can be monitored. | Page 658 Displaying a constant |
| | All CPUs | <ul style="list-style-type: none"> A device/label that is already registered in a watch window can be registered to a different watch window. | Page 662 Registering devices/labels again |
| | All CPUs | <ul style="list-style-type: none"> When selecting a range including a device/label in a program editor while using this function, the character strings that indicate information such as a program block name and program type are displayed after the title "[Automatic Registration: Watching]." | Page 664 Title of a watch window |
| Process control function | RnPCPU RnPSFCPU | <ul style="list-style-type: none"> PX Developer is not required to be installed when using a faceplate. | Page 684 Checking tag data on the gauge window (faceplate) |
| User authentication ^{*3} | RnPSFCPU | <ul style="list-style-type: none"> For an RnPSFCPU in which vulnerability measures are enhanced, whether or not to communicate with only GX Works3 with enhanced security measures can be selected. | Page 710 Preventing Illegal Access to a CPU Module (User Authentication) |
| Sensor/device monitor ^{*3*4} | LHCPU | <p>Information on remote modules of an AnyWireASLINK interface module (LJ51AW12AL) can be backed up or restored by using the following menu:</p> <ul style="list-style-type: none"> "Online" ⇒ "Backup Remote Module"/"Restore Remote Module" | — |
| CC-Link IE TSN diagnostics ^{*3*4} | All CPUs | <p>The following module can be diagnosed:</p> <ul style="list-style-type: none"> Servo amplifier (MR-J5-G-LL) | — |
| | RnCPU RnENCPU | <ul style="list-style-type: none"> In a project using a CC-Link IE TSN module (RJ71GN11-T2), the master station transition function is supported. | |
| | FX5UCPU FX5UCCPU FX5UJCPU | <p>A mode set in the following parameter is displayed when diagnosing a CC-Link IE TSN module (FX5-CCLGN-MS):</p> <ul style="list-style-type: none"> "Application Settings" ⇒ "Communication Mode" ⇒ "Communication Mode" | |
| | FX5UCPU FX5UCCPU FX5UJCPU | <ul style="list-style-type: none"> The error history of an extension module can be checked when diagnosing a CC-Link IE TSN module (FX5-CCLGN-MS). | |
| CC-Link IE Field Network diagnostics ^{*3*4} | RnSFCPU | <p>The following modules can be diagnosed:</p> <ul style="list-style-type: none"> DC safety input/transistor safety output combined modules (NZ2GNS12A2-16DTE and NZ2GNS12A2-14DT) | — |
| Reading a recording file | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnSFCPU | <ul style="list-style-type: none"> A logging file of servo system recorder can be read from a motion CPU/motion module at the same time as a recording file. | Page 763 Reading a logging file of the servo system recorder |
| Logging configuration tool | All CPUs | <p>When starting CPU Module Logging Configuration Tool, a device/label selected in any of the following windows is automatically set to the "Data" setting screen of CPU Module Logging Configuration Tool.</p> <ul style="list-style-type: none"> Ladder editor ST editor FBD/LD editor Watch window | Page 757 Starting method of CPU Module Logging Configuration Tool |
| Offline monitor | All CPUs | <ul style="list-style-type: none"> Search results displayed in the "Changed Point List" window can be copied. | Page 783 Copying search results |
| | | <p>The following operations are available in an SFC diagram editor during offline monitoring:</p> <ul style="list-style-type: none"> Right-click a cell and select [Wave Display (Offline Monitor)] from the shortcut menu. Right-click a cell and select [Find Changed Point] from the shortcut menu. | — |
| Options | All CPUs | <p>The following options are added:</p> <ul style="list-style-type: none"> "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Add action/transition when inserting SFC diagram symbol" "Other Editor" ⇒ "Program Configuration Diagram" ⇒ "Message" ⇒ "Show a Message in Copying Block" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Set the operation result to 0 for the division whose divisor is 0" "Monitor" ⇒ "Common Item" ⇒ "'Ladder'/'ST'/'FBD'/'LD'/'SFC'" ⇒ "Operational Setting" ⇒ "Start monitoring when opening program editor during monitoring" | — |

Parameters

| Category | Module type | Module | Parameter*3*4 | Description |
|------------------|--|---|--|--|
| CPU parameter | FX5UJCPU | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Detailed Setting" ⇨ "Latch type setting of the latch relay (L)" | "Latch (2)" can be selected. |
| | | | "Memory/Device Setting" ⇨ "Device/Label Memory Area Setting" ⇨ "Device/Label Memory Area Detailed Setting" ⇨ "Latch Type Setting of Latch Type Label" | "Latch (2)" can be selected. |
| Module parameter | RnCPU RnENCPU RnPCPU (process mode) RnSFCPU | Ethernet interface modules (_RJ71EN71(E+IEC), _RJ71EN71(E+IEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(E+E)) | "Application Settings" ⇨ "Simple Device Communication Setting" ⇨ "Resource Setting" | "Extension 2" can be selected. |
| | | | "Application Settings" ⇨ "Simple Device Communication Setting" ⇨ "Communication Destination Setting" ⇨ "<Detailed Setting>" | When "Extension 2" is set for "Resource Setting," up to 64 communication destination settings can be configured, imported, and exported. |
| | | | "Application Settings" ⇨ "Simple Device Communication Setting" ⇨ "Communication Destination Setting" ⇨ "<Detailed Setting>" ⇨ [Import] button | When importing a setting file for destinations of simple device communication, the protocol of the number specified in "Import Source Setting No. in File" can be added to the end of the protocol of the number specified in "Import Destination Setting No. in Project." |
| | RnCPU RnENCPU | CC-Link IE TSN module (RJ71GN11-T2) CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) | "Basic Settings" ⇨ "Communication Period Setting" ⇨ "Multiple Period Setting" ⇨ "Normal-Speed" | "x2" and "x8" can be selected. |
| | | | "Application Settings" ⇨ "Link points extended setting" | Newly added |
| | | | "Application Settings" ⇨ "Interlink Transmission Settings" | This item can be set even when selecting "Local Station" for the following module parameter: • "Required Settings" ⇨ "Station Type" ⇨ "Station Type" |
| | | CC-Link IE TSN module (RJ71GN11-T2) | "Application Settings" ⇨ "Master Station Shift Setting" | Newly added |
| | FX5CPU | | "Basic Settings" ⇨ "Communication Protocol Type" | "MC Protocol" can be selected when selecting "FX5-422-BD-GOT" for the following parameter: • "Basic Settings" ⇨ "Expansion Board" |
| | RnCPU RnENCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | "On Request" can be set for "Communication Setting." When setting any of the following devices for "Communication Destination," a bit device (F, TS, TC, STS, STC, CS, CC) and word device (TN, STN, CN) can be set: • Host Station • MELSEC iQ-R (built-in Ethernet) • MELSEC iQ-L (built-in Ethernet) • MELSEC iQ-F (built-in Ethernet) • MELSEC-Q (built-in Ethernet) • MELSEC-L (built-in Ethernet) • MELSEC-Q (Ethernet module) • MELSEC-L (Ethernet module) • SLMP-compatible device |
| | RnCPU RnENCPU RnPCPU RnSFCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | The following item name is changed. • Before change: Initial Communication Setting • After change: Initial Communication Setting (Enable Only When Communication Setting is Fixed Interval) |

Version 1.110Q

All CPUs: RCP, LHCPU, and FX5CPU

| Item | Module type | Description | Reference |
|--|-----------------------------|--|---|
| Start of GX Works3 | All CPUs | <ul style="list-style-type: none"> An important notification for GX Works3 appears at the start of GX Works3 when MELSOFT Update Manager Version 1.012N or later has been installed. | Page 47 Important notification message |
| Quick search | All CPUs | <ul style="list-style-type: none"> By searching with a function name of PX Developer, the similar function of GX Works3 can be displayed. | Page 79 Quick Search |
| Opening a GX Works2 format project | RCP LHCPU | <ul style="list-style-type: none"> Sample comments of a CPU module can be read when opening a GX Works2 format project. | Page 110 Opening a GX Works2 format project |
| Opening a PX Developer format project | RCP | <ul style="list-style-type: none"> Sample comments of a CPU module can be read when opening a PX Developer format project. | Page 113 Opening a PX Developer format project |
| Importing data | All CPUs | <p>The following data can be imported from an XML file compliant with IEC61131-10:</p> <ul style="list-style-type: none"> POUs (program block, function block, function, program body, local label) Global label Structure Files (program file, FB file, FUN file) Folder | <p>Page 138 Importing data (IEC61131-10 XML format)</p> <p>Page 969 XML File Formats (IEC61131-10 Format)</p> |
| Label editor | All CPUs | <ul style="list-style-type: none"> A label comment can be edited in a global label editor of a module label (M+Global). | Page 259 Editing module labels |
| Ladder editor | All CPUs | <p>The color of the following item can be changed in the "Color and Font" screen:</p> <ul style="list-style-type: none"> Background of Collapsed Ladder | — |
| FBD/LD editor | All CPUs | <p>The following operations can be performed in a batch for all FBD/LD editors in a project:</p> <ul style="list-style-type: none"> Linking comments in a batch Correcting the layout in an FBD network block in a batch Deleting a blank row between FBD network blocks Aligning FBD network blocks to the left side in a batch | Page 346 Correcting the layout of all FBD/LD editors in a batch |
| Converted result | All CPUs | <ul style="list-style-type: none"> Converted programs can be listed. | Page 444 Displaying a converted result |
| CC-Link IE TSN configuration window ^{*3*4} | RCP LHCPU | <p>When using any of the following modules, station list information can be imported/exported by selecting [CC-Link IE TSN Configuration] ⇒ [Import/Export] ⇒ [Import Station List]/[Export Station List]:</p> <ul style="list-style-type: none"> CC-Link IE TSN module (RJ71GN11-T2, RJ71GN11-SX) CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) CC-Link IE TSN compatible motion modules (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW, RD78G4(S), RD78G8(S), RD78G16(S)) CC-Link IE TSN compatible motion modules (LD78G4(S), LD78G16(S)) | — |
| | RnCPU RnENCPU RnSFCPU | <p>In a project using a CC-Link IE TSN module (RJ71GN11-SX), the following functions are available:</p> <ul style="list-style-type: none"> Connected/disconnected module detection Parameter of a device station Command execution of device station IP address setting | |
| | | <p>In a project using a CC-Link IE TSN module (RJ71GN11-SX), network topology can be changed to a line/star connection by selecting the following menu:</p> <ul style="list-style-type: none"> [CC-Link IE TSN Configuration] ⇒ [Change Transmission Path Method] ⇒ [Line/Star] <p>In a project using a CC-Link IE TSN module (RJ71GN11-SX), the following item can be set for a device station:</p> <ul style="list-style-type: none"> Parameter Automatic Setting | |
| CC-Link IEF Basic configuration window ^{*3} | FX5UJCPU FX5SCPU | <ul style="list-style-type: none"> The number of stations that can be placed in this window is changed from 8 to 16. | — |
| Label comment window Cross reference | All CPUs | <ul style="list-style-type: none"> Cross reference information can be created by selecting and right-clicking a label in the "Label Comment" window, then selecting [Cross Reference] from the shortcut menu. The automatic synchronization of the cross reference function is available in the "Label Comment" window. | <p>Page 472 Displaying cross reference information</p> <p>Page 475 Automatic synchronization</p> |

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| Item | Module type | Description | Reference |
|----------------------------|--|---|--|
| Library | All CPUs | <ul style="list-style-type: none"> A library file can be created in a project whose security version is '2.' | Page 529 Security version of a project Page 722 Library operation |
| Simulation | RnCPU RnENCPU RnPCPU (process mode) | A project including the following module can be simulated: <ul style="list-style-type: none"> C intelligent function module (RD55UP12-V) | Page 994 Modules supported by GX Simulator3 |
| | RnCPU RnENCPU | <ul style="list-style-type: none"> A project can be simulated while "On Request" is set for "Communication Setting" of "Simple CPU Communication Setting." A project can be simulated while a bit device (F, TS, TC, STS, STC, CS, CC) and word device (TN, STN, CN) are set for "Simple CPU Communication Setting." | IMELSEC iQ-R Ethernet User's Manual (Application) |
| | | <ul style="list-style-type: none"> The number of data points of devices and labels that can be specified as a display target in a trend graph is extended in the realtime monitor function. | IMELSEC iQ-R Programmable Controller CPU Module User's Manual |
| | RnPCPU (redundant mode) | A project including either of the following modules can be simulated: <ul style="list-style-type: none"> C intelligent function module (redundant system) (RD55UP06-V(R), RD55UP12-V(R)) | Page 994 Modules supported by GX Simulator3 |
| | RnSF CPU | A project including the following module can be simulated: <ul style="list-style-type: none"> CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) | |
| | RnPSFCPU | The following function is available: <ul style="list-style-type: none"> Label memory read/write | Page 628 Reading/Writing the Label Memory Page 803 Reading/Writing the Label Memory |
| | FX5SCPU | A project including any of the following modules can be simulated: <ul style="list-style-type: none"> Programmable controller CPU (FX5S-30MR/DS, FX5S-30MT/DS, FX5S-30MT/DSS, FX5S-40MR/DS, FX5S-40MT/DS, FX5S-40MT/DSS, FX5S-60MR/DS, FX5S-60MT/DS, FX5S-60MT/DSS, FX5S-80MR/DS, FX5S-80MT/DS, FX5S-80MT/DSS) | Page 994 Modules supported by GX Simulator3 |
| Monitoring | All CPUs | A Zoom can be monitored by using the SFC auto-scroll function even when setting "Open Single in Project" or "Open Single in Block" for the following option: <ul style="list-style-type: none"> "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Display Format" ⇒ "Window Display Method" | Page 650 Displaying a Zoom during monitoring with the Auto-scroll |
| Offline monitor | RnCPU (R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnPCPU RnSF CPU FX5CPU | Whether the devices/labels being monitored are specified as a collection target in the following functions can be identified: <ul style="list-style-type: none"> Data logging function Recording function | Page 767 Display of a device/label not to be sampled Page 770 Display of a device/label not to be sampled |
| | RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) RnENCPU RnPCPU RnSF CPU FX5CPU | The following functions are available: <ul style="list-style-type: none"> Loop playback Changing the playback magnification | Page 774 Seek bar |
| CC-Link IE TSN diagnostics | All CPUs | The following modules can be diagnosed: <ul style="list-style-type: none"> Tension meter (LM7-1LG, LM7-2LG) Inverter (FR-D800-E) Energy measuring unit (EMU4-BD1A-MB, EMU4-HD1A-MB, EMU4-FD1-MB, EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB, EMU4-CNT-MB) | — |
| Option | All CPUs | The following options are added: <ul style="list-style-type: none"> "Program Editor" ⇒ "SFC Diagram Editor" ⇒ "Action/Transition" ⇒ "Operational Setting" ⇒ "Change the data name of Zoom simultaneously when changing the name of Action/Transition" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check Label with Array No. Omitted" "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "ST Program" ⇒ "Use Large Size String Connection" | — |
| | RnCPU RnENCPU RnSF CPU LH CPU | The following option is added: <ul style="list-style-type: none"> "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Include Completion of Transferring Program Memory in Write Completion" | |

Parameters

| Category | Module type | Module | Parameter ^{*3*4} | Description |
|-----------------------------------|-----------------------------|---|--|---|
| System parameter | RnCPU RnENCPU RnSFCPU | CC-Link IE TSN module (RJ71GN11-SX) | "Inter-module Synchronization Setting" ⇨ "Select Inter-module Synchronization Target Module" | Newly added |
| | | | "Inter-module Synchronization Setting" ⇨ "Inter-module Synchronization Master Setting" | Newly added |
| CPU parameter | RnPCPU | | "Redundant System Settings" ⇨ "Control System Start-up Setting at One System Error" | Newly added |
| | RnSFCPU | | "Operation Related Setting" ⇨ "Clock Related Setting" ⇨ "Setting to Adjust Clock for Daylight Saving Time" | Newly added |
| | FX5UJCPU FX5SCPU | | "PID Control Setting" | Newly added |
| | FX5UCPU FX5UCCPU | | "PID Control Setting" ⇨ "Heating/Cooling PID Control Setting" ⇨ "Application Settings" ⇨ "Control Responses Parameter" | Newly added |
| Module parameter | RCPU LHCPU | | "Application Settings" ⇨ "Simple CPU Communication Setting" ⇨ "<Detailed Setting>" | "Import/Export of Settings" is added. |
| | RCPU | High speed data communication module (RD81DC96) | "Basic Settings" ⇨ "Various Operations Settings" ⇨ "Startup Self-Diagnostic Settings" | Newly added |
| Module parameter (CC-Link IE TSN) | RnCPU RnENCPU RnSFCPU | CC-Link IE TSN module (RJ71GN11-SX) | "Required Settings" ⇨ "Parameter Setting Method" ⇨ "Setting Method of Basic/ Application Settings" | "Program" can be selected. |
| | | | "Basic Settings" ⇨ "Network Topology" ⇨ "Network Topology" | "Line/Star" can be selected. |
| | | | "Basic Settings" ⇨ "Connection Device Information" ⇨ "CC-Link IE TSN Class Setting" | "Mixture of CC-Link IE TSN Class B/A or CC-Link IE TSN Class A Only" can be selected. |
| | RnSFCPU | CC-Link IE TSN Plus master/local module (RJ71GN11-EIP(T+E)) | "Basic Settings" ⇨ "Safety Communication Setting" | Newly added |
| | | CC-Link IE TSN module (RJ71GN11-SX) | "Basic Settings" ⇨ "Safety Communication Setting" | Newly added |

*1 To use this function, it is required that MELSOFT Navigator supports the function. For information on the versions of supporting MELSOFT Navigator, refer to MELSOFT Navigator Help.

*2 To use this function, it is required that MELSOFT Navigator supports the function. For information on the versions of supporting MELSOFT Navigator, refer to following:

📖 Let's start MELSOFT iQ Works Version 2

*3 To use this function, it is required that the firmware of a CPU module supports the function. For information on the firmware versions, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-R Ethernet User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

*4 To use this function, it is required that the firmware of a module supports the function. For information on the firmware versions, refer to the manual of the module.

*5 To use this function, it is required that the firmware of a module supports the function. For information on the firmware versions, refer to the following:

📖 iQ Sensor Solution Reference Manual

Modules

| Supported version | Series | Module name | Model name |
|-------------------|-------------|---|--|
| Version 1.005F | MELSEC iQ-R | Ethernet interface module | RJ71EN71 (E+CCIEC), RJ71EN71 (CCIEC) |
| Version 1.007H | MELSEC iQ-R | RCPU | R08PCPU, R16PCPU, R32PCPU, R120PCPU |
| | | Power supply module | R62P, R64P |
| | | C Controller | R12CCPU-V |
| | | Channel isolated RTD input module | R60RD8-G |
| | | Channel isolated thermocouple input module | R60TD8-G |
| | | Channel isolated analog input module | R60AD8-G, R60AD16-G |
| | | Channel isolated digital-analog converter modules | R60DA8-G, R60DA16-G |
| | MELSEC iQ-F | FX5CPU | FX5UCPU, FX5UCCPU |
| Version 1.010L | MELSEC-Q | MELSECNET/H network module | QJ71LP21 (-25 S-25 G GE), QJ71BR11, QJ71NT11B |
| Version 1.015R | MELSEC iQ-R | RCPU | R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, R120ENCPU |
| | | | R08SFCPU, R16SFCPU, R32SFCPU, R120SFCPU |
| | | Safety function module | R6SFM |
| | | CC-Link IE Field Network module | RJ71GF11-T2 |
| | | MES interface module | RD81MES96 |
| | | Temperature control module | R60TCTRT2TT2, R60TCTRT2TT2BW, R60TCRT4, R60RCRT4BW |
| Version 1.019V | MELSEC iQ-F | FX5CPU | FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS |
| | | Input module | FX5-C16EX/D, FX5-C16EX/DS |
| | | Output module | FX5-C16EYT/D, FX5-C16EYT/DSS |
| | | Extension power supply module | FX5-C1PS-5V |
| Version 1.020W | MELSEC iQ-R | Main base unit | R310B-HT |
| | | Extension base unit | R610B-HT |
| | | High speed data logger module | RD81DL96 |
| | | Transistor high-speed output module | RY41NT2H, RY41PT2H |
| | | High-Speed analog input module | R60ADH4 |
| | | Simple motion module | RD77GF4, RD77GF8, RD77GF16 |
| | | Motion CPU | R64MTCPU |
| | | C intelligent function module | RD55UP06-V |
| Version 1.025B | MELSEC iQ-R | Redundant function module | R6RFM |
| | | Main base unit | R310RB, R38RB-HT |
| | | Extension base unit | R610RB, R68RB-HT |
| | | Power supply module | R64RP |
| | | CC-Link IE Controller Network module | RJ71GP21-SX (R) |
| | | CC-Link IE Field Network module | RJ71GF11-T2 (MR), RJ71GF11-T2 (SR), RJ71GF11-T2 (LR) |
| | | CC-Link IE Field Network remote head module | RJ72GF15-T2, RJ72GF15-T2 (SR), RJ72GF15-T2 (LR) |
| | | DC high-speed input module | RX41C6HS, RX61C6HS |
| | | Input module with diagnostic functions | RX40NC6B |
| | | Output module with diagnostic functions | RY40PT5B |
| | | AnyWireASLINK master module | RJ51AW12AL |
| | | NCCPU | R16NCCPU |
| | | Dual signal module | R173SXY |
| | MELSEC iQ-F | FX5CPU | FX5U-32MR/DS, FX5U-32MT/DS, FX5U-32MT/DSS |
| | | CC-Link IE Field Network module | FX5-CCLIEF |
| | | I/O module | FX5-32ER/DS, FX5-32ET/DS, FX5-32ET/DSS |
| | | High speed pulse I/O module | FX5-16ET/ES-H, FX5-16ET/ESS-H |

| Supported version | Series | Module name | Model name |
|-------------------|-------------------------|---|--|
| Version 1.030G | MELSEC iQ-R | Power supply module | R63RP |
| | | Triac output module | RY20S6 |
| | | Flexible high-speed I/O control module | RD40PD01 |
| | | Simple motion module | RD77GF32 |
| | MELSEC iQ-F | FX5CPU | FX5U-64MR/DS, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-80MR/DS, FX5U-80MT/DS, FX5U-80MT/DSS |
| | | I/O module | FX5-16ER/ES, FX5-16ET/ES, FX5-16ET/ESS |
| | | RTD input adapter | FX5-4AD-PT-ADP |
| | | Thermocouple input adapter | FX5-4AD-TC-ADP |
| | | Simple motion module | FX5-80SSC-S |
| Version 1.032J | MELSEC iQ-R | AC input module | RX28 |
| | | Contact output module | RY18R2A |
| | | High-speed analog output module | R60DAH4 |
| | | Extension cable | RC100B |
| Version 1.035M | MELSEC iQ-R | Robot CPU | R16RTCPU |
| | | OPC UA server module | RD81OPC96 |
| | | BACnet interface module | RJ71BAC96 |
| | MELSEC iQ-F | FX5CPU | FX5UC-32MT/DS-TS, FX5UC-32MT/DSS-TS |
| | | Input module | FX5-C32EX/DS-TS |
| | | Output module | FX5-C32EYT/D-TS, FX5-C32EYT/DSS-TS |
| | | I/O module | FX5-C32ET/DS-TS, FX5-C32ET/DSS-TS |
| | | Multiple input module | FX5-8AD |
| | | Temperature control module | FX5-4LC |
| | | Positioning module | FX5-20PG-P |
| | | CC-Link system master/intelligent device module | FX5-CCL-MS |
| | | AnyWireASLINK master module | FX5-ASL-M |
| Version 1.038Q | MELSEC iQ-R | CANopen module | RJ71CN91 |
| Version 1.040S | MELSEC iQ-R | RCPU | R00CPU, R01CPU, R02CPU, R08PSFCPU, R16PSFCPU, R32PSFCPU, R120PSFCPU |
| | | SIL2 function module | R6PSFM |
| | | Input module with diagnostic functions | RX40NC6B (S2M), RX40NC6B (S2S) |
| | | Output module with diagnostic functions | RY40PT5B (S2M), RY40PT5B (S2S) |
| | MELSEC-Q | MES interface module | QJ71MES96N |
| | MELSEC iQ-F | Analog input module | FX5-4AD |
| | | Analog output module | FX5-4DA |
| Version 1.045X | MELSEC iQ-R | PROFIBUS interface module | RJ71PB91V (S) |
| | | Input module | RX70C4, RX71C4, RX72C4, RX10-TS, RX40C7-TS, RX41C4-TS |
| | | Output module | RY40PT5B-AS, RY10R2-TS, RY40NT5P-TS, RY40PT5P-TS, RY41NT2P-TS, RY41PT1P-TS |
| | | CC-Link IE Controller Network module | RJ71GP21S-SX, RJ71GP21S-SX (R) |
| | | Channel isolated analog input module | R60AD8-G (S2M), R60AD8-G (S2S) |
| | | Channel isolated digital-analog converter modules | R60DA8-G (S2M) |
| | MELSEC iQ-R MELSEC-Q | DeviceNet master/slave module | RJ71DN91, QJ71DN91 |

| Supported version | Series | Module name | Model name |
|-------------------|-------------|--|--|
| Version 1.050C | MELSEC iQ-R | Main base unit | R33B |
| | | Channel isolated pulse input module | RD60P8-G, RD60P8-G (Q) |
| | | HART communication analog input module | R60ADI8-HA |
| | | Energy measuring module | RE81WH |
| | MELSEC iQ-F | FX5CPU | FX5UC-32MR/DS-TS |
| | | Output module | FX5-C16EYR/D-TS |
| | | Positioning module | FX5-20PG-D |
| | | Ethernet interface module | FX5-ENET, FX5-ENET/IP |
| | | PROFIBUS interface module | FX5-DP-M |
| Version 1.055H | MELSEC iQ-R | CC-Link IE TSN module | RJ71GN11-T2 |
| Version 1.056J | MELSEC iQ-R | CC-Link IE TSN compatible motion module | RD78G4, RD78G8, RD78G16, RD78G32, RD78G64 |
| Version 1.060N | MELSEC iQ-L | LHCPU | L04HCPU, L08HCPU, L16HCPU |
| | MELSEC-L | CC-Link module | LJ61BT11 |
| | | Input module | LX10, LX28, LX40C6, LX41C4, LX42C4 |
| | | Output module | LY10R2, LY18R2A, LY20S6, LY28S1A, LY40NT5P, LY41NT1P, LY42NT1P, LY40PT5P, LY41PT1P, LY42PT1P |
| | | I/O module | LH42C4NT1P, LH42C4PT1P |
| | | Analog input module | L60AD4, L60ADVL8, L60ADIL8, L60AD4-2GH |
| | | Analog output module | L60DA4, L60DAVL8, L60DAIL8 |
| | | Analog I/O module | L60AD2DA2 |
| | | Temperature input module | L60RD8 |
| | | Temperature control module | L60TCTT4, L60TCTT4BW, L60TCRT4, L60TCRT4BW |
| | | Multiple input module | L60MD4-G |
| | | High-speed counter module | LD62, LD62D |
| | | LD75 type positioning module | LD75P1, LD75P2, LD75P4, LD75D1, LD75D2, LD75D4 |
| | | Flexible high-speed I/O control module | LD40PD01 |
| | | Serial communication module | LJ71C24, LJ71C24-R2 |
| | | Simple motion module | LD77MS2, LD77MS4, LD77MS16 |
| | MELSEC iQ-R | MES interface module | RD81MES96N |
| | | Laser displacement sensor control module | R60MH112, R60MH112NA |
| | | CC-Link IE TSN compatible motion module | RD78GHV, RD78GHW |
| | MELSEC iQ-F | FX5CPU | FX5UJ-24MR/ES, FX5UJ-40MR/ES, FX5UJ-60MR/ES, FX5UJ-24MT/ES, FX5UJ-40MT/ES, FX5UJ-60MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MT/ESS, FX5UJ-60MT/ESS |
| | | Safety extension module | FX5-SF-8DI4, FX5-SF-MU4T5 |
| Version 1.063R | MELSEC iQ-R | MELSECNET/H network module | RJ71LP21-25, RJ71LP21-25(R) |
| Version 1.065T | MELSEC iQ-R | Recorder module | RD81RC96 |
| | | Channel isolated analog-digital converter module | R60AD6-DG, R60AD6-DG(Q) |
| | | EtherNet/IP module | RJ71EIP91 |
| | | C intelligent function module | RD55UP12-V |
| | MELSEC iQ-F | CC-Link IE TSN module | FX5-CCLGN-MS |
| Version 1.070Y | MELSEC iQ-R | Redundant extension base unit | R68WRB |
| Version 1.072A | MELSEC iQ-R | Camera recorder module | RD81RC96-CA |
| | | GP-IB interface module | RJ71GB91(M), RJ71GB91(S) |
| | | Redundant extension base unit | R66WRB-HT |
| | MELSEC iQ-F | CC-Link IE TSN compatible motion module (simple motion mode) | FX5-40SSC-G(S), FX5-80SSC-G(S) |
| Version 1.075D | MELSEC iQ-R | High speed data communication module | RD81DC96 |
| | | Temperature control module | R60TCTRT2TT2-TS, R60TCRT4-TS |
| | | CC-Link IE TSN compatible motion module (simple motion mode) | RD78G4(S), RD78G8(S), RD78G16(S) |
| | MELSEC iQ-F | Analog Input/output adaptor | FX5-4A-ADP |

| Supported version | Series | Module name | Model name |
|-------------------|-------------|--|--|
| Version 1.077F | MELSEC iQ-F | OPC UA module | FX5-OPC |
| Version 1.080J | MELSEC iQ-F | FX5CPU | FX5S-30MR/ES, FX5S-30MT/ES, FX5S-30MT/ESS, FX5S-40MR/ES, FX5S-40MT/ES, FX5S-40MT/ESS, FX5S-60MR/ES, FX5S-60MT/ES, FX5S-60MT/ESS, FX5S-80MR/ES, FX5S-80MT/ES, FX5S-80MT/ESS |
| Version 1.082L | MELSEC iQ-R | MELSECWinCPU | R102WCPU-W |
| | | CC-Link IE TSN Plus master/local module | RJ71GN11-EIP(T+E) |
| | MELSEC-L | AnyWireASLINK master module | LJ51AW12AL |
| Version 1.090U | MELSEC iQ-L | LHCPU | L32HCPU |
| | | CC-Link IE TSN compatible motion module (simple motion mode) | LD78G4(S), LD78G16(S) |
| Version 1.095Z | MELSEC iQ-R | MELSECNET/H network module | RJ71BR11 |
| | | CC-Link IE TSN module | RJ71GN11-SX |
| | | Power supply module | R69P, R69RP |
| | MELSEC-L | CC-Link IE Field Network master/local module | LJ71GF11-T2 |
| | | Ethernet interface module | LJ71E71-100 |
| | MELSEC iQ-F | FX5CPU | FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, FX5UJ-60MT/DSS |
| Version 1.100E | MELSEC iQ-R | Input module with safety functions | RX40NC6S-TS |
| | | Output module with safety functions | RY48PT20S-TS |
| | MELSEC iQ-F | High-speed counter module | FX5-2HC/ES |
| Version 1.105K | MELSEC iQ-R | C intelligent function module (redundant system) | RD55UP06-V(R), RD55UP12-V(R) |
| | MELSEC iQ-F | FX5CPU | FX5S-30MR/DS, FX5S-30MT/DS, FX5S-30MT/DSS, FX5S-40MR/DS, FX5S-40MT/DS, FX5S-40MT/DSS, FX5S-60MR/DS, FX5S-60MT/DS, FX5S-60MT/DSS, FX5S-80MR/DS, FX5S-80MT/DS, FX5S-80MT/DSS |
| Version 1.110Q | MELSEC iQ-R | Main base unit | R32SB, R33SB, R35SB |
| | | Power supply module | R61SP |

Precautions

If a module profile is not registered in GX Works3, a project including the module cannot be opened, verified with another project, or read from a CPU module.

Appendix 2 Using a Project in a Different Version

This section explains the considerations for using a project in a different version of GX Works3 from the one with which the project was created.

Note the following contents to use a project.

Considerations common to all versions

■CPU module type

| Function | Consideration |
|--|--|
| Opening a project Writing data to a programmable controller Reading data from a programmable controller Project verification Verifying data with a programmable controller | These functions cannot be used in GX Works3 which does not support the CPU module type in use. |

■Parameters

| Function | Consideration | Reference |
|--|--|---|
| Opening a project Reading data from a programmable controller | When a project which was created in a later version is opened in an earlier version or is read from a CPU module, the parameters which cannot be used in the earlier version will be deleted or return to the default. | — |
| Project verification | When a project for which parameter items added in the later version are set is verified with another project created in an earlier version, the parameters will not be verified. | |
| | When projects created in different versions are verified with each other, module parameters may not match. | Page 152 Unmatched module parameters |
| Verifying data with a programmable controller | When data for which parameter items added in the later version are set is verified with another data created in an earlier version, the parameters may not be verified. | — |
| | When data is verified with that created in a different version, module parameters may not match. | Page 616 Unmatched module parameters |

■Instructions

| Function | Consideration |
|--|---|
| Reading data from a programmable controller Project verification Verifying data with a programmable controller | When an instruction, which is not supported in an earlier version, is used in a project in a later version, the project may not be verified or read from a CPU module in the earlier version. |
| Conversion | An error may occur when a program including an instruction supported by an earlier version is converted in a later version. |

■Process control function blocks

| Function | Consideration |
|---|--|
| Opening a project Reading data from a programmable controller | A process control function block may be updated for addition/improvement in the function when the version of GX Works3 is upgraded. If a project is created in an earlier version of GX Works3, a function block in the project may also be created in the earlier version. When opening the project in a later version or reading it from a programmable controller, a message that recommends to update the version of process control function block may appear. In this case, check the considerations and update the version of process control function block. (Page 260 Registering Tag FBs) Changing the process control program without update may cause an unintended operation. For additions and changes in a process control function block with a version upgrade, refer to 'Version Upgrade' in the following manual: MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions) |
| Opening a project Reading data from a programmable controller Project verification Verifying data with a programmable controller | When a function block, which is not supported in an earlier version, is used in a project in a later version, the project may not be opened, verified, or read from a CPU module in the earlier version. |

Using a project in a later version

■Using a project, which was created in version 1.010L, in version 1.015R or later

| Function | Consideration |
|-------------------|---|
| Library operation | <p>Even if libraries that contain global labels created in version 1.010L are registered in the library list in version 1.015R or later, the global labels are not displayed in the [Library] tab in the element selection window.</p> <p>A global label called by a utilized element will be changed to an undefined label without being utilized.</p> |

■Using a project, which was created in version 1.011M or earlier, in version 1.015R or later

| Function | Consideration |
|---|---|
| Option setting | <p>The following option will be set to "No" when a project, which was created in version 1.011M or earlier, is opened/read in version 1.015R or later.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimize the Number of Steps" (In version 1.015R to 1.050C) [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize the Number of Steps" (In version 1.052E or later) <p>Therefore, the verification result is inconsistent due to the difference of the option setting.</p> |
| Verifying data with a programmable controller | A verification result may mismatch when verifying a project, which was created in version 1.011M or earlier, against the global label setting in a CPU module. In this case, re-read/re-write the data from/to the CPU module, and then verify them again. |

■Using a project, which was created in version 1.027D or earlier, in version 1.030G or later

| Function | Consideration |
|----------------|---|
| Option setting | <p>The following option will be set to "No" when a project, which was created in version 1.027D or earlier, is opened/read in version 1.030G or later.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the data type of instruction argument" |

■Using a project, which was created in version 1.027D or earlier, in version 1.050C or later

| Function | Consideration |
|----------------|--|
| Option setting | <p>The following option will be set to "Do Not Check Only BMOV(P)/FMOV(P)" when a project, which was created in version 1.027D or earlier, is opened/read in version 1.050C or later.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the data type of instruction argument" |

■Using a project, which was created in version 1.033K or earlier, in version 1.035M or later

| Function | Consideration |
|-------------------------|--|
| Option setting | <p>The following option will be set to "No" when a project, which was created in version 1.033K or earlier, is opened/read in version 1.035M or later.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Use MC/MCR to Control EN" |
| Option setting (FX5CPU) | <p>The following option will be set to "No" when a project, which was created in version 1.033K or earlier, is opened/read in version 1.035M or later.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Collectively Allocate Temporary Area to Optimize the Number of Steps" (In version 1.035M to 1.050C) [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Collectively Allocate Temporary Area to Optimize the Number of Steps" (In version 1.052E or later) |

■Using a project, which was created in version 1.036N or earlier, in version 1.038Q or later

| Function | Consideration |
|----------------|--|
| Option setting | <p>The following option will be set to "No" when a project, which was created in version 1.036N or earlier, is opened/read in version 1.038Q or later.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Set Reserved Area" |

■Using a project, which was created in version 1.054G or earlier, in version 1.055H or later

| Function | Consideration |
|----------------|--|
| Option setting | <p>The following option will be set to "No" when a project, which was created in version 1.054G or earlier, is opened/read in version 1.055H or later.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Structured Data Type" ⇒ "Enable to Set Reserved Area" |
| Shortcut key | <p>A shortcut key assigned to the following menu will be assigned to [Online] ⇒ [FB Property Management (Online)] when the shortcut key settings, which was exported in version 1.054G or earlier, is imported in version 1.055H or later.</p> <ul style="list-style-type: none"> [Online] ⇒ [FB Property] ⇒ [FB Property Management] <p>A shortcut key assigned to the following menu is discarded.</p> <ul style="list-style-type: none"> [Online] ⇒ [FB Property] ⇒ [Update the Initial Value of FB Property] |

■Using a project, which was created in version 1.072A or earlier, in version 1.075D or later

| Function | Consideration |
|---|--|
| Opening a project | <p>An error may occur when changing the module type/operation mode or when checking parameters if a project satisfying all the following conditions, which was created in version 1.072A or earlier, is opened in version 1.075D or later.</p> <ul style="list-style-type: none"> • A serial communication module (LJ71C24 or LJ71C24-R2) is placed. • "Interrupt Settings" in the module parameters for a serial communication module (LJ71C24 or LJ71C24-R2) are configured. <p>In this case, delete the serial communication module (LJ71C24 or LJ71C24-R2) after opening the project, then add the same module again.</p> <p>In addition, set the module parameters to be the same as the ones before deletion of the module.</p> |
| Project verification Verifying data with a programmable controller | <p>"Interrupt Settings" in the module parameters may not match when a project satisfying all the following conditions, which was created in version 1.072A or earlier, is verified with a project created in version 1.075D or later.</p> <ul style="list-style-type: none"> • A serial communication module (LJ71C24 or LJ71C24-R2) is placed. • "Interrupt Settings" in the module parameters for a serial communication module (LJ71C24 or LJ71C24-R2) are configured. <p>In this case, delete the serial communication module (LJ71C24 or LJ71C24-R2) after opening the project, then add the same module again.</p> <p>In addition, set the module parameters to be the same as the ones before deletion of the module.</p> <p>Then, verify the projects again.</p> |

■Using a project, which was created in version 1.082L or earlier, in version 1.085P or later

| Function | Consideration |
|---|---|
| Writing data to a programmable controller | <p>An error occurs when editing or checking parameters if a project satisfying all the following conditions, which was created in version 1.082L or earlier, is opened in version 1.085P or later.</p> <ul style="list-style-type: none"> • A CC-Link IE TSN compatible motion module is placed. • A value less than 14 us is set for "Transient Transmission Time" in the module parameters for a CC-Link IE TSN compatible motion module. |

■Using a project, which was created in version 1.090U or earlier, in version 1.095Z or later

| Function | Consideration |
|--|--|
| Opening a project Reading data from a programmable controller | <p>The following parameter will be set to "1" when a project for an RnSFCPU, which was created in version 1.090U or earlier, is opened or read from a CPU module in version 1.095Z or later:</p> <ul style="list-style-type: none"> • In "Safety Communication Setting" for a CC-Link IE Field Network module (RJ71GF11-T2), "Safety Protocol Version" of a row that has been set in version 1.090U or earlier. <p>An error occurs when any of the following projects, which were created in version 1.090U or earlier, is opened and the [Check] button or [Apply] button is clicked in the "Module Parameter" screen.</p> <ul style="list-style-type: none"> • A project in which "Maximum No. of Transient Transmissions" of the module parameter for a MELSECNET/H network module (QJLP21(-25 S-25 G GE), QJBR11, QJ71NT11B, RJ71LP21-25, or RJ71LP21-25(R)) is blank. • A project in which "Maximum No. of Transients in One Station" of the module parameter for a MELSECNET/H network modules (QJLP21(-25 S-25 G GE), QJBR11, QJ71NT11B, RJ71LP21-25, or RJ71LP21-25(R)) is not blank. • A project in which a value that exceeds "Maximum No. of Transient Transmissions" is set for "Maximum No. of Transients in One Station" of the module parameter for a MELSECNET/H network modules (QJLP21(-25 S-25 G GE), QJBR11, QJ71NT11B, RJ71LP21-25, or RJ71LP21-25(R)). |

Using a project in an earlier version

■Using a project, which was created in version 1.005F or later, in version 1.002C or earlier

| Function | Consideration |
|---|---|
| Reading data from a programmable controller | A project, which was created in version 1.005F or later, cannot be read in version 1.002C or earlier. |

■Using a project, which was created in version 1.007H or later, in version 1.006G or earlier

| Function | Consideration |
|--|---|
| Opening a project Reading data from a programmable controller | A project that contains an FBD/LD program cannot be opened/read in version 1.006G or earlier. |

■Using a project, which was created in version 1.010L or later, in version 1.008J or earlier

| Function | Consideration |
|-------------------|--|
| Library operation | <p>An edit-protected FBD/LD element is editable by opening it in version 1.008J. (Worksheet only)</p> <p>An element is not editable when an edit-protected ST program is opened and copied in version 1.008J or earlier. To make the element editable, open the project that contains the copied data in version 1.010L or later, and copy it again.</p> <p>When an edit-protected element is opened and copied in version 1.008J or earlier, then it is reopened in version 1.010L or later, the icon of the copied data (element) may indicate that the element is still edit-protected.</p> |

■Using a project, which was created in version 1.015R or later, in version 1.010L or earlier

| Function | Consideration |
|-------------------|--|
| Library operation | A read-protected element, which was utilized from a library, is identified as an element with a block password when it is opened in version 1.010L or earlier. Therefore, the element cannot be detected and the name cannot be changed. |

■Using a project, which was created in version 1.015R or later, in version 1.011M or earlier

| Function | Consideration |
|--|---|
| Opening a project Reading data from a programmable controller | A project that contains an SFC program cannot be opened/read in version 1.011M or earlier. |
| Option setting | <p>A project that "Yes" has been selected for the following option cannot be opened/read in version 1.011M or earlier. In addition, a project that "Yes" has been selected for the following option cannot be verified with one created in version 1.011M or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimize the Number of Steps" (In version 1.015R to 1.050C) • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize the Number of Steps" (In version 1.052E or later) |
| Program file setting | When a project that the execution order has been set is opened and converted in version 1.011M or earlier, the order is changed to the program block name order. |
| Library operation | <p>Even if libraries that contain global labels are registered in the library list in version 1.010L, the global labels are not displayed in the [Library] tab in the element selection window. In addition, global labels called by utilized elements will be changed to undefined labels without being utilized.</p> <p>Libraries that contain a read-protected element can be registered in the library list in version 1.011M or earlier, but they cannot be used.</p> |

■Using a project, which was created in version 1.020W or later, in version 1.019V or earlier

| Function | Consideration |
|---|--|
| Opening a project Reading data from a programmable controller | When a project, for which multiple connection destinations have been set, is opened in version 1.019V or earlier, the destinations except for one which was set first are deleted. |
| | A project, in which an extended temperature range base unit (R310B-HT, R610B-HT) has been placed, cannot be opened/read in version 1.019V or earlier. |
| | A project that contains an SFC program including multiple steps cannot be opened/read in version 1.019V or earlier. |
| | A project that contains an SFC program including a jump may not be opened/read in version 1.019V or earlier. |
| Project verification Verifying data with a programmable controller | CPU parameters of a project for an RnCPU or an RnENCPU cannot be verified with data in another project in version 1.019V or earlier. |
| | CPU parameters of a project, for which the daylight saving time setting is enabled, cannot be verified against data in a programmable controller in version 1.019V or earlier. |
| | A project, in which an extended temperature range base unit (R310B-HT, R610B-HT) has been placed, cannot be verified in version 1.019V or earlier. |
| | A project that contains an SFC program including multiple steps cannot be verified in version 1.019V or earlier. |
| | A project that contains an SFC program including a jump may not be verified in version 1.019V or earlier. |
| Library operation | A project that contains an SFC program including multiple steps cannot be read in version 1.019V or earlier. |
| | A project that contains an SFC program including a jump may not be read in version 1.019V or earlier. |
| | Libraries that contain an element, for which the edit password has individually been set, can be registered in the library list in version 1.019V or earlier, but they cannot be used. |
| | A help file, for which "Import" has been selected at exporting, retains as the unused data in a project or a library when it is opened by version 1.019V or earlier. When it is reopened in version 1.020W or later after being saved in version 1.019V or earlier, the help file of the unused data is deleted. |
| Reading from an SD memory card | A project that contains an SFC program including multiple steps cannot be read in version 1.019V or earlier. |
| | A project that contains an SFC program including a jump may not be read in version 1.019V or earlier. |
| Editing an SFC program | An SFC program, which was created in GX Works3 version 1.020W or later, may run unstably if it is used in version 1.019V or earlier. When editing an SFC program, use version 1.020W or later. |

■Using a project, which was created in version 1.025B or later, in version 1.022Y or earlier

| Function | Consideration |
|---|--|
| Opening a project Reading data from a programmable controller | When a project, which was created in version 1.025B or later and set an RnPCPU (redundant mode) as the CPU module type, is opened in version 1.022Y or earlier, the CPU module type is changed to an RnPCPU (process mode). |
| | A project used for a remote head module cannot be opened/read in version 1.022Y or earlier. |
| | A project, in which some worksheets are created in a POU, cannot be opened in version 1.025B or earlier. |
| | A project, in which an AnyWireASLINK master module (RJ51AW12AL) has been placed, cannot be opened/read in version 1.022Y or earlier. |
| Project verification Verifying data with a programmable controller | A project used for an RnPCPU (redundant mode) cannot be verified in version 1.022Y or earlier. |
| | A project used for a remote head module cannot be verified in version 1.022Y or earlier. |
| | Parameters of a project, in which a redundant power supply base unit (R310RB, R38RB-HT, R610RB, R68RB-HT) has been placed and for which a power supply 2 has been set, cannot be verified in version 1.022Y or earlier. |
| | A project, in which an AnyWireASLINK master module (RJ51AW12AL) has been placed, cannot be verified in version 1.022Y or earlier. |
| Connection destination specification | Connection destination settings return to the default when the "Specify Connection Destination" screen is opened if the settings meet any of the following conditions: <ul style="list-style-type: none"> • "GOT" is selected for "PLC side I/F" and "CC IE Cont" is set in the "PLC side I/F Detailed Setting of GOT" screen. • "CC IE Control NET/10(H) Board" is set for "PC side I/F." • "CC-Link Board" is set for "PC side I/F." • "CC IE Field board" is set for "PC side I/F." |
| Library operation | Libraries that contain a module label/ structure cannot be used in version 1.022Y or earlier. |

■Using a project, which was created in version 1.030G or later, in version 1.027D or earlier

| Function | Consideration |
|---|---|
| Opening a project Reading data from a programmable controller | A project, in which a flexible high-speed I/O control module (RD40PD01) or triac output module (RY20S6) has been placed, cannot be opened/read in version 1.027D or earlier to which profiles have not been registered. |
| | A project, for which an AnyWireASLINK configuration has been set, cannot be opened/read in version 1.027D or earlier. |
| | When a data type other than Word [Unsigned]/Bit String [16-bit]/Word [Signed] is used for an argument of BMOV(P) instruction, an error occurs at the conversion in version 1.027D or earlier. |
| | An SFC program in MELSAP-L (instruction format) is displayed in the detailed expression of a ladder when it is opened in version 1.027D or earlier. |
| | A project, in which a redundant power supply module (R63RP) has been placed, cannot be opened in version 1.026C or earlier. |
| | When a project, in which a redundant power supply module (R63RP) has been placed, is opened in version 1.026C or earlier, the name of the power supply module is blank. |
| | When writing a project, in which safety global labels or safety/standard shared global labels are created in version 1.030G or later, to a programmable controller, the project cannot be read in version 1.027D or earlier. |
| Project verification Verifying data with a programmable controller | A project, in which a flexible high-speed I/O control module (RD40PD01) or triac output module (RY20S6) has been placed, cannot be verified in version 1.027D or earlier in which a profile to which profiles have not been registered. |
| | A project, for which an AnyWireASLINK configuration has been set, cannot be verified in version 1.027D or earlier. |
| | A project, in which a redundant power supply module (R63RP) has been placed, cannot be verified in version 1.027D or earlier. |
| | A project that parameters for CC-Link IE Field Network Basic have been set cannot be verified in version 1.027D or earlier. |
| Connection destination specification | Connection destination settings return to the default if the settings meet either of the following conditions: <ul style="list-style-type: none"> • "GOT" is selected for "PLC side I/F" and "CC IE Field" is set in the "PLC side I/F Detailed Setting of GOT" screen. • For a project which is used for an RnPCPU (redundant mode) and a remote head module, "GOT" is selected for "PLC side I/F" and "CC IE Cont" is set in the "PLC side I/F Detailed Setting of GOT" screen. |
| Register/cancel forced input/output | The current value of devices in a CPU module, in which forced input/output has been registered in version 1.030G or later, cannot be changed in version 1.027D or earlier. |

■Using a project, which was created in version 1.032J or later, in version 1.019V or earlier

| Function | Consideration |
|--|--|
| Reading data from a programmable controller Verifying data with a programmable controller | A project, in which a following module has been placed, cannot be read/verified in version 1.019V or earlier. <ul style="list-style-type: none"> • Analog output module (R60DA4, R60DA4(Q), R60DAI8, R60DAI8(Q), R60DAV8, R60DAV8(Q)) • Channel isolated digital-analog converter module (R60DA8-G, R60DA8-G(Q), R60DA16-G) • High-Speed analog input module (Q64ADH) |

■Using a project, which was created in version 1.032J or later, in version 1.031H or earlier

| Function | Consideration |
|---|---|
| Opening a project Reading data from a programmable controller | A project containing any of the following data cannot be used in version 1.031H or earlier. <ul style="list-style-type: none"> • Program file in which "Yes" is selected for "Use the process control extension" • Function block in which "Yes" is selected for "Use as Tag FB" • Process control function block • Data registered in a tag FB setting |
| | A project, in which an extension cable (RC100B) has been placed, cannot be opened/read in version 1.031H or earlier. |
| | A project, in which an analog output module (R60DAH4), an input module (RX28), and an output module (RY18R2A) have been placed, cannot be opened/read in version 1.031H or earlier to which profiles have not been registered. |
| | |
| Project verification Verifying data with a programmable controller | A project, in which an extension cable (RC100B) has been placed, cannot be verified in version 1.031H or earlier. |
| | A project, in which an analog output module (R60DAH4), an input module (RX28), and an output module (RY18R2A) has been placed, cannot be verified in version 1.031H or earlier to which profiles have not been registered. |

■Using a project, which was created in version 1.035M or later, in version 1.019V or earlier

| Function | Consideration |
|---|--|
| Reading data from a programmable controller | Module parameters of a project, in which a flexible high-speed I/O control module (RD40PD01) has been placed, cannot be read in version 1.019V or earlier. |
| Project verification Verifying data with a programmable controller | Module parameters of a project, in which a flexible high-speed I/O control module (RD40PD01) has been placed, cannot be verified in version 1.019V or earlier. |

■Using a project, which was created in version 1.035M or later, in version 1.033K or earlier

| Function | Consideration |
|---|---|
| Opening a project Reading data from a programmable controller | <p>A project, in which an OPC UA server module (RD81OPC96), BACnet module (RJ71BAC96), and a robot controller CPU (R16RTCPU) have been placed, cannot be opened/read in version 1.033K or earlier to which profiles have not been registered.</p> <p>When a project that saves the parameters of a device station is opened in version 1.033K or earlier, the parameters seem to be deleted even though the parameters are not deleted. By reopening the project in version 1.035M or later, the parameters of the device station can be used.</p> <p>Even if a project including unused function blocks and/or functions is read in version 1.033K or earlier, the function blocks and functions are not read.</p> |
| Option setting | <p>A project that "Yes" has been selected for the following option cannot be opened/read in version 1.033K or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Use MC/MCR to Control EN" |
| Project verification Verifying data with a programmable controller | <p>A project, in which an OPC UA server module (RD81OPC96), BACnet module (RJ71BAC96), and a robot controller CPU (R16RTCPU) have been placed, cannot be verified in version 1.033K or earlier to which profiles have not been registered.</p> |
| Configuration setting | <p>When a project that saves the parameters of a device station is opened in version 1.033K or earlier and the following operations are performed in the screen of CC-Link IE Field configuration setting, the saved parameter information will not be updated/deleted.</p> <ul style="list-style-type: none"> • Editing the CC IE Field configuration • Parameter processing of a device station • Deleting the parameter information of a device station <p>When the screen of the CC IE Field configuration setting is opened in version 1.035M or later after changing the station number of a device station in version 1.033K or earlier, the parameter information of the device station to which the station number was changed will be skipped and not read. By clicking the [Close with Reflecting the Setting] button in the state where the parameter information was skipped and not read, the information will be deleted.</p> |
| Conversion | <p>When a different data type is specified for the argument of an instruction by selecting "No" in the following option, an error occurs at the conversion in version 1.033K or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the data type of instruction argument" |

■Using a project, which was created in version 1.038Q or later, in version 1.036N or earlier

| Function | Consideration |
|---|--|
| Opening a project Reading data from a programmable controller | <p>A project that "Yes" has been set for the following option cannot be opened/read from a CPU module in version 1.036N or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Set Reserved Area" <p>A project including an element with the security key registered cannot be opened in version 1.036N or earlier. By deleting the security key registered to the element, the project can be opened in version 1.036N or earlier.</p> <p>A project, in which a CANopen module (RJ71CN91) has been placed, cannot be opened/read in version 1.036N or earlier to which profiles have not been registered.</p> |
| Project verification Verifying data with a programmable controller | <p>A project, in which a CANopen module (RJ71CN91) has been placed, cannot be verified in version 1.036N or earlier to which profiles have not been registered.</p> |
| Library operation | <p>Libraries of a project that "Yes" has been selected for the following option can be registered in the library list in version 1.036N or earlier, but they cannot be used.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Set Reserved Area" |

■Using a project, which was created in version 1.040S or later, in version 1.019V or earlier

| Function | Consideration |
|---|--|
| Reading data from a programmable controller | <p>Module parameters of a project, in which a high-speed analog input module (R60ADH4) has been placed, cannot be read in version 1.019V or earlier.</p> |
| Project verification Verifying data with a programmable controller | <p>Module parameters of a project, in which a high-speed analog input module (R60ADH4) has been placed, cannot be verified in version 1.019V or earlier.</p> |

■Using a project, which was created in version 1.040S or later, in version 1.038Q or earlier

| Function | Consideration |
|---|--|
| Opening a project Reading data from a programmable controller | <p>The setting of extended file registers (ER) in a project for an FX5CPU will be cleared when the project is opened in version 1.038Q or earlier.</p> <p>A message appears when opening the Device Memory editor. The Device Memory editor will not open by clicking the [OK] button on the message. Therefore, retry opening the device memory editor.</p> <p>A project, in which a SIL2 function module (R6PSFM) has been placed, cannot be opened/read in version 1.038Q or earlier.</p> <p>A project, in which an MES interface module (QJ71MES96N), an input module with diagnostic functions (RX40NC6B(S2M), RX40NC6B(S2S)), and an output module with diagnostic functions (RY40PT5B(S2M), RY40PT5B(S2S)) has been placed, cannot be opened/read in version 1.038Q or earlier to which profiles have not been registered.</p> <p>When printing FBD/LD programs, the paper size and the paper feed direction depend on the page setting.</p> <p>When a project for which the following items have been changed in the FBD/LD or SFC editor in opened in version 1.038Q or earlier, the changes will not be applied.</p> <ul style="list-style-type: none"> • Background color of an editor • Background color of a comment element • Font color of a comment element <p>Note that the font colors set for each comment element will remain in version 1.038Q or earlier.</p> |
| Project verification Verifying data with a programmable controller | <p>A project for an RnPCPU cannot be verified with another project in version 1.038Q or earlier.</p> <p>Module parameters of an RnPCPU to which a project that the FTP client has been set is written cannot be verified in version 1.038Q or earlier.</p> <p>A project, in which a SIL2 function module (R6PSFM) has been placed, cannot be verified in version 1.038Q or earlier.</p> <p>A project, in which an MES interface module (QJ71MES96N), an input module with diagnostic functions (RX40NC6B(S2M), RX40NC6B(S2S)), and an output module with diagnostic functions (RY40PT5B(S2M), RY40PT5B(S2S)) has been placed, cannot be verified in version 1.038Q or earlier to which profiles have not been registered.</p> |
| Connection destination specification | <p>Connection destination settings return to the default when the "Specify Connection Destination" screen is opened if the settings meet the following condition:</p> <ul style="list-style-type: none"> • "Ethernet board" is set for "PC side I/F," and "via GOT (Ethernet) transparent mode" is set in the "PLC side I/F Detailed Setting of GOT" screen. |

■Using a project, which was created in version 1.045X or later, in version 1.044W or earlier

| Function | Consideration |
|---|---|
| Opening a project Reading data from a programmable controller | <p>The following projects that are created in version 1.045X or later cannot be opened and read from a CPU module in version 1.044W or earlier.</p> <ul style="list-style-type: none"> • A project using a read-protected POU whose password authentication is disabled. • A project to which a user with the access level of "Assistant Developers" is registered. |
| Project verification Verifying data with a programmable controller | <p>The following projects that are created in version 1.045X or later cannot be verified with another project in version 1.044W or earlier.</p> <ul style="list-style-type: none"> • A project using a read-protected POU whose password authentication is disabled. • A project to which a user with the access level of "Assistant Developers" is registered. <p>When a project for an RnCPU or an RnENCPU, which was created in version 1.045X or later and in which any one of the following parameters has been set, is verified with another project in version 1.044W or earlier, the parameters of the CPU module will not be verified.</p> <ul style="list-style-type: none"> • Web Server Settings • Battery-less Option Cassette Setting • Simple CPU Communication Setting |
| Opening a simulation environment file | A simulation environment file saved in version 1.045X or later cannot be opened in version 1.044W or earlier. |
| Connection destination specification | When a project, in which a connection destination routing a QCPU (Q mode) is specified, is opened in version 1.044W or earlier, only the setting of this connection destination returns to the default. |
| Library operation | When a password authentication for a read-protected POU is disabled in version 1.045X or later, a library including the POU cannot be used in version 1.044W or earlier. |
| User authentication | When reading user information whose access level is set as "Assistant Developers" in version 1.045X or later from a CPU module using version 1.044W or earlier, the access level is changed to "Users." (Page 714 Reading user information from a CPU module) |

■Using a project, which was created in version 1.047Z or later, in version 1.045X or earlier

| Function | Consideration |
|---|--|
| Reading data from a programmable controller | When reading a project including unused structures in version 1.045X or earlier, the structures cannot be read. |
| Verifying data with a programmable controller | A project including unused structures cannot be verified against data in a programmable controller in version 1.045X or earlier. |
| Conversion | When a program including an instruction to which "_M2" is added, an error occurs at the conversion in version 1.045X or earlier. |

■Using a project, which was created in version 1.050C or later, in version 1.047Z or earlier

| Function | Consideration |
|--|--|
| Opening a project Reading data from a programmable controller | <p>A project, for which "Compression" is selected for "File Size" in the "Properties" screen cannot be opened in version 1.047Z or earlier.</p> <p>Regardless of the setting of the following option, a project in which data exists after 481th or later rows on the tag FB setting editor cannot be opened or read from a CPU module in version 1.047Z or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "Maximum Number of Tags" <p>A project in which the value of the following option is set to 481 or higher cannot be opened or read from a CPU module in version 1.047Z or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "Maximum Number of Tags" |
| Reading data from a programmable controller | When a project, in which a main base unit (R33B) has been placed, is read from a CPU module in version 1.047Z or earlier, the model name of this base unit is displayed blank in the "System Parameter" screen. |
| Project verification | A project, for which "Compression" is selected for "File Size" in the "Properties" screen cannot be verified in version 1.047Z or earlier. |
| Verifying data with a programmable controller | <p>When a project used for an RnPCPU (redundant mode) for which the following parameter is set is verified with another project which was created in version 1.047Z or earlier, the CPU parameters will not be verified.</p> <ul style="list-style-type: none"> • Setting to Wait Receiving Cyclic Data after Switching System <p>When a project for an RnCPU or an RnENCPU for which the following parameters are set is verified with another project which was created in version 1.047Z or earlier, the module parameters will not be verified.</p> <ul style="list-style-type: none"> • Communications by Network No./Station No. • Network/Station No. <-> IP information setting <p>When a project for an RnPCPU (redundant mode) for which a step relay (S) is set in the following parameter is verified with another project which was created in version 1.047Z or earlier, the module parameters will not be verified.</p> <ul style="list-style-type: none"> • Tracking Setting |
| Conversion | <p>When a ladder program including a function block or function whose definition is unclear is opened in version 1.047Z or earlier, the background color of the ladder block including the function block or function is displayed in yellow. In addition, an error occurs when this program is converted.</p> <p>When converting a project in version 1.047Z or earlier, an error will occur if "Do Not Check Only BMOV(P)/FMOV(P)" is selected for the following option and a data type different from the one defined to the argument of BMOV, BMOVP, FMOV, or FMOVP is specified.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the data type of instruction argument" |
| Reading from an SD memory card | An error occurs when a password is registered for a file in an SD memory card in version 1.050C or later and the file is read in version 1.047Z or earlier. |

■Using a project, which was created in version 1.052E or later, in version 1.050C or earlier

| Function | Consideration |
|----------------|--|
| Option setting | <p>A project in which its options are set as follows cannot be opened, verified, or read from the CPU module in version 1.050C or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize the Number of Steps": Yes • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize Level": Level 2 <p>Moreover, a project in the following conditions cannot be opened, verified, or read from a CPU module in version 1.011M or earlier: "Yes" is selected for "Optimize the Number of Steps" and also "Level 1" is selected for "Optimize Level."</p> |

■Using a project, which was created in version 1.055H or later, in version 1.050C or earlier

| Function | Consideration |
|----------------|--|
| Option setting | <p>A project where "Level 2" has been set for the following option may not be opened, verified, or read from a CPU module in version 1.050C or earlier. (☞ Page 916 Using a project, which was created in version 1.052E or later, in version 1.050C or earlier)</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize Level" <p>If both of the following conditions are satisfied, the default value for this option will be set to "Level 2" when creating a new project in version 1.055H or later.</p> <ul style="list-style-type: none"> • GX Works3 Version 1.052E to 1.054G which had been used or activated before has been updated to Version 1.055H or later. • The default value of "Optimization of Number of Steps" had never been changed in GX Works3 before its update. |

■Using a project, which was created in version 1.055H or later, in version 1.054G or earlier

| Function | Consideration |
|---|--|
| Opening a project Reading data from a programmable controller | <p>A project that "Yes" has been selected for the following option cannot be opened/read from a CPU module in version 1.054G or earlier.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Structured Data Type" ⇒ "Enable to Set Reserved Area" <p>A conversion error may occur when a project, where an element replaced automatically in opening another format project exists, is opened or read from a CPU module in version 1.054G or earlier.</p> <p>Input/output labels are displayed by their label names when a project that "Yes" has been selected for the following option is opened or read from a CPU module in version 1.054G or earlier.</p> <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Comment" ⇒ "Display Item" ⇒ "Switch FB/FUN Argument to Comment" <p>When a project where the width of an element in an FBD/LD program is set narrower than the default is opened in version 1.054G or earlier, its input/output label names may protrude from the element frame depending on the length. This can be fixed by re-pasting (cutting and pasting) the element.</p> |
| Reading data from a programmable controller | Parameters of a device station on CC-Link IE TSN which are written to a CPU module in version 1.055H or later cannot be read from the CPU module in version 1.054G or earlier. |
| Shortcut key | <p>A shortcut key assigned to the following menu will be assigned to [Online] ⇒ [FB Property] ⇒ [FB Property Management] when the shortcut key settings, which was exported in version 1.055H or later, is imported in version 1.054G or earlier.</p> <ul style="list-style-type: none"> • [Online] ⇒ [FB Property Management (Online)] |
| Project verification Verifying data with a programmable controller | When a project for which the size of an element has been changed in version 1.055H or later is verified with a project created in version 1.050C to 1.054G, the element is displayed as mismatched data in the "Verify Result" window; however, it is displayed as matched in the detailed display (diagram/table format) screen. |
| Verifying data with a programmable controller | When a program in which "Extended Mode (iQ-R Series Mode)" is selected for "Link Direct Device Setting" in the CPU parameters for an RnCPU or an RnENCPU, is verified with another project created in version 1.054G or earlier, the link direct device names of the verification destination will not be displayed properly in the detailed display tab. Therefore, "Mismatch" will be displayed in the verification result. |
| Connection destination specification | <p>When a project, in which a connection destination routing a QJ71E71-100 is specified, is opened in version 1.054G or earlier, only the setting of this connection destination returns to the default.</p> <p>Connection destination settings return to the default if a project, in which the settings meet either of the following conditions, is opened in version 1.054G or earlier:</p> <ul style="list-style-type: none"> • "Ethernet board" is selected for "PC side I/F," and an Ethernet adapter is set in the "PC side I/F Detailed Setting of Ethernet Board" screen. • An Ethernet adapter is set in the "CPU Module Direct Coupled Setting" screen. |
| Remote password | <p>Even if the settings of the following items in the remote password file of a CC-Link IE TSN module are changed in version 1.054G or earlier, the changed contents are discarded when the file is opened in version 1.055H or later.</p> <ul style="list-style-type: none"> • SLMP Transmission Port (TCP/IP) • SLMP Transmission Port (UDP/IP) |
| Library operation | <p>Libraries of a project that "Yes" has been selected for the following option can be registered in the library list in version 1.054G or earlier, but they cannot be used.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Structured Data Type" ⇒ "Enable to Set Reserved Area" <p>Libraries that contain a module FB cannot be used in version 1.054G or earlier.</p> |

■Using a project, which was created in version 1.060N or later, in version 1.055H or earlier

| Function | Consideration |
|----------------|---|
| Option setting | <p>A project for an FX5CPU cannot be opened, verified, or read from the CPU module in version 1.055H or earlier if its options are set as follows.</p> <ul style="list-style-type: none"> • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize the Number of Steps": Yes • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Collectively Allocate Temporary Area to Optimize the Number of Steps": Yes • [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Optimization of Number of Steps" ⇒ "Optimize Level": Level 2 <p>If both of the following conditions are satisfied, the default value of "Optimize Level" will be set to "Level 1" when creating a new project for an FX5CPU in version 1.060N or later.</p> <ul style="list-style-type: none"> • GX Works3 Version 1.055H to 1.058L which had been used or activated before is updated to Version 1.060N or later. • The default value of "Optimization of Number of Steps" had never been changed in GX Works3 before its update. |

■Using a project, which was created in version 1.060N or later, in version 1.058L or earlier

| Function | Consideration |
|--|---|
| Opening a project Reading data from a programmable controller | <p>When a project in which the display format (Word Multi-point Format) of device values in a device memory editor is set to "1 Point" is opened in version 1.058L or earlier, the display format will be changed as follows.</p> <ul style="list-style-type: none"> • Bit and Word Format of Bit Device: 10 Points • Word Multi-point Format: 8 Points |

| Function | Consideration |
|--------------------------|--|
| Project revision history | A project cannot be restored based on the revision registered with the following option set to "Yes" in version 1.058L or earlier. • "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Optimize Revision Information to Reduce File Size" |

■Using a project, which was created in version 1.065T or later, in version 1.063R or earlier

| Function | Consideration |
|--|---|
| Opening a project | When a project, in which a number other than 10 is set for the number of rows to be displayed in an inline structured text box in version 1.065T or later, is opened in version 1.063R or earlier, the number of the rows is changed to 10. When a project including an inline structured text program with 2049 characters or more, which is created in version 1.065T or later, is opened in version 1.063R or earlier, the program cannot be edited. (However, the program can be deleted and changed to the one with 2048 characters or less.) When copying and pasting an inline structured text box, an empty box will be pasted. |
| Opening a project Writing data to a programmable controller | When a project, in which a CC-Link IE TSN module is set to "Synchronize" in the "Select the Synchronous Target Module" screen, is opened in version 1.063R or earlier, the setting is displayed as "Do Not Synchronize." However, the CC-Link IE TSN module is actually set as a synchronous target. If this project is written to a CPU module, the CC-Link IE TSN module is written as a synchronous target. |
| Project version management (data acquisition) | A ladder program including an inline structured text program with 2049 characters or more, which is created in version 1.065T or later, cannot be acquired from a version management system in version 1.063R or earlier. |
| Reading data from a programmable controller | Parameters of a device station on CC-Link IE TSN which are written to an FX5UCPU or an FX5UCCPU in version 1.065T or later cannot be read from the CPU module in version 1.063R or earlier. |
| Reading from an SD memory card | In projects for an FX5UCPU and an FX5UCCPU, if parameters of a device station on CC-Link IE TSN are written to an SD memory card in version 1.065T or later, an error occurs when the parameters are read in version 1.063R or earlier. |
| Opening a simulation environment file | A simulation environment file saved in version 1.065T or later cannot be opened in version 1.063R or earlier. |
| Event history | If an event history is collected with the following parameter set to "Save," the history cannot be displayed in version 1.063R or earlier. • "CPU Parameter" ⇒ "RAS Setting" ⇒ "Event History Setting" ⇒ "Save Device/Label Operations" |

■Using a project, which was created in version 1.070Y or later, in version 1.066U or earlier

| Function | Consideration |
|--|--|
| Overwriting a project | If a project in which a label comment is set for an array element or bit-specified label is overwritten in version 1.066U or earlier, the label comment cannot be used. |
| Opening a project | When an RnSFCPU project in which a recorder module has been placed is opened in version 1.066U or earlier, a recording setting is displayed in the navigation window; however, safety devices are excluded from the collection targets of the recording function. If the recorder module is registered in the project again, the recording setting disappears from the navigation window. |
| Opening a project Reading data from a programmable controller | An error occurs at the program conversion when an FX5CPU project that contains a program with an index-modified step relay (S) is opened or read from a CPU module in version 1.066U or earlier. |
| Opening a project Reading data from a programmable controller Verification | Projects for an FX5UCPU and an FX5UCCPU that include an SFC program cannot be opened, read from the CPU module, or verified with another project in version 1.066U or earlier. |
| Library operation | Libraries that contain an SFC program used in projects for an FX5UCPU and an FX5UCCPU cannot be used in version 1.066U or earlier. |
| Intelligent function module monitor | When a project saved with all the following conditions satisfied is opened in version 1.066U or earlier, a registered device station is not displayed in an intelligent function module monitor: • A device station on CC-Link IE TSN is registered in the intelligent function module monitor. • The intelligent function module monitor is open. |
| Log marker | A log marker information file (*.lmcs) created in version 1.070Y or later cannot be read in version 1.066U or earlier. |

■Using a project, which was created in version 1.072A or later, in version 1.070Y or earlier

| Function | Consideration |
|--|---|
| Reading data from a programmable controller | When a project, in which a redundant extension base unit (R66WRB-HT) has been placed, is read from a CPU module in version 1.070Y or earlier, the model name of this base unit (R66WRB-HT) is displayed blank in the "System Parameter" screen. |
| Reading data from a programmable controller Opening a recording setting | If the following option is selected in a project in which a recorder module has been placed, a device/label specified as a collection target is deleted when reading the project from a CPU module or opening the "Recording Setting" screen in version 1.070Y or earlier. • The "Recording Setting" screen ⇒ "Device/Label Sampling Setting" ⇒ "Device/Label Sampling Target Setting" ⇒ "Specify from the device/label used" ⇒ "Manual" |

■Using a project, which was created in version 1.075D or later, in version 1.072A or earlier

| Function | Consideration |
|--|--|
| Opening a project Writing data to a programmable controller | When a project, in which a CC-Link IE TSN compatible motion module is set to "Synchronize" in the "Select the Synchronous Target Module" screen, is opened in version 1.072A or earlier, the setting is displayed as "Do Not Synchronize." However, the CC-Link IE TSN compatible motion module is actually set as a synchronous target. If this project is written to a CPU module, the CC-Link IE TSN compatible motion module is written as a synchronous target. |
| Opening a project Reading data from a programmable controller | An error occurs when converting a program if a project, where the display format of a transition (Zoom) including a close contact is changed, is opened or read from a CPU module in version 1.072A or earlier. |
| Verifying data with a programmable controller | When a program, in which "Extended Mode (iQ-R Series Mode)" is selected for "Link Direct Device Setting" in the CPU parameters for an RnPCPU, is verified with another project created in version 1.072A or earlier, the link direct device names of the verification destination will not be displayed properly in the detailed display tab. Therefore, "Mismatch" will be displayed in the verification result. |
| Simple CPU communication setting | If a project satisfies all the following conditions, the values in the simple CPU communication setting may become incorrect when opening the setting in version 1.072A or earlier. <ul style="list-style-type: none"> • A serial communication module was placed in a project in version 1.072A or earlier. • The above project was opened in version 1.075D or later, and the simple CPU communication setting was configured. In this case, upgrade the version to 1.075D or later, then open the simple CPU communication setting. |

■Using a project, which was created in version 1.080J or later, in version 1.077F or earlier

| Function | Consideration |
|---|--|
| Opening a project | Connection destination settings return to the default when the "Specify Connection Destination" screen is opened if a project, in which the settings meet the following condition, is opened in version 1.077F or earlier: <ul style="list-style-type: none"> • "GOT" is selected for "PLC side I/F," and "CC IE TSN" is set in the "PLC side I/F Detailed Setting of GOT" screen. Connection destination settings return to the default when the "Specify Connection Destination" screen is opened if a project for an FX5CPU, in which the settings meet the following condition, is opened in version 1.077F or earlier: <ul style="list-style-type: none"> • "Ethernet Board" is selected for "PC side I/F," and "GOT" for "PLC side I/F," and "Ethernet Built-in CPU" is set for "via GOT (Ethernet) transparent mode" in the "PLC side I/F Detailed Setting of GOT" screen. In addition, the settings in "Network Communication Route Detailed Setting of Ethernet" are discarded if a project, in which the connection destination settings meet the following condition, is opened in version 1.077F or earlier: <ul style="list-style-type: none"> • "Ethernet Board" is selected for "PC side I/F," and "GOT" for "PLC side I/F," and "FX5-ENET(IP)" is set for "via GOT (Ethernet) transparent mode" in the "PLC side I/F Detailed Setting of GOT" screen. |
| Opening a project Writing data to a programmable controller | When a project, in which a CC-Link IE TSN compatible motion module (RD78G4(S), RD78G8(S), or RD78G16(S) only) is set to "Synchronize" in the "Select the Synchronous Target Module" screen, is opened in version 1.077F or earlier, the setting is displayed as "Do Not Synchronize." However, the CC-Link IE TSN compatible motion module is actually set as a synchronous target. If this project is written to a CPU module, the CC-Link IE TSN compatible motion module is written as a synchronous target. |
| Opening a project Reading data from a programmable controller | A project, in which any arguments of function elements/function block elements are hidden, cannot be opened or read from a CPU module in version 1.077F or earlier. In this case, show the hidden arguments again, then open the project or read it from a CPU module in version 1.077F or earlier. |
| Reading data from a programmable controller | The following parameters return to the default when a project, in which "Use TSN HUB" is selected for "TSN HUB Setting" in the module parameters for a CC-Link IE TSN module (RJ71GN11-T2), is read from a CPU module in version 1.077F or earlier: <ul style="list-style-type: none"> • Network Topology • Setting in units of 1us • Communication Period Interval Setting (Do not Set it in Units of 1us) • Communication Period Interval Setting (Set it in Units of 1us) • System Reservation Time • Cyclic Transmission Time • Transient Transmission Time • Authentication Class Setting • Disconnection Detection Setting • Station-based Block Data Assurance An error occurs when changing the module parameters of a project after reading the project, in which "Refresh Setting" in the module parameters is set for a CC-Link IE TSN compatible motion module (RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, or RD78GHW only), from a CPU module in version 1.077F or earlier. |
| Opening a project Reading data from a programmable controller Project verification Verifying data with a programmable controller | A project using any of the following standard process FBs cannot be opened, verified, or read from a CPU module in version 1.077F or earlier: M+TP_HIGH, M+TP_LOW, M+TON_HIGH, M+TON_LOW, M+TOF_HIGH, and M+TOF_LOW. A project that contains an FBD/LD program using an inline structured text program cannot be opened, verified, or read from a CPU module in version 1.077F or earlier. |
| Library operation | Libraries that contain an inline structured text program used in an FBD/LD program can be registered in the library list in version 1.077F or earlier, but they cannot be used. |

■Using a project, which was created in version 1.082L or later, in version 1.080J or earlier

| Function | Consideration |
|-----------------|---|
| Remote password | When a project, in which "CC-Link IE TSN Plus Master/Local Module" is set for "Product Name" in the "Remote Password Setting" screen, is opened in version 1.080J or earlier, "CC-Link IE TSN Plus Master/Local Module" is changed to "Unsupported Module." |

■Using a project, which was created in version 1.085P or later, in version 1.082L or earlier

| Function | Consideration |
|---|--|
| Library operation | Libraries that contain the following elements cannot be used in version 1.082L or earlier. <ul style="list-style-type: none"> • System header POU (M+PHEADER) • System footer POU (M+PFOOTER) • Global label setting 'M+PTAG' • Process control function block • Tag data structure |
| Reading data from a programmable controller | The following parameters return to the default when a project, in which "Use TSN HUB" is selected for "TSN HUB Setting" in the module parameters for a CC-Link IE TSN module (FX5-CCLGN-MS), is read from a CPU module in version 1.082L or earlier: <ul style="list-style-type: none"> • Setting in units of 1us • Communication Period Interval Setting (Do not Set it in Units of 1us) • Communication Period Interval Setting (Set it in Units of 1us) • System Reservation Time • Cyclic Transmission Time • Transient Transmission Time • Authentication Class Setting • Disconnection Detection Setting • Station-based Block Data Assurance |

■Using a project, which was created in version 1.090U or later, in version 1.087R or earlier

| Function | Consideration |
|--|---|
| Opening a project Reading data from a programmable controller | When opening either of the following projects for an LHCPU in version 1.087R or earlier, device comments/device memories/device initial values of Un\G65536 and later cannot be displayed or edited. <ul style="list-style-type: none"> • A project in which device comments/device memories/device initial values of Un\G65536 and later are set. • A project that contains a program in which module access devices of Un\G65536 and later are not changed from the initial values. |
| Verifying data with a programmable controller | When opening either of the following projects for an LHCPU in version 1.087R or earlier, device comments/device memories of Un\G65536 and later cannot be verified. <ul style="list-style-type: none"> • A project in which device comments/device memories/device initial values of Un\G65536 and later are set. • A project that contains a program in which module access devices of Un\G65536 and later are not changed from the initial values. |
| Conversion | In a project for an LHCPU that contains a program in which module access devices of Un\G65536 and later are used, an error occurs at the conversion in version 1.087R or earlier. |
| Remote password | When a project for an FX5UJCPU, in which "CC-Link IE TSN Module" is set for "Product Name" in the "Remote Password Setting" screen, is opened in version 1.087R or earlier, "CC-Link IE TSN Module" is changed to "Unsupported Module." |

■Using a project, which was created in version 1.095Z or later, in version 1.090U or earlier

| Function | Consideration |
|--|---|
| Reading data from a programmable controller | When a project, in which a power supply module (R69P, R69RP) has been placed, is read from a CPU module in version 1.090U or earlier, the model name of this power supply module (R69P, R69RP) is displayed blank in the "System Parameter" screen. |
| Opening a project Reading data from a programmable controller Verification | Projects for an FX5UJCPU and an FX5SCPU that include an SFC program cannot be opened, read from the CPU module, or verified with another project in version 1.090U or earlier. |
| Library operation | Libraries that contain an SFC program used in projects for an FX5UJCPU and an FX5SCPU cannot be used in version 1.090U or earlier. |
| Connection destination specification | Connection destination settings return to the default when a communication route is set to access a CPU module via either of the following modules: <ul style="list-style-type: none"> • CC-Link IE Field Network master/local module (LJ71GF11-T2) • Ethernet interface module (LJ71E71-100) |

■Using a project, which was created in version 1.096A or later, in version 1.095Z or earlier

| Function | Consideration |
|----------------------|--|
| Project verification | If a security version of a project, which was created in version 1.096A or later, is '2,' the project cannot be verified with a project created in version 1.095Z or earlier. |
| Offline monitor | When a project that satisfies both of the following conditions is written to a programmable controller, and then a recording file is read from the programmable controller in version 1.095Z or earlier, the recording file cannot be monitored. <ul style="list-style-type: none"> • A security version is set to "2." • A recorder module is placed. |

■Using a project, which was created in version 1.100E or later, in version 1.097B or earlier

| Function | Consideration |
|-------------------|---|
| Opening a project | Connection destination settings return to the default when the "Specify Connection Destination" screen is opened if a project for an LHCPU, in which the settings meet the following condition, is opened in version 1.097B or earlier: <ul style="list-style-type: none"> • "Ethernet Board" is selected for "PC side I/F," and "GOT" for "PLC side I/F," and "Ethernet Built-in CPU" is set for "via GOT (Ethernet) transparent mode" in the "PLC side I/F Detailed Setting of GOT" screen. <p>Connection destination settings return to the default when the "Specify Connection Destination" screen is opened if a communication route is set to access a CPU module via a CC-Link IE TSN interface board.</p> |

■Using a project, which was created in version 1.105K or later, in version 1.101F or earlier

| Function | Consideration |
|---------------------------------------|--|
| Process control function block | Projects that use any of the following status tags added in Version 1.105K cannot be opened, read from the CPU module, or verified with another project in version 1.101F or earlier. <ul style="list-style-type: none"> • M+M_MTR2 • M+M_MTR3 • M+M_SS2P • M+M_DS2P • M+M_DS3P |
| Opening a simulation environment file | A simulation environment file saved in version 1.105K or later cannot be opened in version 1.101F or earlier. |

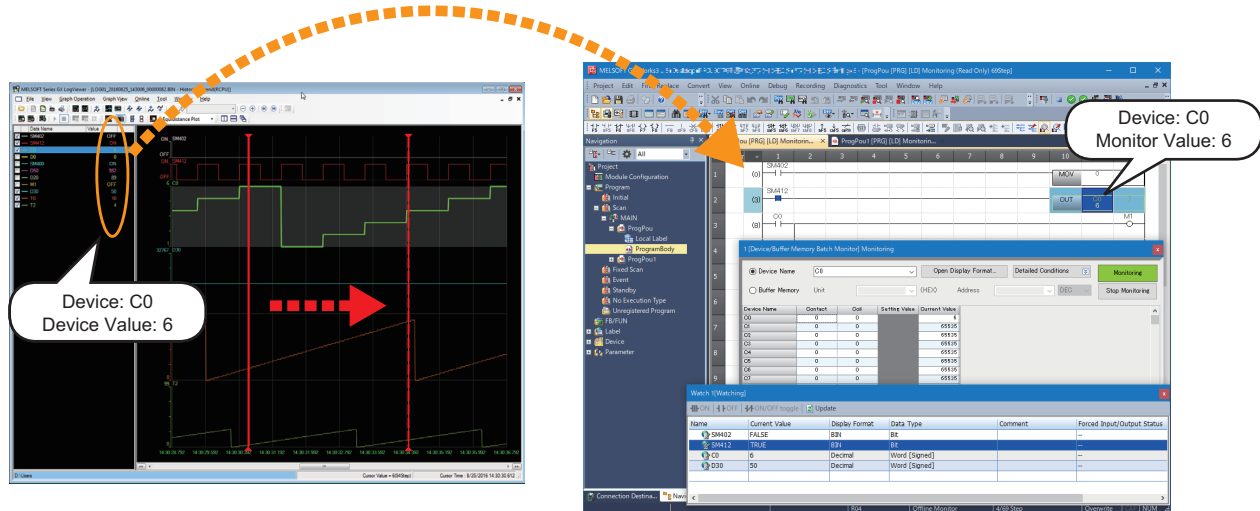
■Using a project, which was created in version 1.110Q or later, in version 1.106L or earlier

| Function | Consideration |
|---|--|
| Library operation | When the security version of a project in which a library file is created is '2,' the library cannot be used in version 1.106L or earlier. |
| Reading data from a programmable controller | When a project, in which a power supply module (R61SP) or a main base unit (R32SB, R33SB, R35SB) has been placed, is read from a CPU module in version 1.106L or earlier, the model name of this module or unit is displayed blank in the "System Parameter" screen. |

Appendix 3 Using a Previous Version of Function

Checking logging data in version 1.063R or earlier

A value of logging data displayed in GX LogViewer can be displayed on the monitor screen of GX Works3. When moving the red cursor of GX LogViewer, a monitor value in GX Works3 is also changed accordingly. To use this function, GX LogViewer Version 1.64S or later is required to be installed.



Operating procedure

The following shows the operating procedure to check logging data.

Operating procedure

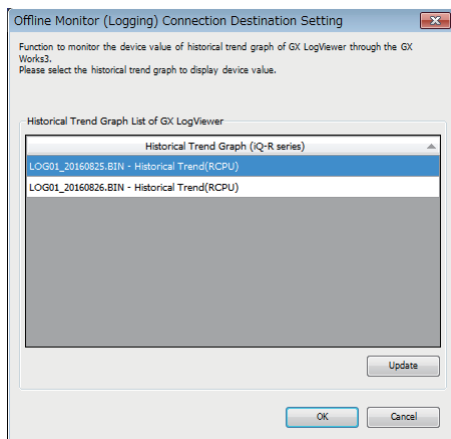
1. Open a logging file in GX LogViewer.
2. Set a logging file to be monitored in GX Works3. (➡ Page 923 Selecting a target monitor)
3. Start offline monitoring in GX Works3. (➡ Page 924 Starting offline monitoring)
4. Stop offline monitoring in GX Works3. (➡ Page 924 Stopping offline monitoring)

Selecting a target monitor

Set a logging file to be monitored in the "Offline Monitor (Logging) Connection Destination Setting" screen.
Only a logging file (*.bin) output from an RCP or an FX5CPU can be set.

Window

Select [Debug] ⇒ [Offline Monitor] ⇒ [Offline Monitor (Logging)] ⇒ [Connection Destination Setting].



Operating procedure

Select a logging file, and click the [OK] button.
"Offline Monitor" is displayed on the status bar.

Precautions

- A logging file is not displayed in the list when opening the "Offline Monitor (Logging) Connection Destination Setting" screen in GX Works3 before opening the logging file in GX LogViewer. Open a logging file in GX LogViewer, then click the [Update] button in the "Offline Monitor (Logging) Connection Destination Setting" screen.
- A logging file is not displayed in the list when performing any of the following functions in GX LogViewer.
[Graph View] ⇒ [Change the Data to Draw Graphs]
[Graph Operation] ⇒ [Show Previous Graph] or [Show Next Graph]

A

Starting offline monitoring

Operating procedure

1. Start monitoring in GX Works3. (📖 Page 633 Starting/stopping monitoring)
2. Move the red cursor in the "Historical Trend" window of GX LogViewer.

An updated device value in the graph legend area is displayed in the monitor screen of GX Works3.

■Online operation during offline monitoring

The following online functions are available during offline monitoring:

- Monitor on a program editor
- Device/buffer memory batch monitor
- Watch

Stopping offline monitoring

Operating procedure

Select [Debug] ⇒ [Offline Monitor] ⇒ [Offline Monitor (Logging)] ⇒ [Disconnect Offline Monitor].

Monitoring stops in all screens in GX Works3.

■Pausing and restarting offline monitoring

When stopping monitoring in GX Works3, offline monitoring pauses only in the stopped screen.

When restarting monitoring in GX Works3, offline monitoring also restarts.

Considerations

■Duplicate devices

When multiple same devices exist in a logging file, the value of the device that is displayed at the lowermost row in the graph legend area of GX LogViewer is displayed in the monitor screen of GX Works3.

■Active status of blocks/steps in an SFC program

Active status is not displayed on an SFC diagram editor.

All blocks are displayed as "Uncreated Block" on all SFC blocks batch monitor.

■Conditions that monitored values are not displayed properly

When any of the following conditions is satisfied, a monitor value is not displayed properly.

| Condition | Value |
|--|---|
| A device value to be monitored does not exist in a file opened in the "Historical Trend" window. | The following values are displayed. <ul style="list-style-type: none">• Bit device, bit-specified word device: FALSE (0)• Word device, double-word device, FLOAT [Double Precision]: -1 |
| A device that exists either in the lower bit or the upper bit is monitored by specifying it in double-word format. | |
| An indirectly specified device is monitored. | |
| An index-modified device is monitored. | A device value excluding the index modification part is displayed. (Example: "D0" is displayed for "D0Z0.") |
| A project which was written to a CPU module when a logging file was output and a project to monitor do not match. | If label assignment status is inconsistent between in a logging file and in a project to be monitored, values that are different from the ones displayed in the "Historical Trend" window of GX LogViewer may be displayed. |

■Conditions that labels can be monitored

Label values in a logging file can be monitored only when all of the following conditions are satisfied.

- GX Works3 Version 1.045X or later is used.
- GX LogViewer Version 1.82L or later is used.
- Monitoring is performed in the project which was written to a CPU module when a logging file was output.
- Label assignment status is consistent between in a logging file and in a project to be monitored.

Appendix 4 Unusable Character Strings (Reserved Words)

Character strings used for application instruction names, common instruction names, special instruction names, instructions and so on are referred to as the reserved words.

Reserved words may not be used for names.

When the character strings defined as reserved words is used for names, an error occurs at the registration or conversion.

Precautions

Characters are not case-sensitive.

Unusable character strings for a name of a project/work space/library

| Category | | Character string |
|-----------------------|----------------|---|
| Invalid character | Symbol | Space, ", %, ', *, /, ., :, <, >, ?, \, , environment dependent characters |
| | Surrogate pair | 0xD800 to 0xDBFF, 0xDC00 to 0xDFFF |
| | Control code | U+0000 to U+001F, U+007F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF |
| Windows reserved word | | COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, AUX, CON, PRN, NUL, CLOCK\$, END_MARK |

Unusable character strings for a data name

| Category | | Character string |
|--------------------------|----------------------|--|
| Invalid character | Symbol ^{*1} | Space, !, ", #, \$, %, &, ', (,), *, +, /, ., :, ;, <, =, >, ?, @, [\], ^, ` , {, , }, ~, environment dependent characters |
| | Surrogate pair | 0xD800 to 0xDBFF, 0xDC00 to 0xDFFF |
| | Control code | U+0000 to U+001F, U+007F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF |
| | Others ^{*1} | COMMENT, GLBLINF, LOCALLABEL, SLIBFBFILE |
| Windows reserved word | | COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, AUX, CON, PRN, NUL, CLOCK\$, END_MARK |
| Data type reserved words | Class ^{*1} | VAR, VAR_RETAIN, VAR_ACCESS, VAR_CONSTANT, VAR_INPUT, VAR_INPUT_RETAIN, VAR_OUTPUT, VAR_OUTPUT_RETAIN, VAR_IN_OUT, VAR_IN_EXT, VAR_EXTERNAL, VAR_EXTERNAL_CONSTANT, VAR_EXTERNAL_RETAIN, VAR_GLOBAL, VAR_GLOBAL_CONSTANT, VAR_GLOBAL_RETAIN, VAR_PUBLIC, VAR_PUBLIC_RETAIN |
| | Data type | BOOL, BYTE, INT, SINT, DINT, LINT, UINT, USINT, UDINT, ULINT, WORD, DWORD, DWORD, LWORD, ARRAY, REAL, LREAL, TIME, STRING, WSTRING, TIMER, LTIMER, RETENTIVETIMER, LRETENTIVETIMER, COUNTER, LCOUNTER, POINTER ANY, ANY_NUM, ANY_BIT, ANY_REAL, ANY_INT, ANY_DATE, ANY_SIMPLE, ANY16, ANY32, DATE, DATE_AND_TIME, DT, TIME, TIME_OF_DAY, TOD, BODY_CCE, BODY_FBD, BODY_IL, BODY_LD, BODY_SFC, BODY_ST, END_BODY, END_PARAMETER_SECTION, PARAM_FILE_PATH, PARAMETER_SECTION, POW, LONGCOUNTER, LONGRETENTIVETIMER, LONGTIMER, UNKNOWN, ANY_BITADDR, ANY_WORDADDR, ANY_STRING, ANYSTRING_SINGLE, ANYSTRING_DOUBLE, ANY_ELEMENTARY, ANY_ELEMENTARY_IEC, ANY_MAGNITUDE, ANY_BOOL, ANY_SIGNED, ANY_UNSIGNED, ANYREAL_64, ANYREAL_32, ANY_DERIVED, ANY16_S, ANY16_U, ANY32_S, ANY32_U, ANY64, ANY64_S, ANY64_U, ANY_STRUCT, ANYWORD_ARRAY, ANY16_ARRAY, ANY16_S_ARRAY, ANY16_U_ARRAY, ANY32_ARRAY, ANY32_S_ARRAY, ANY32_U_ARRAY, ANY64_ARRAY, ANY64_S_ARRAY, ANY64_U_ARRAY, ANY_REAL_ARRAY, ANY_REAL_32_ARRAY, ANY_REAL_64_ARRAY, ANY_STRING_ARRAY, ANYSTRING_SINGLE_ARRAY, ANYSTRING_DOUBLE_ARRAY, ANYBIT_ARRAY, UINT_WORD, UDINT_DWORD, ULINT_LWORD, TIME2, KBIT64, KBIT32, KBIT16, WDEVICE, BDEVICE, DUMMYDEVICE, FB, FUN, STRUCT_MEMBER, BIT_ARRAY, STRUCT_ARRAY, STRING_ARRAY, WSTRING_ARRAY, LINT_ARRAY, ULINT_LWORD_ARRAY, DINT_ARRAY, UDINT_DWORD_ARRAY, INT_ARRAY, UINT_WORD_ARRAY, REAL_ARRAY, LREAL_ARRAY, TIME_ARRAY, NONE, ANY16_OR_STRING_SINGLE, ANY_DT, ANY_TM, ANY_BOOL_OR_POINTER |

A

| Category | | Character string |
|---------------------------------|--------|---|
| IEC reserved word ^{*1} | | ABS, ACOS, ACTION, ADD, AND, ANDN, ANY, ANY_BIT, ANY_INT, ANY_NUM, ANY_REAL, ARRAY, ASIN, AT, ATAN, BOOL, BY, BYTE, CAL, CALC, CASE, CONCAT, CONFIGURATION, CONSTANT, CONTINUE, COS, CTD, CTU, CTUD, D, DATE, DATE_AND_TIME, DELETE, DINT, DIV, DO, DT, DWORD, ELSE, ELIF, END_ACTION, END_CASE, END_CONFIGURATION, END_FOR, END_FUNCTION, END_FUNCTION_BLOCK, END_IF, END_PROGRAM, END_REPEAT, END_RESOURCE, END_STEP, END_STRUCT, END_TRANSITION, END_TYPE, END_VAR, END_WHILE, EN, ENO, EQ, EXIT, EXP, EXPT, FALSE, F_EDGE, F_TRIG, FIND, FOR, FROM, FUNCTION, FUNCTION_BLOCK, GE, GT, IF, INITIAL_STEP, INSERT, INT, INTERVAL, JMP, JMPC, JMPCN, L, LD, LDN, LE, LEFT, LEN, LIMIT, LINT, LN, LOG, LREAL, LT, LWORD, MAX, MID, MIN, MOD, MOVE, MUL, MUX, N, NE, NEG, NOT, OF, ON, OR, ORN, P, PROGRAM, R, R1, R_TRIG, READ_ONLY, READ_WRITE, REAL, REPEAT, REPLACE, RESOURCE, RET, RETAIN, RETC, RETURN, RIGHT, ROL, ROR, RS, R_EDGE, S, S1, SD, SEL, SHL, SHR, SIN, SINGLE, SINT, SQRT, SR, ST, STEP, STN, STRING, STRUCT, SUB, TAN, TASK, THEN, TIME, TIME_OF_DAY, TO, TOD, TOF, TON, TP, TRANSITION, TRUE, TYPE, UDINT, UINT, ULINT, UNTIL, USINT, VAR, VAR_ACCESS, VAR_EXTERNAL, VAR_GLOBAL, VAR_INPUT, VAR_IN_OUT, VAR_OUTPUT, WHILE, WITH, WORD, XOR, XORN |
| Code conversion ^{*1} | Device | A, B, BL, C, CC, CN, CS, D, DX, DY, E, F, FD, FX, FY, G ^{*2} , GLP, H, HG ^{*2} , I, J, K, L, LC, LCC, LCN, LCS, LLP, LSC, LSN, LSS, LST, LSTC, LSTN, LSTS, LT, LTC, LTN, LTS, LZ, M, N, P, PH, R, RD, S, SB, SC, SD, SM, SN, SS, ST, STC, STN, STS, SW, SZ, T, TC, TN, TR, TS, U, V, VD, W, X, Y, Z, ZR, ZZ, RX ^{*2} , RY ^{*2} , RWr ^{*2} , RWW ^{*2} |
| | Others | Manufacturer-provided functions/function blocks, MELSEC instructions supported by a CPU module ^{*3} |

*1 Available for some names.

*2 Regarded as a reserved word when the character string is used with a number.

*3 Some instructions that are not supported by a CPU module may not be used. (Example: NOP and PHASERST)

Unusable character strings for a label name

| Category | | Character string |
|--------------------------|----------------|---|
| Invalid character | Symbol | Space, !, ", #, \$, %, &, ', (,), *, +, /, ,, -, ., : ;, <, =, >, ?, @, [, \,], ^, ` , {, , }, ~, environment dependent characters |
| | Surrogate pair | 0xD800 to 0xDBFF, 0xDC00 to 0xDFFF |
| | Control code | U+0000 to U+001F, U+007F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF |
| Windows reserved word | | CLOCK\$ |
| Data type reserved words | Class | VAR, VAR_RETAIN, VAR_ACCESS, VAR_CONSTANT, VAR_INPUT, VAR_INPUT_RETAIN, VAR_OUTPUT, VAR_OUTPUT_RETAIN, VAR_IN_OUT, VAR_IN_EXT, VAR_EXTERNAL, VAR_EXTERNAL_CONSTANT, VAR_EXTERNAL_RETAIN, VAR_GLOBAL, VAR_GLOBAL_CONSTANT, VAR_GLOBAL_RETAIN, VAR_PUBLIC, VAR_PUBLIC_RETAIN |
| | Data type | BOOL, BYTE, INT, SINT, DINT, LINT, UINT, USINT, UDINT, ULINT, WORD, DWORD, LWORD, ARRAY, REAL, LREAL, TIME, STRING, WSTRING, TIMER, LTIMER, RETENTIVETIMER, LRETENTIVETIMER, COUNTER, LCOUNTER, POINTER ANY, ANY_NUM, ANY_BIT, ANY_REAL, ANY_INT, ANY_DATE, ANY_SIMPLE, ANY16, ANY32, DATE, DATE_AND_TIME, DT, TIME, TIME_OF_DAY, TOD, BODY_CCE, BODY_FBD, BODY_IL, BODY_LD, BODY_SFC, BODY_ST, END_BODY, END_PARAMETER_SECTION, PARAM_FILE_PATH, PARAMETER_SECTION, POW, LONGCOUNTER, LONGRETENTIVETIMER, LONGTIMER, UNKNOWN, ANY_BITADDR, ANY_WORDADDR, ANY_STRING, ANYSTRING_SINGLE, ANYSTRING_DOUBLE, ANY_ELEMENTARY, ANY_ELEMENTARY_IEC, ANY_MAGNITUDE, ANY_BOOL, ANY_SIGNED, ANY_UNSIGNED, ANYREAL_64, ANYREAL_32, ANY_DERIVED, ANY16_S, ANY16_U, ANY32_S, ANY32_U, ANY64, ANY64_S, ANY64_U, ANY_STRUCT, ANYWORD_ARRAY, ANY16_ARRAY, ANY16_S_ARRAY, ANY16_U_ARRAY, ANY32_ARRAY, ANY32_S_ARRAY, ANY32_U_ARRAY, ANY64_ARRAY, ANY64_S_ARRAY, ANY64_U_ARRAY, ANY_REAL_ARRAY, ANY_REAL_32_ARRAY, ANY_REAL_64_ARRAY, ANY_STRING_ARRAY, ANYSTRING_SINGLE_ARRAY, ANYSTRING_DOUBLE_ARRAY, ANYBIT_ARRAY, UINT_WORD, UDINT_DWORD, ULINT_LWORD, TIME2, KBIT64, KBIT32, KBIT16, WDEVICE, BDEVICE, DUMMYDEVICE, FB, FUN, STRUCT_MEMBER, BIT_ARRAY, STRUCT_ARRAY, STRING_ARRAY, WSTRING_ARRAY, LINT_ARRAY, ULINT_LWORD_ARRAY, DINT_ARRAY, UDINT_DWORD_ARRAY, INT_ARRAY, UINT_WORD_ARRAY, REAL_ARRAY, LREAL_ARRAY, TIME_ARRAY, NONE, ANY16_OR_STRING_SINGLE, ANY_DT, ANY_TM, ANY_BOOL_OR_POINTER |
| IEC reserved word | | ABS, ACOS, ACTION, ADD, AND, ANDN, ANY, ANY_BIT, ANY_INT, ANY_NUM, ANY_REAL, ARRAY, ASIN, AT, ATAN, BOOL, BY, BYTE, CAL, CALC, CASE, CONCAT, CONFIGURATION, CONSTANT, CONTINUE, COS, CTD, CTU, CTUD, D, DATE, DATE_AND_TIME, DELETE, DINT, DIV, DO, DT, DWORD, ELSE, ELIF, END_ACTION, END_CASE, END_CONFIGURATION, END_FOR, END_FUNCTION, END_FUNCTION_BLOCK, END_IF, END_PROGRAM, END_REPEAT, END_RESOURCE, END_STEP, END_STRUCT, END_TRANSITION, END_TYPE, END_VAR, END_WHILE, EN, ENO, EQ, EXIT, EXP, EXPT, FALSE, F_EDGE, F_TRIG, FIND, FOR, FROM, FUNCTION, FUNCTION_BLOCK, GE, GT, IF, INITIAL_STEP, INSERT, INT, INTERVAL, JMP, JMPC, JMPCN, L, LD, LDN, LE, LEFT, LEN, LIMIT, LINT, LN, LOG, LREAL, LT, LWORD, MAX, MID, MIN, MOD, MOVE, MUL, MUX, N, NE, NEG, NOT, OF, ON, OR, ORN, P, PROGRAM, R, R1, R_TRIG, READ_ONLY, READ_WRITE, REAL, REPEAT, REPLACE, RESOURCE, RET, RETAIN, RETC, RETURN, RIGHT, ROL, ROR, RS, R_EDGE, S, S1, SD, SEL, SHL, SHR, SIN, SINGLE, SINT, SQRT, SR, ST, STEP, STN, STRING, STRUCT, SUB, TAN, TASK, THEN, TIME, TIME_OF_DAY, TO, TOD, TOF, TON, TP, TRANSITION, TRUE, TYPE, UDINT, UINT, ULINT, UNTIL, USINT, VAR, VAR_ACCESS, VAR_EXTERNAL, VAR_GLOBAL, VAR_INPUT, VAR_IN_OUT, VAR_OUTPUT, WHILE, WITH, WORD, XOR, XORN |
| Code conversion | Device | A, B, BL, C, CC, CN, CS, D, DX, DY, E, F, FD, FX, FY, G ^{*1} , GLP ^{*1} , H, HG ^{*1} , I, J, K, L, LC, LCC, LCN, LCS, LLP ^{*1} , LSC ^{*1} , LSN ^{*1} , LSS ^{*1} , LST, LSTC, LSTN, LSTS, LT, LTC, LTN, LTS, LZ, M, N, P, PH, R, RD, S, SB, SC ^{*1} , SD, SM, SN ^{*1} , SS ^{*1} , ST, STC ^{*1} , STN ^{*1} , STS ^{*1} , SW, SZ ^{*1} , T, TC, TN, TR, TS, U, V, VD, W, X, Y, Z, ZR, ZZ, RX ^{*1} , RY ^{*1} , RWw ^{*1} |
| | Others | Manufacturer-provided functions/function blocks, MELSEC instructions supported by a CPU module ^{*2} |

*1 Regarded as a reserved word when the character string is used with a number.

*2 Some instructions that are not supported by a CPU module may not be used. (Example: NOP and PHASERST)

Unusable character strings for a path name

| Category | | Character string |
|-----------------------|----------------|---|
| Invalid character | Symbol | ", *, /, ,, ;, <, >, ?, , environment dependent characters ^{*1} |
| | Surrogate pair | 0xD800 to 0xDBFF, 0xDC00 to 0xDFFF |
| | Control code | U+0000 to U+001F, U+007F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF |
| Windows reserved word | | COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, AUX, CON, PRN, NUL, CLOCK\$, END_MARK |

^{*1} When an environment dependent character is included in a path name, a project can be opened by using the following menu:
[Project] ⇒ [Open]

Appendix 5 Applicable Devices in GX Works3

RCPUs

○: Applicable, △: Display only, ×: Not applicable —: Not available

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory | Initial device value |
|---------------------------------|---------------------------------|--------|---------------------|---------------------------|----------------|---------------|----------------------|
| User device | Input | X | ○ | — | ○ | △ | × |
| | Output | Y | ○ | — | ○ | △ | × |
| | Internal relay | M | ○ | — | ○ | ○ | × |
| | | #M | ○ | — | ○ | ○ | × |
| | Latch relay | L | ○ | — | ○ | ○ | × |
| | Link relay | B | ○ | — | ○ | ○ | × |
| | Annunciator | F | ○ | — | ○ | ○ | × |
| | Link special relay | SB | ○ | — | ○ | △ | × |
| | Edge relay | V | ○ | — | ○ | ○ | × |
| | | #V | ○ | — | ○ | ○ | × |
| | Step relay | S*1 | ○ | — | × | △ | × |
| | Timer | T | — | × | ○ | ○ | ○ |
| | | #T | — | × | ○ | ○ | ○ |
| | Retentive timer | ST | — | × | ○ | ○ | ○ |
| | | #ST | — | × | ○ | ○ | ○ |
| | Long timer | LT | — | × | ○ | ○ | ○ |
| | | #LT | — | × | ○ | ○ | ○ |
| | Long retentive timer | LST | — | × | ○ | ○ | ○ |
| | | #LST | — | × | ○ | ○ | ○ |
| | Counter | C | — | × | ○ | ○ | ○ |
| | | #C | — | × | ○ | ○ | ○ |
| | Long counter | LC | — | × | ○ | ○ | ○ |
| | | #LC | — | × | ○ | ○ | ○ |
| | Data register | D | — | ○ | ○ | ○ | ○ |
| | | #D | — | ○ | ○ | ○ | ○ |
| | Link register | W | — | ○ | ○ | ○ | ○ |
| | Link special register | SW | — | ○ | ○ | ○ | ○ |
| | Direct access input | DX | — | | | | |
| | Direct access output | DY | — | | | | |
| System device | Function input | FX | — | | | | |
| | Function output | FY | — | | | | |
| | Function register | FD | — | | | | |
| | Special relay | SM | ○ | — | ○ | △ | × |
| | Special register | SD | — | ○ | ○ | ○ | ○ |
| Link direct device | Link input | J□X | ○ | — | ○ | △*2 | × |
| | Link output | J□Y | ○ | — | ○ | △*2 | × |
| | Link relay | J□B | ○ | — | ○ | △*2 | × |
| | Link special relay | J□SB | ○ | — | ○ | △*2 | × |
| | Link register | J□W | — | ○ | ○ | ○*2 | ○ |
| | Link special register | J□SW | — | ○ | ○ | ○*2 | ○ |
| Module access device | Module access device | U□G | — | ○ | ○ | ○*2 | ○ |
| CPU buffer memory access device | CPU buffer memory access device | U3E□G | — | ○ | ○ | ○*2 | ○ |
| | | U3E□HG | — | ○ | ○ | ○*2 | ○ |

A

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory | Initial device value |
|-----------------------|--|--------|---------------------|---------------------------|----------------|---------------|----------------------|
| Index register | Index register | Z | — | × | × | ○ | × |
| | | #Z | — | × | × | ○ | × |
| | Long index register | LZ | — | × | × | ○ | × |
| | | #LZ | — | × | × | ○ | × |
| File register | File register | R | — | ○ | ○ | × | × |
| | | ZR | — | ○ | ○ | ○ | ○ |
| Refresh data register | Refresh data register | RD | — | ○ | ○ | ○ | ○ |
| Nesting | Nesting | N | — | — | × | × | × |
| Pointer | Pointer | P | — | — | ○ | × | × |
| | | #P | — | — | ○ | × | × |
| | Interrupt pointer | I | — | — | ○ | × | × |
| Other devices | SFC block device | BL | — | — | ○ | × | × |
| | SFC transition device | TR | — | — | × | × | × |
| | Step relay (with block specification) | BL□\S | — | — | ○ | × | × |
| | SFC transition device (with block specification) | BL□\TR | — | — | ○ | × | × |
| | Network number specified device | J | — | — | ○ | × | × |
| | I/O number specified device | U | — | — | ○ | × | × |
| Constant | Decimal constant | K | — | | | | |
| | Hexadecimal constant | H | — | | | | |
| | Real constant | E | — | | | | |
| | String constant | — | — | | | | |

*1 When editing it in other places except in a Zoom, specify a step relay with block specification (BL□\S).

*2 Cannot be written to/read from the module in a device memory editor.

How to input local devices

Prefix '#' to the device name (Example: #D10)

Creating comments for module access devices

Device comments within the following range can be created in the buffer memory (3E00H to 3E30H) of a CPU module in a multiple CPU system.

| Supported range | Unsupported range |
|----------------------------------|----------------------------------|
| U0 (IG0) to U1FF (IG268435455) | U200 (IG0) to U3DF (IG268435455) |
| U3E0 (IG0) to U3E3 (IG268435455) | |

Applicable devices in a safety project (safety devices)

○: Applicable, △: Display only, ×: Not applicable —: Not available

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory | Initial device value |
|----------------------|-------------------------|--------|---------------------|---------------------------|----------------|---------------|----------------------|
| Safety user device | Safety input | SAIX | ○ | — | ○ | △ | × |
| | Safety output | SAIY | ○ | — | ○ | △ | × |
| | Safety internal relay | SAIM | ○ | — | ○ | ○ | × |
| | | SA\#M | ○ | — | ○ | ○ | × |
| | Safety link relay | SAIB | ○ | — | ○ | ○ | × |
| | Safety timer | SAIT | — | × | ○ | ○ | × |
| | | SA\#T | — | × | ○ | ○ | × |
| | Safety retentive timer | SAIST | — | × | ○ | ○ | × |
| | | SA\#ST | — | × | ○ | ○ | × |
| | Safety counter | SAIC | — | × | ○ | ○ | × |
| | | SA\#C | — | × | ○ | ○ | × |
| | Safety data register | SAID | — | ○ | ○ | ○ | × |
| | | SA\#D | — | ○ | ○ | ○ | × |
| | Safety link register | SAIW | — | ○ | ○ | ○ | × |
| Safety system device | Safety special relay | SAISM | ○ | — | ○ | △ | × |
| | Safety special register | SAISD | — | ○ | ○ | ○ | × |

■How to input device

Global device: Prefix 'SAI' to the device name. (Example: SAI D10)

Local device: Prefix 'SA\#' to the device name. (Example: SA\#D10)

LHCPUs

○: Applicable, △: Display only, ×: Not applicable —: Not available

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory | Initial device value |
|---------------------------------|---------------------------------|----------------|---------------------|---------------------------|----------------|-----------------|----------------------|
| User device | Input | X | ○ | — | ○ | △ | × |
| | Output | Y | ○ | — | ○ | △ | × |
| | Internal relay | M | ○ | — | ○ | ○ | × |
| | | #M | ○ | — | ○ | ○ | × |
| | Latch relay | L | ○ | — | ○ | ○ | × |
| | Link relay | B | ○ | — | ○ | ○ | × |
| | Annunciator | F | ○ | — | ○ | ○ | × |
| | Link special relay | SB | ○ | — | ○ | △ | × |
| | Edge relay | V | ○ | — | ○ | ○ | × |
| | | #V | ○ | — | ○ | ○ | × |
| | Step relay | S ¹ | ○ | — | × | △ | × |
| | Timer | T | — | × | ○ | ○ | ○ |
| | | #T | — | × | ○ | ○ | ○ |
| | Retentive Timer | ST | — | × | ○ | ○ | ○ |
| | | #ST | — | × | ○ | ○ | ○ |
| | Long Timer | LT | — | × | ○ | ○ | ○ |
| | | #LT | — | × | ○ | ○ | ○ |
| | Long Retentive Timer | LST | — | × | ○ | ○ | ○ |
| | | #LST | — | × | ○ | ○ | ○ |
| | Counter | C | — | × | ○ | ○ | ○ |
| | | #C | — | × | ○ | ○ | ○ |
| | Long Counter | LC | — | × | ○ | ○ | ○ |
| | | #LC | — | × | ○ | ○ | ○ |
| | Data register | D | — | ○ | ○ | ○ | ○ |
| | | #D | — | ○ | ○ | ○ | ○ |
| | Link register | W | — | ○ | ○ | ○ | ○ |
| | Link special register | SW | — | ○ | ○ | ○ | ○ |
| | Direct access input | DX | — | | | | |
| | Direct access output | DY | — | | | | |
| System device | Function input | FX | — | | | | |
| | Function output | FY | — | | | | |
| | Function register | FD | — | | | | |
| | Special relay | SM | ○ | — | ○ | △ | × |
| | Special register | SD | — | ○ | ○ | ○ | ○ |
| Link direct device | Link input | J□X | ○ | — | ○ | △ ^{*2} | × |
| | Link output | J□Y | ○ | — | ○ | △ ^{*2} | × |
| | Link relay | J□B | ○ | — | ○ | △ ^{*2} | × |
| | Link special relay | J□SB | ○ | — | ○ | △ ^{*2} | × |
| | Link register | J□W | — | ○ | ○ | ○ ^{*2} | ○ |
| | Link special register | J□SW | — | ○ | ○ | ○ ^{*2} | ○ |
| Module access device | Module access device | U□G | — | ○ | ○ | ○ ^{*2} | ○ |
| CPU buffer memory access device | CPU buffer memory access device | U3E□G | — | ○ | ○ | ○ ^{*2} | ○ |
| | | U3E□HG | — | | | | |
| Index register | Index register | Z | — | × | × | ○ | × |
| | | #Z | — | | | | |
| | Long index register | LZ | — | × | × | ○ | × |
| | | #LZ | — | | | | |

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory | Initial device value |
|-----------------------|--|--------|---------------------|---------------------------|----------------|---------------|----------------------|
| File register | File register | R | — | ○ | ○ | × | × |
| | | ZR | — | ○ | ○ | ○ | ○ |
| Refresh data register | Refresh data register | RD | — | ○ | ○ | ○ | ○ |
| Nesting | Nesting | N | — | — | × | × | × |
| Pointer | Pointer | P | — | — | ○ | × | × |
| | | #P | — | — | ○ | × | × |
| | Interrupt pointer | I | — | — | ○ | × | × |
| Other devices | SFC block device | BL | — | — | ○ | × | × |
| | SFC transition device | TR | — | — | ○ | × | × |
| | Step relay (with block specification) | BL□\S | — | — | ○ | × | × |
| | SFC transition device (with block specification) | BL□\TR | — | — | ○ | × | × |
| | Network number specified device | J | — | — | ○ | × | × |
| | I/O number specified device | U | — | — | ○ | × | × |
| Constant | Decimal constant | K | — | — | ○ | × | × |
| | Hexadecimal constant | H | — | — | ○ | × | × |
| | Real constant | E | — | — | ○ | × | × |
| | String constant | — | — | — | ○ | × | × |

*1 When editing it in other places except in a Zoom, specify a step relay with block specification (BL□\S).

*2 Cannot be written to/read from the module in a device memory editor.

How to input local devices

Prefix '#' to the device name (Example: #D10)

Creating comments for module access devices

Device comments within the following range can be created in the buffer memory (3E00H to 3E30H) of a CPU module.

| Supported range | Unsupported range |
|----------------------------------|----------------------------------|
| U0 (IG0) to U1FF (IG268435455) | U200 (IG0) to U3DF (IG268435455) |
| U3E0 (IG0) to U3E3 (IG268435455) | |

A

FX5CPUs

○: Applicable, △: Display only, ×: Not applicable —: Not available

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory | Initial device value | Memory dump |
|---------------------------------|---------------------------------|-------------|---------------------|---------------------------|----------------|---------------|----------------------|-------------|
| User device | Input | X | ○ | — | ○ | △ | × | ○ |
| | Output | Y | ○ | — | ○ | △ | × | ○ |
| | Internal relay | M | ○ | — | ○ | ○ | × | ○ |
| | | #M | — | | | | | |
| | Latch relay | L | ○ | — | ○ | ○ | × | ○ |
| | Link relay | B | ○ | — | ○ | ○ | × | ○ |
| | Annunciator | F | ○ | — | ○ | ○ | × | ○ |
| | Link special relay | SB | ○ | — | ○ | △ | × | ○ |
| | Edge relay | V | — | | | | | |
| | | #V | — | | | | | |
| | Step relay | S*1 | ○ | — | ○ | ○*2 | × | ○ |
| | Timer | T | — | × | ○ | ○ | ○ | ○ |
| | | #T | — | | | | | |
| | Retentive timer | ST | — | × | ○ | ○ | ○ | ○ |
| | | #ST | — | | | | | |
| | Long Timer | LT | — | | | | | |
| | | #LT | — | | | | | |
| | Long Retentive Timer | LST | — | | | | | |
| | | #LST | — | | | | | |
| | Counter | C | — | × | ○ | ○ | ○ | ○ |
| | | #C | — | | | | | |
| | Long counter | LC | — | × | ○ | ○ | ○ | ○ |
| | | #LC | — | | | | | |
| | Data register | D | — | ○ | ○ | ○ | ○ | ○ |
| | | #D | — | | | | | |
| | Link register | W | — | ○ | ○ | ○ | ○ | ○ |
| | Link special register | SW | — | ○ | ○ | ○ | ○ | ○ |
| | Direct access input | DX | — | | | | | |
| | Direct access output | DY | — | | | | | |
| System device | Function input | FX | — | | | | | |
| | Function output | FY | — | | | | | |
| | Function register | FD | — | | | | | |
| | Special relay | SM | ○ | — | ○ | △ | × | ○ |
| | Special register | SD | — | ○ | ○ | ○ | ○ | ○ |
| Link direct device | Link input | J□X | — | | | | | |
| | Link output | J□Y | — | | | | | |
| | Link relay | J□B | — | | | | | |
| | Link special relay | J□SB | — | | | | | |
| | Link register | J□W | — | | | | | |
| | Link special register | J□SW | — | | | | | |
| Module access device | Module access device | U□IG*3 | — | ○ | ○ | ○*4 | ○ | × |
| CPU buffer memory access device | CPU buffer memory access device | U3E□IG | — | | | | | |
| | | U3E□IH G | — | | | | | |
| Index register | Index register | Z | — | × | × | ○ | × | ○ |
| | | #Z | — | | | | | |
| | Long index register | LZ | — | × | × | ○ | × | ○ |
| | | #LZ | — | | | | | |

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory | Initial device value | Memory dump |
|-----------------------|--|--------|---------------------|---------------------------|----------------|---------------|----------------------|-------------|
| File register | File register | R | — | ○ | ○ | ○ | ○ | ○ |
| | | ZR | — | | | | | |
| | Extended file register | ER | — | ○ | × | ○ | × | × |
| Refresh data register | Refresh data register | RD | — | | | | | |
| Nesting | Nesting | N | — | — | × | × | × | × |
| Pointer | Pointer | P | — | — | ○ | × | × | × |
| | | #P | — | | | | | |
| | Interrupt pointer | I | — | — | ○ | × | × | × |
| Others | SFC block device | BL | — | — | ○ | × | × | × |
| | SFC transition device | TR | — | — | × | × | × | × |
| | Step relay (with block specification) | BL□\S | — | — | ○ | × | × | ○ |
| | SFC transition device (with block specification) | BL□\TR | — | — | ○ | × | × | × |
| | Network number specified device | J | — | | | | | |
| | I/O number specified device | U | — | — | ○ | × | × | × |
| Constant | Decimal constant | K | — | | | | | |
| | Hexadecimal constant | H | — | | | | | |
| | Real constant | E | — | | | | | |
| | String constant | — | — | | | | | |

*1 Specify a step relay with block specification (BL□\S) to edit the S device in other than a Zoom if "Use" is set in "To Use or Not to Use SFC" of the CPU parameter.

*2 A step relay (S) is used as a step relay with block specification (BL□\S) to control an SFC program if "Use" is set in "To Use or Not to Use SFC" of the CPU parameter.

Therefore, the step relay (S) is treated as a read-only device.

*3 FX5SCPUs do not support it.

*4 Cannot be written to/read from the module in a device memory editor.

Creating comments for module access devices

Device comments can be created within the range of U01 (\G0) to U10 (\G262143).

Remote head modules

○: Applicable, △: Display only, ×: Not applicable —: Not available

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory |
|---------------------------------|---------------------------------|---------|---------------------|---------------------------|----------------|---------------|
| User device | Input | X | ○ | — | ○ | △ |
| | Output | Y | ○ | — | ○ | △ |
| | Internal relay | M | — | | | |
| | | #M | — | | | |
| | Latch relay | L | — | | | |
| | Link relay | B | — | | | |
| | Annunciator | F | — | | | |
| | Link special relay | SB | ○ | — | ○ | △ |
| | Edge relay | V | — | | | |
| | | #V | — | | | |
| | Step relay | S | — | | | |
| | Timer | T | — | | | |
| | | #T | — | | | |
| | Retentive timer | ST | — | | | |
| | | #ST | — | | | |
| | Long timer | LT | — | | | |
| | | #LT | — | | | |
| | Long retentive timer | LST | — | | | |
| | | #LST | — | | | |
| | Counter | C | — | | | |
| | | #C | — | | | |
| | Long counter | LC | — | | | |
| | | #LC | — | | | |
| | Data register | D | — | | | |
| | | #D | — | | | |
| | Link register | W | — | ○ | ○ | ○ |
| | Link special register | SW | — | ○ | ○ | ○ |
| | Direct access input | DX | ○ | — | × | × |
| | Direct access output | DY | ○ | — | × | × |
| System device | Function input | FX | — | | | |
| | Function output | FY | — | | | |
| | Function register | FD | — | | | |
| | Special relay | SM | ○ | — | ○ | △ |
| | Special register | SD | — | ○ | ○ | ○ |
| Link direct device | Link input | J□\X | — | | | |
| | Link output | J□\Y | — | | | |
| | Link relay | J□\B | — | | | |
| | Link special relay | J□\SB | — | | | |
| | Link register | J□\W | — | | | |
| | Link special register | J□\SW | — | | | |
| Module access device | Module access device | U□\G | — | ○ | ○ | ○*1 |
| CPU buffer memory access device | CPU buffer memory access device | U3E□\G | — | ○ | × | × |
| | | U3E□\HG | — | | | |
| Index register | Index register | Z | — | | | |
| | | #Z | — | | | |
| | Long index register | LZ | — | | | |
| | | #LZ | — | | | |

| Category | Device name | Symbol | Digit specification | Bit-specified word device | Device comment | Device memory |
|-----------------------|--|--------|---------------------|---------------------------|----------------|---------------|
| File register | File register | R | — | ○ | × | × |
| | | ZR | — | ○ | × | × |
| Refresh data register | Refresh data register | RD | — | ○ | ○ | ○ |
| Nesting | Nesting | N | — | | | |
| Pointer | Pointer | P | — | | | |
| | | #P | — | | | |
| | Interrupt pointer | I | — | | | |
| Other devices | SFC block device | BL | — | | | |
| | SFC transition device | TR | — | | | |
| | Step relay (with block specification) | BL□S | — | | | |
| | SFC transition device (with block specification) | BL□TR | — | | | |
| | Network number specified device | J | — | — | × | × |
| | I/O number specified device | U | — | — | × | × |
| Constant | Decimal constant | K | — | | | |
| | Hexadecimal constant | H | — | | | |
| | Real constant | E | — | | | |
| | String constant | — | — | | | |

*1 Cannot be written to/read from the module in a device memory editor.

Appendix 6 Label Memory Types

The label memory are used by a system for label assignment.

The following table shows the label memory types that are displayed in GX Works3.

| Symbol | Description |
|--------|---|
| GV: | The label memory assigned to a global label other than the pointer type. |
| UV: | The label memory assigned to a module label. |
| LV: | The label memory assigned to a local label other than the pointer type. |
| LLV: | The label memory assigned to a local latch label, which is a latch attribute local label of a function block. |
| LLP | The label memory assigned to a pointer type local label. |
| GLP | The label memory assigned to a pointer type global label. |

Precautions

In GX Works3, the address of label memory assigned to a label may be displayed; however, this address cannot be directly used by a user.

MEMO

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Appendix 7 Replacement of Another Format Project

When using another format project in the GX Works3 format, some instructions, devices, and programs are required to be replaced. Check the contents in this section, and correct the project.

Replacement of a GX Works2 format project

The following explains the methods for replacing data to use a GX Works2 format project in the GX Works3 format.

To use a GX Works2 format project for an FXCPU in the GX Works3 format, refer to the following:

 Transition from MELSEC FX3G, FX3U, FX3UC Series to MELSEC iQ-F Series Handbook

For details on the conversion processing for each data, refer to the following:

 Page 110 Opening a GX Works2 format project

Correcting parameters

The device/label automatic-assign settings in a GX Works2 format project are applied to "Label Area Capacity," "Latch Label Area Capacity," and "Latch Type Setting of Latch Type Label" of "CPU Parameter" in a GX Works3 format project.

However, depending on a GX Works2 format project, the settings may not be applied.


In that case, check the changes in the "Output" window, and set "CPU Parameter" depending on the label capacity of the project.

The setting items for a GX Works3 format project corresponding to that for a GX Works2 format project are as follows.

| GX Works2 | | GX Works3 | |
|--|---------------------------------------|--|--|
| Project | Device/label automatic-assign setting | CPU parameter | Setting content |
| <ul style="list-style-type: none">Simple project with labelsStructured project | Total points (VAR) | Label area capacity | The settings are applied. |
| | Total points (VAR_RETAIN) | Latch label area capacity | |
| | Latch selection column (latch type) | Latch type setting of latch type label | <ul style="list-style-type: none">When all the latch types of each data type^{*1} are the same, the settings are applied.When a latch type is different between these data types^{*1}, "Latch(1)" is set. |
| <ul style="list-style-type: none">Simple project with no labelsA project in which the value of "Use Volume" exceeds that of "Total Capacity" in the "Device/Label Memory Configuration" screen in GX Works3.^{*2,*3}A project created in GX Works2 Version 1.570U or earlier | Total points (VAR) | Label area capacity | "0 K word" is set. |
| | Total points (VAR_RETAIN) | Latch label area capacity | |
| | Latch selection column (latch type) | Latch type setting of latch type label | "Latch(1)" is set. |

*1 Word device, bit device, timer, retentive timer, and counter

*2 For details on the device/label memory, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

*3 The "Device/Label Memory Configuration" screen appears when "Device/Label Memory Configuration Confirmation" is clicked in "CPU Parameter."

Automatic replacement of elements (GX Works3 Version 1.047Z or later)

Many of the elements (instructions, standard functions, and standard function blocks) used in a GX Works2 format project are automatically replaced with ones available in GX Works3.

For some of these elements, however, the data type and the order of arguments are different between GX Works2 and GX Works3. Therefore, correcting the data type and the order of arguments is required to avoid an error at the program conversion. (☞ Page 953 Replacement of instructions (GX Works3 Version 1.040S or later))

In addition, elements not supported by MELSEC iQ-R series or MELSEC iQ-L series modules cannot be replaced with ones available in GX Works3. (☞ Page 946 Elements that are not supported by MELSEC iQ-R series or MELSEC iQ-L series modules)

■Elements to be replaced automatically (for compatibility use)

The following table shows the elements (instructions, standard functions, and standard function blocks) of ST and FBD/LD programs that are automatically replaced.

The elements to which "_M2" is added to their names are the replacements for elements of a GX Works2 format project.

Therefore, the instruction specifications are not described in the manual for each CPU module.

To create a program in GX Works3, use an element with the name before the replacement, and check the instruction specifications in the manual for each CPU module.

| Name before replacement → Name after replacement | | |
|--|--|--------------------------------------|
| - → MINUS_M2 | -P → MINUSP_M2 | * → MULTI_M2 |
| *P → MULTIP_M2 | / → DIVISION_M2 | /P → DIVISIONP_M2 |
| + → PLUS_M2 | +P → PLUSP_M2 | ABRST1_M → Z_ABRST1_M2 |
| ABRST2_M → Z_ABRST2_M2 | ABRST3_M → Z_ABRST3_M2 | ABRST4_M → Z_ABRST4_M2 |
| ABS_E → ABS_E_M2 | ACOS → ACOS_M2 | ACOS_E → ACOS_E_M2 |
| ACOS_E_MD → ACOS_M2 | ACOS_MD → ACOS_M2 | ACOSD → ACOSD_M2 |
| ACOSD_E_MD → ACOSD_M2 | ACOSD_MD → ACOSD_M2 | ADD_E → ADD_E_M2 |
| ADD_TIME_E → ADD_TIME_E_M2 | AND_E → AND_E_M2 | AND_EQ_M → AND_EQ_M2 |
| AND_GE_M → AND_GE_M2 | AND_GT_M → AND_GT_M2 | AND_LE_M → AND_LE_M2 |
| AND_LT_M → AND_LT_M2 | AND_NE_M → AND_NE_M2 | AND< → AND_LT_M2 |
| AND<= → AND_LE_M2 | AND<> → AND_NE_M2 | AND= → AND_EQ_M2 |
| AND> → AND_GT_M2 | AND>= → AND_GE_M2 | ANDD_EQ_M → ANDD_EQ_M2 |
| ANDD_GE_M → ANDD_GE_M2 | ANDD_GT_M → ANDD_GT_M2 | ANDD_LE_M → ANDD_LE_M2 |
| ANDD_LT_M → ANDD_LT_M2 | ANDD_NE_M → ANDD_NE_M2 | ANDD< → ANDD_LT_M2 |
| ANDD<= → ANDD_LE_M2 | ANDD<> → ANDD_NE_M2 | ANDD= → ANDD_EQ_M2 |
| ANDD> → ANDD_GT_M2 | ANDD>= → ANDD_GE_M2 | ASIN → ASIN_M2 |
| ASIN_E → ASIN_E_M2 | ASIN_E_MD → ASIN_M2 | ASIN_MD → ASIN_M2 |
| ASIND → ASIND_M2 | ASIND_E_MD → ASIND_M2 | ASIND_MD → ASIND_M2 |
| ATAN → ATAN_M2 | ATAN_E → ATAN_E_M2 | ATAN_E_MD → ATAN_M2 |
| ATAN_MD → ATAN_M2 | ATAND → ATAND_M2 | ATAND_E_MD → ATAND_M2 |
| ATAND_MD → ATAND_M2 | BAND → BAND_M2 | BAND_MD → BAND_M2 |
| BAND_P_MD → BANDP_M2 | BANDP → BANDP_M2 | BCD_TO_DINT_E → BCD_TO_DINT_E_M2 |
| BCD_TO_INT_E → BCD_TO_INT_E_M2 | BCD_TO_STR_E → BCD_TO_STR_E_M2 | BDSQR → BDSQR_M2 |
| BDSQRP → BDSQRP_M2 | BIDIN_M → G_BIDIN_M2 | BIDINP_M → GP_BIDIN_M2 |
| BIDOUT_M → G_BIDOUT_M2 | BIDOUTP_M → GP_BIDOUT_M2 | BINDA → BINDA_M2 |
| BINDA_K_MD → BINDA_M2 | BINDA_K_P_MD → BINDAP_M2 | BINDA_MD → BINDA_M2 |
| BINDA_P_MD → BINDAP_M2 | BINDA_P_S_MD → BINDAP_M2 | BINDA_S_MD → BINDA_M2 |
| BINDAP → BINDAP_M2 | BITARR_TO_DINT_E → BITARR_TO_DINT_E_M2 | BITARR_TO_INT_E → BITARR_TO_INT_E_M2 |
| BK-P → BKMINUSP_M2 | BKCOMP_EQ_M → BKCOMP_EQ_M2 | BKCOMP_EQP_M → BKCOMP_EQP_M2 |
| BK+ → BKPLUS_M2 | BK+P → BKPLUSP_M2 | BK- → BKMINUS_M2 |
| BKCOMP_GE_M → BKCOMP_GE_M2 | BKCOMP_GEP_M → BKCOMP_GEP_M2 | BKCOMP_GT_M → BKCOMP_GT_M2 |
| BKCOMP_GTP_M → BKCOMP_GTP_M2 | BKCOMP_LE_M → BKCOMP_LE_M2 | BKCOMP_LEP_M → BKCOMP_LEP_M2 |
| BKCOMP_LT_M → BKCOMP_LT_M2 | BKCOMP_LTP_M → BKCOMP_LTP_M2 | BKCOMP_NE_M → BKCOMP_NE_M2 |
| BKCOMP_NEP_M → BKCOMP_NEP_M2 | BKCOMP< → BKCOMP_LT_M2 | BKCOMP<P → BKCOMP_LTP_M2 |

| Name before replacement → Name after replacement | | |
|--|---|---|
| BKCMPE => BKCMPE_M2 | BKCMPE=P → BKCMPE_LEP_M2 | BKCMPE<> → BKCMPE_NE_M2 |
| BKCMPE<>P → BKCMPE_NEP_M2 | BKCMPE= → BKCMPE_EQ_M2 | BKCMPE=P → BKCMPE_EQP_M2 |
| BKCMPE> → BKCMPE_GT_M2 | BKCMPE>P → BKCMPE_GTP_M2 | BKCMPE>= → BKCMPE_GE_M2 |
| BKCMPE>=P → BKCMPE_GEP_M2 | BKMINUS_M → BKMINUS_M2 | BKMINUSP_M → BKMINUSP_M2 |
| BKPLUS_M → BKPLUS_M2 | BKPLUSP_M → BKPLUSP_M2 | BKRST → BKRST_M2 |
| BKRST_M → BKRST_M2 | BKRSTP → BKRSTP_M2 | BKRSTP_M → BKRSTP_M2 |
| BOOL_TO_DINT_E → BOOL_TO_DINT_E_M2 | BOOL_TO_DWORD_E → BOOL_TO_DWORD_E_M2 | BOOL_TO_INT_E → BOOL_TO_INT_E_M2 |
| BOOL_TO_STR_E → BOOL_TO_STR_E_M2 | BOOL_TO_TIME_E → BOOL_TO_TIME_E_M2 | BOOL_TO_WORD_E → BOOL_TO_WORD_E_M2 |
| BSQR → BSQR_M2 | BSQRP → BSQRP_M2 | BUFRVCV_M → ZP_BUFRVCV_M2 |
| BUFSND_M → ZP_BUFSND_M2 | CLOSE_M → ZP_CLOSE_M2 | COS → COS_M2 |
| COS_E → COS_E_M2 | CONCAT_E → CONCAT_E_M2 | COS_E_MD → COS_M2 |
| COS_MD → COS_M2 | COSD → COSD_M2 | COSD_E_MD → COSD_M2 |
| COSD_MD → COSD_M2 | CPY_BIT_OF_INT_E → CPY_BIT_OF_INT_E_M2 | CPY_BITARR_E → CPY_BITARR_E_M2 |
| CSET_M → ZP_CSET_M2 | CSET_P_M → ZP_CSET_M2 | CTD → CTD_M2 ^{*1} |
| CTD_E → CTD_E_M2 ^{*1} | CTU → CTU_M2 ^{*1} | CTU_E → CTU_E_M2 ^{*1} |
| CTUD → CTUD_M2 ^{*1} | CTUD_E → CTUD_E_M2 ^{*1} | D-P → DMINUSP_M2 |
| DABIN_P_MD → DABINP_M2 | DABIN_P_S_MD → DABINP_M2 | D/ → DDIVISION_M2 |
| D/P → DDIVISIONP_M2 | DABIN → DABIN_M2 | D+ → DPLUS_M2 |
| D* → DMULTI_M2 | D*P → DMULTIP_M2 | DABIN_MD → DABIN_M2 |
| D+P → DPLUSP_M2 | D- → DMINUS_M2 | DABIN_S_MD → DABIN_M2 |
| DABINP → DABINP_M2 | DB* → DBMULTI_M2 | DB*P → DBMULTIP_M2 |
| DBAND → DBAND_M2 | DBAND_MD → DBAND_M2 | DBAND_P_MD → DBANDP_M2 |
| DBANDP → DBANDP_M2 | DBINDA → DBINDA_M2 | DBINDA_K_MD → DBINDA_M2 |
| DBINDA_K_P_MD → DBINDAP_M2 | DBINDA_MD → DBINDA_M2 | DBINDA_P_MD → DBINDAP_M2 |
| DBINDA_P_S_MD → DBINDAP_M2 | DBINDA_S_MD → DBINDA_M2 | DBINDAP → DBINDAP_M2 |
| DBK-P → DBKMINUSP_M2 | DBKCMPE_EQ_M → DBKCMPE_EQ_M2 | DBK- → DBKMINUS_M2 |
| DBKCMPE_GE_M → DBKCMPE_GE_M2 | DBKCMPE_GEP_M → DBKCMPE_GEP_M2 | DBKCMPE_EQP_M → DBKCMPE_EQP_M2 |
| DBK+ → DBKPLUS_M2 | DBK+P → DBKPLUSP_M2 | DBKCMPE_GT_M → DBKCMPE_GT_M2 |
| DBKCMPE_GTP_M → DBKCMPE_GTP_M2 | DBKCMPE_LE_M → DBKCMPE_LE_M2 | DBKCMPE_LEP_M → DBKCMPE_LEP_M2 |
| DBKCMPE_LT_M → DBKCMPE_LT_M2 | DBKCMPE_LTP_M → DBKCMPE_LTP_M2 | DBKCMPE_NE_M → DBKCMPE_NE_M2 |
| DBKCMPE_NEP_M → DBKCMPE_NEP_M2 | DBKCMPE< → DBKCMPE_LT_M2 | DBKCMPE<> → DBKCMPE_NE_M2 |
| DBKCMPE<>P → DBKCMPE_NEP_M2 | DBKCMPE= → DBKCMPE_EQ_M2 | DBKCMPE<P → DBKCMPE_LTP_M2 |
| DBKCMPE=> → DBKCMPE_LE_M2 | DBKCMPE=>P → DBKCMPE_LEP_M2 | DBKCMPE=P → DBKCMPE_EQP_M2 |
| DBKCMPE> → DBKCMPE_GT_M2 | DBKCMPE>P → DBKCMPE_GTP_M2 | DBKCMPE>= → DBKCMPE_GE_M2 |
| DBKCMPE>=P → DBKCMPE_GEP_M2 | DBKMINUS_M → DBKMINUS_M2 | DBKMINUSP_M → DBKMINUSP_M2 |
| DBKPLUS_M → DBKPLUS_M2 | DBKPLUSP_M → DBKPLUSP_M2 | DBMULTI_M → DBMULTI_M2 |
| DBMULTIP_M → DBMULTIP_M2 | DDABIN → DDABIN_M2 | DDABIN_MD → DDABIN_M2 |
| DDABIN_P_MD → DDABINP_M2 | DDABIN_P_S_MD → DDABINP_M2 | DDABIN_S_MD → DDABIN_M2 |
| DDABINP → DDABINP_M2 | DDEC → DDEC_M2 | DDEC_M → DDEC_M2 |
| DDECP → DDECP_M2 | DDECP_M → DDECP_M2 | DDIVID_3_M → DDIVISION_M2 |
| DDIVIDP_3_M → DDIVISIONP_M2 | DEC → DEC_M2 | DEC_M → DEC_M2 |
| DECP → DECP_M2 | DECP_M → DECP_M2 | DELETE_E → DELETE_E_M2 |
| DGBIN → DGBIN_M2 | DGBIN_M → DGBIN_M2 | DGBINP → DGBINP_M2 |
| DGBINP_M → DGBINP_M2 | DGRY → DGRY_M2 | DGRY_M → DGRY_M2 |
| DGRYP → DGRYP_M2 | DGRYP_M → DGRYP_M2 | DINC → DINC_M2 |
| DINC_M → DINC_M2 | DINCP → DINCP_M2 | DINCP_M → DINCP_M2 |
| DINT_TO_BITARR_E → DINT_TO_BITARR_E_M2 | DIV_TIME_E → DIV_TIME_E_M2 | DINT_TO_INT_E → DINT_TO_INT_E_M2 |
| DINT_TO_LREAL_E → DINT_TO_LREAL_E_M2 | DINT_TO_REAL_E → DINT_TO_REAL_E_M2 | DINT_TO_STR_E → DINT_TO_STR_E_M2 |
| DINT_TO_TIME_E → DINT_TO_TIME_E_M2 | DINT_TO_WORD_E → DINT_TO_WORD_E_M2 | DIV_E → DIV_E_M2 |
| DINT_TO_BCD_E → DINT_TO_BCD_E_M2 | DINT_TO_BOOL_E → DINT_TO_BOOL_E_M2 | DINT_TO_DWORD_E → DINT_TO_DWORD_E_M2 |

| Name before replacement → Name after replacement | | |
|--|---|---|
| DIVID_3_M → DIVISION_M2 | DIVIDP_3_M → DIVISIONP_M2 | DLIMIT → DLIMIT_M2 |
| DLIMIT_MD → DLIMIT_M2 | DLIMIT_P_MD → DLIMITP_M2 | DLIMITP → DLIMITP_M2 |
| DMAX → DMAX_M2 | DMAX_M → DMAX_M2 | DMAXP → DMAXP_M2 |
| DMAXP_M → DMAXP_M2 | DMEAN → DMEAN_M2 | DMEAN_M → DMEAN_M2 |
| DMEANP → DMEANP_M2 | DMEANP_M → DMEANP_M2 | DMIN → DMIN_M2 |
| DMIN_M → DMIN_M2 | DMINP → DMINP_M2 | DMINP_M → DMINP_M2 |
| DMINUS_3_M → DMINUS_M2 | DMINUS_M → DMINUS_2_M2 | DMINUSP_3_M → DMINUSP_M2 |
| DMINUSP_M → DMINUSP_2_M2 | DMULTI_3_M → DMULTI_M2 | DMULTIP_3_M → DMULTIP_M2 |
| DPLUS_3_M → DPLUS_M2 | DPLUS_M → DPLUS_2_M2 | DPLUSP_3_M → DPLUSP_M2 |
| DPLUSP_M → DPLUSP_2_M2 | DROL → DROL_M2 | DROL_M → DROL_M2 |
| DROR → DROR_M2 | DROR_M → DROR_M2 | DSCL → DSCL_M2 |
| DSCL2 → DSCL2_M2 | DSCL2P → DSCL2P_M2 | DSCLP → DSCLP_M2 |
| DSORT → DSORT_M2 | DSORT_M → DSORT_M2 | DSTR → DSTR_M2 |
| DSTR_K_MD → DSTR_M2 | DSTR_K_P_MD → DSTRP_M2 | DSTR_MD → DSTR_M2 |
| DSTR_P_MD → DSTRP_M2 | DSTR_P_S_MD → DSTRP_M2 | DSTR_S_MD → DSTR_M2 |
| DSTRP → DSTRP_M2 | DTO → DTO_M2 | DTO_M → DTO_M2 |
| DTOP → DTOP_M2 | DTOP_M → DTOP_M2 | DVAL → DVAL_M2 |
| DVAL_MD → DVAL_M2 | DVAL_P_MD → DVALP_M2 | DVAL_P_S_MD → DVALP_M2 |
| DVAL_S_MD → DVAL_M2 | DVALP → DVALP_M2 | DWORD_TO_BOOL_E → DWORD_TO_BOOL_E_M2 |
| DWORD_TO_DINT_E → DWORD_TO_DINT_E_M2 | DWORD_TO_INT_E → DWORD_TO_INT_E_M2 | DWORD_TO_STR_E → DWORD_TO_STR_E_M2 |
| DWORD_TO_TIME_E → DWORD_TO_TIME_E_M2 | DWORD_TO_WORD_E → DWORD_TO_WORD_E_M2 | DWSUM → DWSUM_M2 |
| DWSUM_M → DWSUM_M2 | DWSUMP → DWSUMP_M2 | DWSUMP_M → DWSUMP_M2 |
| DZONE → DZONE_M2 | DZONE_MD → DZONE_M2 | DZONE_P_MD → DZONEP_M2 |
| DZONEP → DZONEP_M2 | EQ_E → EQ_E_M2 | EREXP → EREXP_M2 |
| EREXP_M → EREXP_M2 | EREXPP → EREXP_M2 | EREXPP_M → EREXP_M2 |
| ERRCLR_M → ZP_ERRCLR_M2 | ERRRD_M → ZP_ERRRD_M2 | EXP → EXP_M2 |
| EXP_E → EXP_E_M2 | EXP_E_MD → EXP_M2 | EXP_MD → EXP_M2 |
| EXPD → EXPD_M2 | EXPD_E_MD → EXPD_M2 | EXPD_MD → EXPD_M2 |
| EXPT_E → EXPT_E_M2 | F_TRIG → F_TRIG_M2 ^{*1} | F_TRIG_E → F_TRIG_E_M2 ^{*1} |
| FIND_E → FIND_E_M2 | G_BIDIN → G_BIDIN_M2 | G_BIDOUT → G_BIDOUT_M2 |
| G_CCASET → G_CCASET_M2 | G_CPRTCL → G_CPRTCL_M2 | G_GETE → G_GETE_M2 |
| G_INPUT → G_INPUT_M2 | G_OGLOAD → G_OGLOAD_M2 | G_OGSTOR → G_OGSTOR_M2 |
| G_ONDEMAND → G_ONDEMAND_M2 | G_OUTPUT → G_OUTPUT_M2 | G_PRR → G_PRR_M2 |
| G_PUTE → G_PUTE_M2 | G_RDMSG → G_RDMSG_M2 | G_REQ → G_REQ_M2 |
| G_RIRCV → G_RIRCV_M2 | G_RIRD → G_RIRD_M2 | G_RISEND → G_RISEND_M2 |
| G_RITO → G_RITO_M2 | G_RIWT → G_RIWT_M2 | G_RLPASET → G_RLPASET_M2 |
| G_SPBUSY → G_SPBUSY_M2 | GBIN → GBIN_M2 | GBIN_M → GBIN_M2 |
| GBINP → GBINP_M2 | GBINP_M → GBINP_M2 | GE_E → GE_E_M2 |
| GET_BIT_OF_INT_E → GET_BIT_OF_INT_E_M2 | GETE_M → G_GETE_M2 | GETEP_M → GP_GETE_M2 |
| GP_BIDIN → GP_BIDIN_M2 | GP_BIDOUT → GP_BIDOUT_M2 | GP_CCASET → GP_CCASET_M2 |
| GP_CPRTCL → GP_CPRTCL_M2 | GP_ECPRTCL → GP_ECPRTCL_M2 | GP_GETE → GP_GETE_M2 |
| GP_OGLOAD → GP_OGLOAD_M2 | GP_OGSTOR → GP_OGSTOR_M2 | GP_ONDEMAND → GP_ONDEMAND_M2 |
| GP_OUTPUT → GP_OUTPUT_M2 | GP_PRR → GP_PRR_M2 | GP_PUTE → GP_PUTE_M2 |
| GP_RDMSG → GP_RDMSG_M2 | GP_RECV → GP_RECV_M2 | GP_REQ → GP_REQ_M2 |
| GP_RIRCV → GP_RIRCV_M2 | GP_RIRD → GP_RIRD_M2 | GP_RISEND → GP_RISEND_M2 |
| GP_RITO → GP_RITO_M2 | GP_RIWT → GP_RIWT_M2 | GP_RLPASET → GP_RLPASET_M2 |
| GP_SEND → GP_SEND_M2 | GP_SPBUSY → GP_SPBUSY_M2 | GRY → GRY_M2 |
| GRY_M → GRY_M2 | GRYP → GRYP_M2 | GRYP_M → GRYP_M2 |
| GT_E → GT_E_M2 | INC → INC_M2 | INC_M → INC_M2 |
| INCP → INCP_M2 | INCP_M → INCP_M2 | INPUT_M → G_INPUT_M2 |
| INSERT_E → INSERT_E_M2 | INT_TO_BCD_E → INT_TO_BCD_E_M2 | INT_TO_BITARR_E → INT_TO_BITARR_E_M2 |

| Name before replacement → Name after replacement | | |
|--|---|---|
| INT_TO_BOOL_E → INT_TO_BOOL_E_M2 | INT_TO_DINT_E → INT_TO_DINT_E_M2 | INT_TO_DWORD_E → INT_TO_DWORD_E_M2 |
| INT_TO_LREAL_E → INT_TO_LREAL_E_M2 | INT_TO_REAL_E → INT_TO_REAL_E_M2 | INT_TO_STR_E → INT_TO_STR_E_M2 |
| INT_TO_TIME_E → INT_TO_TIME_E_M2 | INT_TO_WORD_E → INT_TO_WORD_E_M2 | LD_EQ_M → LD_EQ_M2 |
| LD_GE_M → LD_GE_M2 | LD_GT_M → LD_GT_M2 | LD_LE_M → LD_LE_M2 |
| LD_LT_M → LD_LT_M2 | LD_NE_M → LD_NE_M2 | LD< → LD_LT_M2 |
| LD<= → LD_LE_M2 | LD<> → LD_NE_M2 | LD= → LD_EQ_M2 |
| LD> → LD_GT_M2 | LD>= → LD_GE_M2 | LDD_EQ_M → LDD_EQ_M2 |
| LDD_GE_M → LDD_GE_M2 | LDD_GT_M → LDD_GT_M2 | LDD_LE_M → LDD_LE_M2 |
| LDD_LT_M → LDD_LT_M2 | LDD_NE_M → LDD_NE_M2 | LDD< → LDD_LT_M2 |
| LDD<= → LDD_LE_M2 | LDD<> → LDD_NE_M2 | LDD= → LDD_EQ_M2 |
| LDD> → LDD_GT_M2 | LDD>= → LDD_GE_M2 | LE_E → LE_E_M2 |
| LEFT → LEFT_M2 | LEFT_E → LEFT_E_M2 | LEFT_M → LEFT_M2 |
| LEN → LEN_M2 | LEN_E → LEN_E_M2 | LEN_MD → LEN_M2 |
| LEN_S → LEN_M2 | LEN_S_MD → LEN_M2 | LIMIT → LIMIT_M2 |
| LIMIT_MD → LIMIT_M2 | LIMIT_E → LIMITATION_E_M2 | LIMIT_P_MD → LIMITP_M2 |
| LIMITATION_E → LIMITATION_E_M2 | LIMITP → LIMITP_M2 | LN_E → LN_E_M2 |
| LOG → LOG_M2 | LOG_E → LOG_E_M2 | LOG_E_MD → LOG_M2 |
| LOG_MD → LOG_M2 | LOGD → LOGD_M2 | LOGD_E_MD → LOGD_M2 |
| LOGD_MD → LOGD_M2 | LREAL_TO_DINT_E → LREAL_TO_DINT_E_M2 | LREAL_TO_INT_E → LREAL_TO_INT_E_M2 |
| LREAL_TO_REAL_E → LREAL_TO_REAL_E_M2 | LT_E → LT_E_M2 | MAX_E → MAXIMUM_E_M2 |
| MAX_M → MAX_M2 | M_REAL_TO_REAL_E → M_REAL_TO_REAL_E_M2 | MAX → MAX_M2 |
| MAXP_M → MAXP_M2 | MAXIMUM_E → MAXIMUM_E_M2 | MAXP → MAXP_M2 |
| MEANP → MEANP_M2 | MEAN → MEAN_M2 | MEAN_M → MEAN_M2 |
| MIN → MIN_M2 | MEANP_M → MEANP_M2 | MID_E → MID_E_M2 |
| MINP → MINP_M2 | MIN_M → MIN_M2 | MINIMUM_E → MINIMUM_E_M2 |
| MINUS_M → MINUS_2_M2 | MINP_M → MINP_M2 | MINUS_3_M → MINUS_M2 |
| MOD_E → MOD_E_M2 | MINUSP_3_M → MINUSP_M2 | MINUSP_M → MINUSP_2_M2 |
| MUL_TIME_E → MUL_TIME_E_M2 | MOVE_E → MOVE_E_M2 | MUL_E → MUL_E_M2 |
| MUX_E → MUX_E_M2 | MULTI_3_M → MULTI_M2 | MULTIP_3_M → MULTIP_M2 |
| OGLOAD_U_M → G_OGLOAD_M2 | NE_E → NE_E_M2 | NOT_E → NOT_E_M2 |
| OGSTOR_UP_M → GP_OGSTOR_M2 | OGLOAD_UP_M → GP_OGLOAD_M2 | OGSTOR_U_M → G_OGSTOR_M2 |
| OPEN_M → ZP_OPEN_M2 | ONDEMAND_M → G_ONDEMAND_M2 | ONDEMANDP_M → GP_ONDEMAND_M2 |
| OR_E → OR_E_M2 | OR_EQ_M → OR_EQ_M2 | OR_GE_M → OR_GE_M2 |
| OR_GT_M → OR_GT_M2 | OR_LE_M → OR_LE_M2 | OR_LT_M → OR_LT_M2 |
| OR_NE_M → OR_NE_M2 | OR< → OR_LT_M2 | OR<> → OR_NE_M2 |
| OR<= → OR_LE_M2 | OR= → OR_EQ_M2 | OR> → OR_GT_M2 |
| OR>= → OR_GE_M2 | ORD_EQ_M → ORD_EQ_M2 | ORD_GE_M → ORD_GE_M2 |
| ORD_GT_M → ORD_GT_M2 | ORD_GE → ORD_GE_M2 | ORD_LE_M → ORD_LE_M2 |
| ORD_LT_M → ORD_LT_M2 | ORD_NE_M → ORD_NE_M2 | ORD< → ORD_LT_M2 |
| ORD<= → ORD_LE_M2 | ORD<> → ORD_NE_M2 | ORD= → ORD_EQ_M2 |
| ORD> → ORD_GT_M2 | ORD>= → ORD_GE_M2 | OUTPUT_M → G_OUTPUT_M2 |
| OUTPUTP_M → GP_OUTPUT_M2 | PFWRT_P_M → ZP_PFWRT_M2 | PINIT_M → ZP_PINIT_M2 |
| PINIT_P_M → ZP_PINIT_M2 | PLUS_3_M → PLUS_M2 | PLUS_M → PLUS_2_M2 |
| PLUSP_3_M → PLUSP_M2 | PLUSP_M → PLUSP_2_M2 | PRR_M → G_PRR_M2 |
| PRRP_M → GP_PRR_M2 | PSTRT1_P_M → ZP_PSTRT1_M2 | PSTRT2_P_M → ZP_PSTRT2_M2 |
| PSTRT3_P_M → ZP_PSTRT3_M2 | PSTRT4_P_M → ZP_PSTRT4_M2 | PUTE_M → G_PUTE_M2 |
| PUTEP_M → GP_PUTE_M2 | R_TRIG → R_TRIG_M2 ^{*1} | R_TRIG_E → R_TRIG_E_M2 ^{*1} |
| RDMSG_MD → G_RDMSG_M2 | RDMSG_P_MD → GP_RDMSG_M2 | REAL_TO_DINT_E → REAL_TO_DINT_E_M2 |
| REAL_TO_INT_E → REAL_TO_INT_E_M2 | REAL_TO_LREAL_E → REAL_TO_LREAL_E_M2 | REAL_TO_M_REAL_E → REAL_TO_M_REAL_E_M2 |
| REAL_TO_STR_E → REAL_TO_STR_E_M2 | RECV_UP_M → GP_RECV_M2 | RECV_P_M → GP_RECV_M2 |
| RECVS_U_M → Z_RECVS_M2 | REMTO_P_MD → ZP_REMTO_M2 | REPLACE_E → REPLACE_E_M2 |

| Name before replacement → Name after replacement | | |
|--|--|--|
| REQ_M → G_REQ_M2 | REQ_U_M → G_REQ_M2 | REQ_UP_M → GP_REQ_M2 |
| REQP_M → GP_REQ_M2 | RIGHT → RIGHT_M2 | RIGHT_E → RIGHT_E_M2 |
| RIGHT_M → RIGHT_M2 | RIRCV_MD → G_RIRCV_M2 | RIRCV_P_MD → GP_RIRCV_M2 |
| RIRD_MD → G_RIRD_M2 | RIRD_P_MD → GP_RIRD_M2 | RISEND_MD → G_RISEND_M2 |
| RISEND_P_MD → GP_RISEND_M2 | RITO_MD → G_RITO_M2 | RITO_P_MD → GP_RITO_M2 |
| RIWT_MD → G_RIWT_M2 | RIWT_P_MD → GP_RIWT_M2 | RLPASET_MD → G_RLPASET_M2 |
| RLPASET_P_MD → GP_RLPASET_M2 | ROL → ROL_M2 | ROL_E → ROL_E_M2 |
| ROL_M → ROL_M2 | ROR → ROR_M2 | ROR_E → ROR_E_M2 |
| ROR_M → ROR_M2 | RS → RS_M2 ^{*1} | RS_E → RS_E_M2 ^{*1} |
| SCL → SCL_M2 | SCL2 → SCL2_M2 | SCL2P → SCL2P_M2 |
| SCLP → SCLP_M2 | SEL_E → SEL_E_M2 | SEND_4_P_M → GP_SEND_M2 |
| SEND_UP_M → GP_SEND_M2 | SET_BIT_OF_INT_E → SET_BIT_OF_INT_E_M2 | SHL_E → SHL_E_M2 |
| SHR_E → SHR_E_M2 | SIN → SIN_M2 | SIN_E → SIN_E_M2 |
| SIN_E_MD → SIN_M2 | SIN_MD → SIN_M2 | SIND → SIND_M2 |
| SIND_E_MD → SIND_M2 | SIND_MD → SIND_M2 | SORT → SORT_M2 |
| SORT_M → SORT_M2 | SPBUSY_MD → G_SPBUSY_M2 | SPBUSY_P_MD → GP_SPBUSY_M2 |
| SQRT_E → SQRT_E_M2 | SR → SR_M2 ^{*1} | SR_E → SR_E_M2 ^{*1} |
| STR → STR_M2 | STR_K_MD → STR_M2 | STR_K_P_MD → STRP_M2 |
| STR_MD → STR_M2 | STR_P_MD → STRP_M2 | STR_P_S_MD → STRP_M2 |
| STR_S_MD → STR_M2 | STR_TO_BCD_E → STR_TO_BCD_E_M2 | STR_TO_BOOL_E → STR_TO_BOOL_E_M2 |
| STR_TO_DINT_E → STR_TO_DINT_E_M2 | STR_TO_DWORD_E → STR_TO_DWORD_E_M2 | STR_TO_INT_E → STR_TO_INT_E_M2 |
| STR_TO_REAL_E → STR_TO_REAL_E_M2 | STR_TO_TIME_E → STR_TO_TIME_E_M2 | STR_TO_WORD_E → STR_TO_WORD_E_M2 |
| STRP → STRP_M2 | SUB_E → SUB_E_M2 | SUB_TIME_E → SUB_TIME_E_M2 |
| SWAP → SWAP_M2 | SWAP_MD → SWAP_M2 | SWAP_P_MD → SWAPP_M2 |
| SWAPP → SWAPP_M2 | TAN → TAN_M2 | TAN_E → TAN_E_M2 |
| TAN_E_MD → TAN_M2 | TAN_MD → TAN_M2 | TAND → TAND_M2 |
| TAND_E_MD → TAND_M2 | TAND_MD → TAND_M2 | TEACH1_P_M → ZP_TEACH1_M2 |
| TEACH2_P_M → ZP_TEACH2_M2 | TEACH3_P_M → ZP_TEACH3_M2 | TEACH4_P_M → ZP_TEACH4_M2 |
| TIME_TO_BOOL_E → TIME_TO_BOOL_E_M2 | TIME_TO_DINT_E → TIME_TO_DINT_E_M2 | TIME_TO_DWORD_E → TIME_TO_DWORD_E_M2 |
| TIME_TO_INT_E → TIME_TO_INT_E_M2 | TIME_TO_STR_E → TIME_TO_STR_E_M2 | TIME_TO_WORD_E → TIME_TO_WORD_E_M2 |
| TO → TO_M2 | TO_M → TO_M2 | TOF_HIGH → TOF_HIGH_M2 ^{*1} |
| TOF_HIGH_E → TOF_HIGH_E_M2 ^{*1} | TON_HIGH → TON_HIGH_M2 ^{*1} | TON_HIGH_E → TON_HIGH_E_M2 ^{*1} |
| TOP → TOP_M2 | TOP_M → TOP_M2 | TP_HIGH → TP_HIGH_M2 ^{*1} |
| TP_HIGH_E → TP_HIGH_E_M2 ^{*1} | UINI_M → ZP_UINI_M2 | UINI_U_M → Z_UINI_M2 |
| UINI_UP_M → ZP_UINI_M2 | VAL → VAL_M2 | VAL_MD → VAL_M2 |
| VAL_P_MD → VALP_M2 | VAL_P_S_MD → VALP_M2 | VAL_S_MD → VAL_M2 |
| VALP → VALP_M2 | WORD_TO_BOOL_E → WORD_TO_BOOL_E_M2 | WORD_TO_DINT_E → WORD_TO_DINT_E_M2 |
| WORD_TO_DWORD_E → WORD_TO_DWORD_E_M2 | WORD_TO_INT_E → WORD_TO_INT_E_M2 | WORD_TO_STR_E → WORD_TO_STR_E_M2 |
| WORD_TO_TIME_E → WORD_TO_TIME_E_M2 | WSUM → WSUM_M2 | WSUM_M → WSUM_M2 |
| WSUMP → WSUMP_M2 | WSUMP_M → WSUMP_M2 | XOR_E → XOR_E_M2 |
| Z_ABRST1 → Z_ABRST1_M2 | Z_ABRST2 → Z_ABRST2_M2 | Z_ABRST3 → Z_ABRST3_M2 |
| Z_ABRST4 → Z_ABRST4_M2 | Z_RECVS → Z_RECVS_M2 | Z_UINI → Z_UINI_M2 |
| ZONE → ZONE_M2 | ZONE_MD → ZONE_M2 | ZONE_P_MD → ZONEP_M2 |
| ZONEP → ZONEP_M2 | ZP_BUFRVCV → ZP_BUFRVCV_M2 | ZP_BUFSND → ZP_BUFSND_M2 |
| ZP_CLOSE → ZP_CLOSE_M2 | ZP_CSET → ZP_CSET_M2 | ZP_ERRCLR → ZP_ERRCLR_M2 |
| ZP_ERRRD → ZP_ERRRD_M2 | ZP_OPEN → ZP_OPEN_M2 | ZP_PFWRT → ZP_PFWRT_M2 |
| ZP_PINIT → ZP_PINIT_M2 | ZP_PSTRT1 → ZP_PSTRT1_M2 | ZP_PSTRT2 → ZP_PSTRT2_M2 |
| ZP_PSTRT3 → ZP_PSTRT3_M2 | ZP_PSTRT4 → ZP_PSTRT4_M2 | ZP_REMTO → ZP_REMTO_M2 |
| ZP_TEACH1 → ZP_TEACH1_M2 | ZP_TEACH2 → ZP_TEACH2_M2 | ZP_TEACH3 → ZP_TEACH3_M2 |
| ZP_TEACH4 → ZP_TEACH4_M2 | ZP_UINI → ZP_UINI_M2 | — |


*1 Automatically replaced only when opening a GX Works2 format project in GX Works3 Version 1.055H or later.

■Elements that are not supported by MELSEC iQ-R series or MELSEC iQ-L series modules

If an instruction which is not supported by MELSEC iQ-R series or MELSEC iQ-L series modules is included in a program of a GX Works2 format project, the instruction will be replaced with one using SM4095/SD4095.

In addition, functions and function blocks that are unavailable in an ST program and an FBD/LD program of GX Works3 will be replaced with undefined ones.

Correct the program in GX Works3 by changing these elements to ones which are supported by these modules and have the equivalent functions. (MELSEC iQ-R series only)

 MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

Correcting element names and arguments (GX Works3 Version 1.046Y or earlier)

For some elements (instructions, functions, and function blocks), the data type of arguments differs between a GX Works2 format project and a GX Works3 format project.

If these elements are used in a GX Works2 format project, a conversion error may occur in GX Works3 Version 1.046Y or earlier. In that case, replace their element names and arguments.

When opening a GX Works2 format project in GX Works3 Version 1.047Z or later, the replacements shown in this section is not required.

For details, refer to the following:

 Page 941 Automatic replacement of elements (GX Works3 Version 1.047Z or later)

In addition, instructions which are not supported by MELSEC iQ-R series or MELSEC iQ-L series modules cannot be replaced with ones available in GX Works3. Refer to the following and correct the instructions.

 Page 946 Elements that are not supported by MELSEC iQ-R series or MELSEC iQ-L series modules

The following table, that indicates the replacement method, is not applied to a ladder program.

■Instructions in which the names need to be replaced

| Names that need to be replaced → names after replacement | | | |
|--|---------------------|---------------------|---------------------|
| BAND → BAND_U | BANDP → BANDP_U | BINDA → BINDA_U | BINDAP → BINDAP_U |
| DABIN → DABIN_U | DABINP → DABINP_U | DBAND → DBAND_U | DBANDP → DBANDP_U |
| DBINDA → DBINDA_U | DBINDAP → DBINDAP_U | DDABIN → DDABIN_U | DDABINP → DDABINP_U |
| DDEC → DDEC_U | DDECP → DDECP_U | DEC → DEC_U | DECP → DECP_U |
| DGBIN → DGBIN_U | DGBINP → DGBINP_U | DGRY → DGRY_U | DGRYP → DGRYP_U |
| DINC → DINC_U | DINCP → DINCP_U | DLIMITP → DLIMITP_U | DMAXP → DMAXP_U |
| DMEAN → DMEAN_U | DMEANP → DMEANP_U | DMINP → DMINP_U | DSCL → DSCL_U |
| DSCL2 → DSCL2_U | DSCL2P → DSCL2P_U | DSCLP → DSCLP_U | DSTR → DSTR_U |
| DSTRP → DSTRP_U | DVAL → DVAL_U | DVALP → DVALP_U | DWSUM → DWSUM_U |
| DWSUMP → DWSUMP_U | DZONE → DZONE_U | DZONEP → DZONEP_U | GBIN → GBIN_U |
| GBINP → GBINP_U | GRY → GRY_U | GRYP → GRYP_U | INC → INC_U |
| INCP → INCP_U | LIMITP → LIMITP_U | MAXP → MAXP_U | MEAN → MEAN_U |
| MEANP → MEANP_U | MINP → MINP_U | SCL → SCL_U | SCL2 → SCL2_U |
| SCL2P → SCL2P_U | SCLP → SCLP_U | STR → STR_U | STRP → STRP_U |
| VAL → VAL_U | VALP → VALP_U | WSUM → WSUM_U | WSUMP → WSUMP_U |
| ZONE → ZONE_U | ZONEP → ZONEP_U | - | - |

■Standard functions/function blocks of which names and arguments need to be replaced

| Names that need to be replaced → names after replacement | | |
|--|--|--|
| BCD_TO_STR → BCD_TO_STRING | BCD_TO_STR_E → BCD_TO_STRING_E ^{*1} | BOOL_TO_STR → BOOL_TO_STRING |
| BOOL_TO_STR_E → BOOL_TO_STRING_E ^{*1} | DINT_TO_STR → DINT_TO_STRING | DINT_TO_STR_E → DINT_TO_STRING_E ^{*1} |
| DWORD_TO_STR → DWORD_TO_STRING | DWORD_TO_STR_E → DWORD_TO_STRING_E ^{*1} | INT_TO_STR → INT_TO_STRING |
| INT_TO_STR_E → INT_TO_STRING_E ^{*1} | LIMITATION → LIMIT | LIMITATION_E → LIMIT_E ^{*3} |
| MAXIMUM → MAX | MAXIMUM_E → MAX_E ^{*2} | MINIMUM → MIN |
| MINIMUM_E → MIN_E ^{*2} | REAL_TO_STR → REAL_TO_STRING | REAL_TO_STR_E → REAL_TO_STRING_E ^{*1} |
| STR_TO_BCD → STRING_TO_BCD | STR_TO_BCD_E → STRING_TO_BCD_E ^{*1} | STR_TO_BOOL → STRING_TO_BOOL |
| STR_TO_BOOL_E → STRING_TO_BOOL_E ^{*1} | STR_TO_DINT → STRING_TO_DINT | STR_TO_DINT_E → STRING_TO_DINT_E ^{*1} |
| STR_TO_DWORD → STRING_TO_DWORD | STR_TO_DWORD_E → STRING_TO_DWORD_E ^{*1} | STR_TO_INT → STRING_TO_INT |
| STR_TO_INT_E → STRING_TO_INT_E ^{*1} | STR_TO_REAL → STRING_TO_REAL | STR_TO_REAL_E → STRING_TO_REAL_E ^{*1} |
| STR_TO_TIME → STRING_TO_TIME | STR_TO_TIME_E → STRING_TO_TIME_E ^{*1} | STR_TO_WORD → STRING_TO_WORD |
| STR_TO_WORD_E → STRING_TO_WORD_E ^{*1} | TIME_TO_STR → TIME_TO_STRING | TIME_TO_STR_E → TIME_TO_STRING_E ^{*1} |
| WORD_TO_STR → WORD_TO_STRING | WORD_TO_STR_E → WORD_TO_STRING_E ^{*1} | - |

*1 The following replacement is required.

The second argument → the third argument, the third argument → the left side of the assignment statement, the left side of the assignment statement → the second argument

Example: M0 := BCD_TO_STR_E(SM400, I_word, I_string); → I_string := BCD_TO_STRING_E(SM400, M0, I_word);

*2 The following replacement is required.

The second argument → the third argument, the third argument → the fourth argument, the fourth argument → the left side of the assignment statement, the left side of the assignment statement → the second argument

Example: M0 := MAXIMUM_E(SM400, D1, D2, D3); → D3 := MAX_E(SM400, M0, D1, D2);

*3 The following replacement is required.

The second argument → the third argument, the third argument → the fourth argument, the fourth argument → the fifth argument, the fifth argument → the left side of the assignment statement, the left side of the assignment statement → the second argument

Example: M0 := LIMITATION_E(SM400, D1, D2, D3, D4); → D4 := LIMIT_E(SM400, M0, D1, D2, D3);

■Instructions in which the names and arguments need to be replaced

| Names that need to be replaced → names after replacement | | |
|--|---------------------------------------|---------------------------------------|
| ACOSD_E_MD → ACOSD | ACOSD_MD → ACOSD ^{*1} | AND_DT_EQ_M → ANDDT_EQ ^{*7} |
| AND_DT_GE_M → ANDDT_GE ^{*7} | AND_DT_GT_M → ANDDT_GT ^{*7} | AND_DT_LE_M → ANDDT_LE ^{*7} |
| AND_DT_LT_M → ANDDT_LT ^{*7} | AND_DT_NE_M → ANDDT_NE ^{*7} | AND_EDEQ_M → ANDED_EQ |
| AND_EDGE_M → ANDED_GE | AND_EDGT_M → ANDED_GT | AND_EDLE_M → ANDED_LE |
| AND_EDLT_M → ANDED_LT | AND_EDNE_M → ANDED_NE | AND_EEQ_M → ANDE_EQ |
| AND_EGE_M → ANDE_GE | AND_EGT_M → ANDE_GT | AND_ELE_M → ANDE_LE |
| AND_ELT_M → ANDE_LT | AND_ENE_M → ANDE_NE | AND_EQ_M → AND_EQ |
| AND_GE_M → AND_GE | AND_GT_M → AND_GT | AND_LE_M → AND_LE |
| AND_LT_M → AND_LT | AND_NE_M → AND_NE | AND_STRING_EQ_M → ANDSTRING_EQ |
| AND_STRING_GE_M → ANDSTRING_GE | AND_STRING_GT_M → ANDSTRING_GT | AND_STRING_LE_M → ANDSTRING_LE |
| AND_STRING_LT_M → ANDSTRING_LT | AND_STRING_NE_M → ANDSTRING_NE | AND_TM_EQ_M → ANDTM_EQ ^{*8} |
| AND_TM_GE_M → ANDTM_GE ^{*8} | AND_TM_GT_M → ANDTM_GT ^{*8} | AND_TM_LE_M → ANDTM_LE ^{*8} |
| AND_TM_LT_M → ANDTM_LT ^{*8} | AND_TM_NE_M → ANDTM_NE ^{*8} | ANDD_EQ_M → ANDD_EQ |
| ANDD_GE_M → ANDD_GE | ANDD_GT_M → ANDD_GT | ANDD_LE_M → ANDD_LE |
| ANDD_LT_M → ANDD_LT | ANDD_NE_M → ANDD_NE | ASIND_E_MD → ASIND |
| ASIND_MD → ASIND ^{*1} | ATAND_E_MD → ATAND | ATAND_MD → ATAND ^{*1} |
| BKCMP_EQ_M → BKCMP_EQ ^{*9} | BKCMP_EQP_M → BKCMP_EQP ^{*9} | BKCMP_GE_M → BKCMP_GE ^{*9} |
| BKCMP_GEP_M → BKCMP_GEP ^{*9} | BKCMP_GT_M → BKCMP_GT ^{*9} | BKCMP_GTP_M → BKCMP_GTP ^{*9} |
| BKCMP_LE_M → BKCMP_LE ^{*9} | BKCMP_LEP_M → BKCMP_LEP ^{*9} | BKCMP_LT_M → BKCMP_LT ^{*9} |
| BKCMP_LTP_M → BKCMP_LTP ^{*9} | BKCMP_NE_M → BKCMP_NE ^{*9} | BKCMP_NEP_M → BKCMP_NEP ^{*9} |
| BKMINUS_M → BKMINUS | BKMINUSP_M → BKMINUSP | BKPLUS_M → BKPLUS |
| BKPLUSP_M → BKPLUSP | BMINUS_3_M → BMINUS | BMINUSP_3_M → BMINUSP |
| BPLUS_3_M → BPLUS | BPLUSP_3_M → BPLUSP | BREAK_MD → BREAK ^{*6} |
| BREAK_P_MD → BREAKP ^{*6} | CALL_M → CALL_1 ^{*6} | CALLP_M → CALLP_1 ^{*6} |

| Names that need to be replaced → names after replacement | | |
|--|---|---|
| CHGT_D_M → D_CHGT ³ | CHGT_DP_M → DP_CHGT ³ | CJ_M → CJ ⁶ |
| CMP_M → CMP ⁹ | CMPP_M → CMPP ⁹ | COSD_E_MD → COSD |
| COSD_MD → COSD ¹ | DATEMINUS_M → DATEMINUS | DATEMINUS_S_M → S_DATEMINUS |
| DATEMINUS_SP_M → SP_DATEMINUS | DATEMINUSP_M → DATEMINUSP | DATEPLUS_M → DATEPLUS |
| DATEPLUS_S_M → S_DATEPLUS | DATEPLUS_SP_M → SP_DATEPLUS | DATEPLUSP_M → DATEPLUSP |
| DBKCMP_EQ_M → DBKCMP_EQ ¹¹ | DBKCMP_EQP_M → DBKCMP_EQP ¹¹ | DBKCMP_GE_M → DBKCMP_GE ¹¹ |
| DBKCMP_GEP_M → DBKCMP_GEP ¹¹ | DBKCMP_GT_M → DBKCMP_GT ¹¹ | DBKCMP_GTP_M → DBKCMP_GTP ¹¹ |
| DBKCMP_LE_M → DBKCMP_LE ¹¹ | DBKCMP_LEP_M → DBKCMP_LEP ¹¹ | DBKCMP_LT_M → DBKCMP_LT ¹¹ |
| DBKCMP_LTP_M → DBKCMP_LTP ¹¹ | DBKCMP_NE_M → DBKCMP_NE ¹¹ | DBKCMP_NEP_M → DBKCMP_NEP ¹¹ |
| DBKMINUS_M → DBKMINUS ¹² | DBKMINUSP_M → DBKMINUSP ¹² | DBKPLUS_M → DBKPLUS ¹² |
| DBKPLUSP_M → DBKPLUSP ¹² | DBMINUS_3_M → DBMINUS | DBMINUSP_3_M → DBMINUSP |
| DBPLUS_3_M → DBPLUS | DBPLUSP_3_M → DBPLUSP | DCMP_M → DCMP ¹¹ |
| DCMPP_M → DCMPP ¹¹ | DDIVID_3_M → DDIVISION | DDIVIDP_3_M → DDIVISIONP |
| DIV_MD → EDIVISION ⁵ | DIV_P_MD → EDIVISIONP ⁵ | DIVID_3_M → DIVISION |
| DIVIDP_3_M → DIVISIONP | DLIMIT_MD → DLIMIT | DMAX_M → DMAX ¹⁰ |
| DMIN_M → DMIN ¹⁰ | DMINUS_3_M → DMINUS | DMINUSP_3_M → DMINUSP |
| DMULTI_3_M → DMULTI | DMULTIP_3_M → DMULTIP | DPLUS_3_M → DPLUS |
| DPLUSP_3_M → DPLUSP | DROL_2_M → DROL | DROL_M → DROL |
| DROR_2_M → DROR | DROR_M → DROR | DZCP_M → DZCP ¹³ |
| DZCPP_M → DZCPP ¹³ | EDDIV_M → EDDIVISION | EDDIVP_M → EDDIVISIONP |
| EDIV_M → EDIVISION | EDIVP_M → EDIVISIONP | EDMINUS_3_M → EDMINUS_3 |
| EDMINUSP_3_M → EDMINUSP_3 | EDPLUS_3_M → EDPLUS_3 | EDPLUSP_3_M → EDPLUSP_3 |
| EMINUS_3_M → EMINUS_3 | EMINUSP_3_M → EMINUSP_3 | EPLUS_3_M → EPLUS_3 |
| EPLUSP_3_M → EPLUSP_3 | EXPD_MD → EXPD ¹ | IRET_M → IRET |
| JMP_M → JMP ⁶ | LD_DT_EQ_M → LDDT_EQ ⁷ | LD_DT_GE_M → LDDT_GE ⁷ |
| LD_DT_GT_M → LDDT_GT ⁷ | LD_DT_LE_M → LDDT_LE ⁷ | LD_DT_LT_M → LDDT_LT ⁷ |
| LD_DT_NE_M → LDDT_NE ⁷ | LD_EDEQ_M → LDED_EQ | LD_EDGE_M → LDED_GE |
| LD_EDGT_M → LDED_GT | LD_EDLE_M → LDED_LE | LD_EDLT_M → LDED_LT |
| LD_EDNE_M → LDED_NE | LD_EEQ_M → LDE_EQ | LD_EGE_M → LDE_GE |
| LD_EGT_M → LDE_GT | LD_ELE_M → LDE_LE | LD_ELT_M → LDE_LT |
| LD_ENE_M → LDE_NE | LD_EQ_M → LD_EQ | LD_GE_M → LD_GE |
| LD_GT_M → LD_GT | LD_LE_M → LD_LE | LD_LT_M → LD_LT |
| LD_NE_M → LD_NE | LD_STRING_EQ_M → LDSTRING_EQ | LD_STRING_GE_M → LDSTRING_GE |
| LD_STRING_GT_M → LDSTRING_GT | LD_STRING_LE_M → LDSTRING_LE | LD_STRING_LT_M → LDSTRING_LT |
| LD_STRING_NE_M → LDSTRING_NE | LD_TM_EQ_M → LDTM_EQ ⁸ | LD_TM_GE_M → LDTM_GE ⁸ |
| LD_TM_LE_M → LDTM_GT ⁸ | LD_TM_LE_M → LDTM_LE ⁸ | LD_TM_LT_M → LDTM_LT ⁸ |
| LD_TM_NE_M → LDTM_NE ⁸ | LDD_EQ_M → LDD_EQ | LDD_GE_M → LDD_GE |
| LDD_GT_M → LDD_GT | LDD_LE_M → LDD_LE | LDD_LT_M → LDD_LT |
| LDD_NE_M → LDD_NE | LOGD_MD → LOGD ¹ | MINUS_3_M → MINUS |
| MINUSP_3_M → MINUSP | MULTI_3_M → MULTI | MULTIP_3_M → MULTIP |
| NEXT_M → NEXT | OR_DT_EQ_M → ORDT_EQ ⁷ | OR_DT_GE_M → ORDT_GE ⁷ |
| OR_DT_GT_M → ORDT_GT ⁷ | OR_DT_LE_M → ORDT_LE ⁷ | OR_DT_LT_M → ORDT_LT ⁷ |
| OR_DT_NE_M → ORDT_NE ⁷ | OR_EDEQ_M → ORED_EQ | OR_EDGE_M → ORED_GE |
| OR_EDGT_M → ORED_GT | OR_EDLE_M → ORED_LE | OR_EDLT_M → ORED_LT |
| OR_EDNE_M → ORED_NE | OR_EEQ_M → ORE_EQ | OR_EGE_M → ORE_GE |
| OR_EGT_M → ORE_GT | OR_ELE_M → ORE_LE | OR_ELT_M → ORE_LT |
| OR_ENE_M → ORE_NE | OR_EQ_M → OR_EQ | OR_GE_M → OR_GE |
| OR_GT_M → OR_GT | OR_LE_M → OR_LE | OR_LT_M → OR_LT |
| OR_NE_M → OR_NE | OR_STRING_EQ_M → ORSTRING_EQ | OR_STRING_GE_M → ORSTRING_GE |
| OR_STRING_GT_M → ORSTRING_GT | OR_STRING_LE_M → ORSTRING_LE | OR_STRING_LT_M → ORSTRING_LT |
| OR_STRING_NE_M → ORSTRING_NE | OR_TM_EQ_M → ORTM_EQ ⁸ | OR_TM_GE_M → ORTM_GE ⁸ |
| OR_TM_GT_M → ORTM_GT ⁸ | OR_TM_LE_M → ORTM_LE ⁸ | OR_TM_LT_M → ORTM_LT ⁸ |
| OR_TM_NE_M → ORTM_NE ⁸ | ORD_EQ_M → ORD_EQ | ORD_GE_M → ORD_GE |

Names that need to be replaced → names after replacement

| | | |
|-----------------------------|------------------------------|--------------------------------|
| ORD_GT_M → ORD_GT | ORD_LE_M → ORD_LE | ORD_LT_M → ORD_LT |
| ORD_NE_M → ORD_NE | PLUS_3_M → PLUS | PLUSP_3_M → PLUSP |
| SCJ_M → SCJ* ⁶ | SIND_E_MD → SIND | SIND_MD → SIND* ¹ |
| SMOV_M → SMOV* ⁴ | SMOV_MD → MOV | SMOV_P_MD → MOV_P |
| SMOV_P_S_MD → STRINGMOV_P | SMOV_S_MD → STRINGMOV | STRING_MOV_M → STRINGMOV |
| STRING_MOVP_M → STRINGMOV_P | STRING_PLUS_3_M → STRINGPLUS | STRING_PLUSP_3_M → STRINGPLUSP |
| TAND_E_MD → TAND | TAND_MD → TAND* ¹ | ZCP_M → ZCP* ² |
| ZCPP_M → ZCPP* ² | - | - |

*1 The following replacement is required.

The types of second and third arguments → FLOAT (Double Precision) (ANYREAL_64) type

Example: `I_eno := EXPD_MD(I_en, I_word_array_1, I_word_array_2);` → `I_eno := EXPD(I_en, I_real_1, I_real_2);`

*2 The following replacement is required.

The types of second, third, and fourth arguments → the unsigned BIN 16 bit (ANY16_U) type

Example: `I_eno := ZCP_M(I_en, I_any16_1, I_any16_2, I_any16_3, I_bit_array);` → `I_eno := ZCP(I_en, I_word_1, I_word_2, I_word_3, I_bit_array);`

*3 The following replacement is required.

Add the signed BIN 16 bit (ANY16_S) type to the fifth argument. Then, the fifth argument → the sixth argument, the sixth argument → the seventh argument

Example: `I_eno := CHGT_D_M(I_en, I_int_1, I_string, I_int_2, I_bit_array, I_int);` → `I_eno := D_CHGT(I_en, I_int_1, I_string, I_int_2, I_int_3, I_bit_array, I_int);`

*4 The following replacement is required.

The types of third, fourth, and fifth arguments → the unsigned BIN 16 bit (ANY16_U) type

Example: `I_eno := SMOV_M(I_en, I_int_1, I_any16_1, I_any16_2, I_any16_3, I_int_2);` → `I_eno := SMOV(I_en, I_int_1, I_word_1, I_word_2, I_word_3, I_int_2);`

*5 The following replacement is required.

The types of second, third, and fourth arguments → FLOAT (Single Precision) (ANYREAL_32) type

Example: `I_eno := DIV_MD(I_en, I_any32_1, I_any32_2, I_any32_3);` → `I_eno := EDIVISION(I_en, I_real_1, I_real_2, I_real_3);`

*6 The following replacement is required.

The type of second argument → the device name (POINTER) type

Example: `I_eno := BREAK_MD(I_en, I_int_1, I_int_2);` → `I_eno := BREAK(I_en, I_pointer, I_int_2);`

*7 The following replacement is required.

The types of second and third arguments → the signed BIN 16 bit (ANY_DT) type

Example: `I_eno := LD_DT_EQ_M(I_en, I_any16_array_1, I_any16_array_2, I_int_3);` → `I_eno := LDDT_EQ(I_en, I_int_1, I_int_2, I_int_3);`

*8 The following replacement is required.

The types of second and third arguments → the signed BIN 16 bit (ANY_TM) type

Example: `I_eno := LD_TM_EQ_M(I_en, I_any16_array_1, I_any16_array_2, I_int_3);` → `I_eno := LDTM_EQ(I_en, I_int_1, I_int_2, I_int_3);`

*9 The following replacement is required.

The types of second and third arguments → the signed BIN 16 bit (ANY16_S) type

Example: `I_eno := CMP_M(I_en, I_word_1, I_word_2, I_bit_array);` → `I_eno := CMP(I_en, I_int_1, I_int_2, I_bit_array);`

*10 The following replacement is required.

The type of second argument → the signed BIN 32 bit (ANY32_S) type, the type of fourth argument → the signed BIN 32 bit (ANY32_S_ARRAY, number of elements: 4) type

Example: `I_eno := DMAX_M(I_en, I_any32_1, I_word, I_any32_2);` → `I_eno := DMAX(I_en, I_dint, I_word, I_dint_array);`

*11 The following replacement is required.

The types of second and third arguments → the signed BIN 32 bit (ANY32_S) type

Example: `I_eno := DBKCMP_EQ_M(I_en, I_any32_1, I_any32_2, I_word, I_bool);` → `I_eno := DBKCMP_EQ(I_en, I_dint_1, I_dint_2, I_word, I_bool);`

*12 The following replacement is required.

The types of second, third, and fifth arguments → the signed BIN 32 bit (ANY32_S) type, the type of fourth argument → the unsigned BIN 16 bit (ANY16) type

Example: `I_eno := DBKMINUS_M(I_en, I_any32_1, I_any32_2, I_any32_3, I_any32_4);` → `I_eno := DBKMINUS(I_en, I_dint_1, I_dint_2, I_word, I_dint_3);`

*13 The following replacement is required.

The types of second, third, and fourth arguments → the signed BIN 32 bit (ANY32_S) type

Example: `I_eno := DZCP_M(I_en, I_any32_1, I_any32_2, I_any32_3, I_bit_array);` → `I_eno := DZCP(I_en, I_dint_1, I_dint_2, I_dint_3, I_bit_array);`

■ Standard functions of which arguments need to be replaced

| Name | | | | | |
|--------------------------------|-------------------------------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|
| ABS_E ^{*1} | ACOS ^{*3} | ACOS_E ^{*1} | ADD_E ^{*2} | ADD_TIME_E ^{*2} | AND_E ^{*2} |
| ASIN ^{*3} | ASIN_E ^{*1} | ATAN ^{*3} | ATAN_E ^{*1} | BCD_TO_DINT_E ^{*1} | BCD_TO_INT_E ^{*1} |
| BITARR_TO_DINT_E ^{*2} | BITARR_TO_INT_E ^{*1} | BOOL_TO_DINT_E ^{*1} | BOOL_TO_DWORD_E ^{*1} | BOOL_TO_INT_E ^{*1} | BOOL_TO_TIME_E ^{*1} |
| BOOL_TO_WORD_E ^{*1} | CONCAT_E ^{*2} | COS ^{*3} | COS_E ^{*1} | CPY_BIT_OF_INT_E ^{*2} | CPY_BITARR_E ^{*2} |
| DELETE_E ^{*2} | DINT_TO_BCD_E ^{*1} | DINT_TO_BITARR_E ^{*2} | DINT_TO_BOOL_E ^{*1} | DINT_TO_DWORD_E ^{*1} | DINT_TO_INT_E ^{*1} |
| DINT_TO_LREAL ^{*1} | DINT_TO_LREAL_E ^{*1} | DINT_TO_REAL_E ^{*1} | DINT_TO_TIME_E ^{*1} | DINT_TO_WORD_E ^{*1} | DIV_E ^{*2} |
| DIV_TIME_E ^{*2} | DWORD_TO_BOOL_E ^{*1} | DWORD_TO_DINT_E ^{*1} | DWORD_TO_INT_E ^{*1} | DWORD_TO_TIME_E ^{*1} | DWORD_TO_WORD_E ^{*1} |
| EQ_E ^{*2} | EXP ^{*3} | EXP_E ^{*1} | EXPT_E ^{*2} | FIND_E ^{*2} | GE_E ^{*2} |
| GET_BIT_OF_INT_E ^{*2} | GT_E ^{*2} | INSERT_E ^{*4} | INT_TO_BCD_E ^{*1} | INT_TO_BITARR_E ^{*2} | INT_TO_BOOL_E ^{*1} |
| INT_TO_DINT_E ^{*1} | INT_TO_DWORD_E ^{*1} | INT_TO_LREAL_E ^{*1} | INT_TO_REAL_E ^{*1} | INT_TO_TIME_E ^{*1} | INT_TO_WORD_E ^{*1} |
| LE_E ^{*2} | LEFT ^{*6} | LEFT_E ^{*2} | LEN ^{*3} | LEN_E ^{*1} | LN_E ^{*1} |
| LREAL_TO_DINT_E ^{*1} | LREAL_TO_INT_E ^{*1} | LREAL_TO_REAL_E ^{*1} | LT_E ^{*2} | MID_E ^{*4} | MOD_E ^{*2} |
| MOVE_E ^{*1} | MUL_E ^{*1} | MUL_TIME_E ^{*1} | MUX_E ^{*1} | NE_E ^{*1} | NOT_E ^{*1} |
| OR_E ^{*1} | REAL_TO_DINT_E ^{*1} | REAL_TO_INT_E ^{*1} | REAL_TO_LREAL_E ^{*1} | REPLACE_E ^{*7} | RIGHT ^{*6} |
| RIGHT_E ^{*2} | ROL ^{*5} | ROL_E ^{*2} | ROR ^{*5} | ROR_E ^{*2} | SEL_E ^{*1} |
| SET_BIT_OF_INT_E ^{*2} | SHL_E ^{*1} | SHR_E ^{*1} | SIN ^{*3} | SIN_E ^{*1} | SQRT_E ^{*1} |
| SUB_E ^{*1} | SUB_TIME_E ^{*2} | TAN ^{*3} | TAN_E ^{*1} | TIME_TO_BOOL_E ^{*1} | TIME_TO_DINT_E ^{*1} |
| TIME_TO_DWORD_E ^{*1} | TIME_TO_INT_E ^{*1} | TIME_TO_WORD_E ^{*1} | WORD_TO_BOOL_E ^{*1} | WORD_TO_DINT_E ^{*1} | WORD_TO_DWORD_E ^{*1} |
| WORD_TO_INT_E ^{*1} | WORD_TO_TIME_E ^{*1} | XOR_E ^{*2} | - | - | - |

*1 The following replacement is required.

The second argument → the third argument, the third argument → the left side of the assignment statement, the left side of the assignment statement → the second argument

Example: M0 := ABS_E(SM400, I_num_in, I_num_d); → I_num_d := ABS_E(SM400, M0, I_num_in);

*2 The following replacement is required.

The second argument → the third argument, the third argument → the fourth argument, the fourth argument → the left side of the assignment statement, the left side of the assignment statement → the second argument

Example: M0 := ADD_E(SM400, I_num1, I_num2, I_num_d); → I_num_d := ADD_E(SM400, M0, I_num1, I_num2);

*3 The following replacement is required.

The third argument → the left side of the assignment statement. Delete the first argument.

Example: ACOS(SM400, I_real_s, I_real_d); → I_real_d := ACOS(I_real_s);

*4 The following replacement is required.

The second argument → the third argument, the third argument → the fourth argument, the fourth argument → the fifth argument, the fifth argument → the left side of the assignment statement, the left side of the assignment statement → the second argument

Example: M0 := INSERT_E(SM400, I_string1, I_string2, I_num_in, I_string_d); → I_string_d := INSERT_E(SM400, M0, I_string1, I_string2, I_num_in);

*5 The following replacement is required.

Delete the first argument. The third argument → the left side of the assignment statement. Add the input value (WORD type) to the second argument.

Example: ROL(SM400, I_any16_in, I_any16_d); → I_any16_d := ROL(I_any16_in, I_any16_n);

*6 The following replacement is required.

The fourth argument → the left side of the assignment statement. Delete the first argument.

Example: LEFT(SM400, I_string1, I_num_in, I_string_d); → I_string_d := LEFT(I_string1, I_num_in);

*7 The following replacement is required.

The second argument → the third argument, the third argument → the fourth argument, the fourth argument → the fifth argument, the fifth argument → the sixth argument, the sixth argument → the left side of the assignment statement, the left side of the assignment statement → the second argument

Example: M0 := REPLACE_E(SM400, I_string1, I_string2, I_num1, I_num2, I_string_d); → I_string_d := REPLACE_E(SM400, M0, I_string1, I_string2, I_num1, I_num2);

■Standard function blocks of which arguments need to be replaced

| Name | | | | | |
|----------------------|---------------------------|----------------------|---------------------------|-----------------------|-------------------------|
| CTD ^{*1} | CTD_E ^{*1} | CTU ^{*2} | CTU_E ^{*2} | CTUD ^{*1,*2} | CTUD_E ^{*1,*2} |
| F_TRIG ^{*3} | F_TRIG_E ^{*3,*4} | R_TRIG ^{*3} | R_TRIG_E ^{*3,*4} | RS ^{*7} | RS_E ^{*7,*4} |
| SR ^{*2} | SR_E ^{*7,*5} | TOF_E ^{*5} | TON_E ^{*6} | TP_E ^{*6} | - |

*1 The following replacement is required.

LOAD → LD

Example: CTD_1(CD := I_bool, LOAD := I_bool, PV := I_int, Q := I_bool_d, CV := I_int_d); → CTD_1(CD := I_bool, LD := I_bool, PV := I_int, Q := I_bool_d, CV := I_int_d);

*2 The following replacement is required.

RESET → R

Example: CTU_1(CU := I_bool, RESET := I_bool, PV := I_int, Q := I_bool_d, CV := I_int_d); → CTU_1(CU := I_bool, R := I_bool, PV := I_int, Q := I_bool_d, CV := I_int_d);

*3 The following replacement is required.

_CLK → CLK

Example: R_TRIG_1(_CLK := I_bool, Q := I_bool_d); → R_TRIG_1(CLK := I_bool, Q := I_bool_d);

*4 The following replacement is required.

The fourth argument → the second argument, the second argument → the third argument, the third argument → the fourth argument

Example: R_TRIG_E_1(EN := SM400, _CLK := I_bool, Q := I_bool_d, ENO := M0); → R_TRIG_E_1(EN := SM400, ENO := M0, CLK := I_bool, Q := I_bool_d);

*5 The following replacement is required.

The fifth argument → the second argument, the second argument → the third argument, the third argument → the fourth argument, the fourth argument → the fifth argument

Example: inst_TOF_E(EN := I_bool1, IN := I_bool2, PT := I_time, Q := I_bool3, ET := I_time2, ENO := I_bool4); → inst_TOF_E(EN := I_bool1, ENO := I_bool4, IN := I_bool2, PT := I_time1, Q := I_bool3, ET := I_time2);

*6 The following replacement is required.

The sixth argument → the second argument, the second argument → the third argument, the third argument → the fourth argument, the fourth argument → the fifth argument, the fifth argument → the sixth argument

Example: inst_TON_E(EN := I_bool1, IN := I_bool2, PT := I_time1, Q := I_bool3, ET := I_time2, ENO := I_bool4); → inst_TON_E(EN := I_bool1, ENO := I_bool4, IN := I_bool2, PT := I_time1, Q := I_bool3, ET := I_time2);

*7 The following replacement is required.

_S → S, _R → R

Example: RS_1(_S := I_bool, _R1 := I_bool, Q1 := I_bool_d); → RS_1(S := I_bool, R1 := I_bool, Q1 := I_bool_d);

■LIMIT instruction

| Names that need to be replaced → names after replacement | |
|--|------------------------------|
| LIMIT ^{*1} | DLIMIT → LIMIT ^{*2} |

*1 The following replacement is required.

Delete the first argument. The second argument → the first argument, the third argument → the second argument, the fourth argument → the third argument, the fifth argument → the left side of the assignment statement

Example: LIMIT(SM400, D1, D2, D3, D4); → D4 := LIMIT(D1, D2, D3);

*2 The following replacement is required.

Delete the first argument. The second argument → the first argument:D, the third argument → the second argument:D, the fourth argument → the third argument:D, the fifth argument → the left side of the assignment statement:D ('D' indicates a suffix.)

Example: DLIMIT(SM400, D0, D2, D4, D6); → D6:D := LIMIT(D0:D, D2:D, D4:D);

Replacement of instructions (GX Works3 Version 1.040S or later)

The following table shows the instructions in which the data types of arguments differ between a GX Works2 format project and a GX Works3 format project.

When a label is specified to an argument, it can be used in GX Works3 without replacing its data type by selecting "No" or "Do Not Check Only BMOV(P)/FMOV(P)" in the following option.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the data type of instruction argument"

| Name | | | | | |
|------------|------------|------------|-------------|-----------|-----------|
| BDSQR | BDSQRP | BMOV | BMOV_P | BMOV_E | BSQR |
| BSQRP | D_DDRD | DP_DDRD | D_DDWR | DP_DDWR | DB* |
| DB*P | DHOURM | DSORT | DVAL | DVALP | DWSUM |
| DWSUMP | FMOV | FMOV_P | G_BIDIN | GP_BIDIN | G_BIDOUT |
| GP_BIDOUT | G_CCASET | GP_CCASET | G_CCREQ | GP_CCREQ | G_CPRTCL |
| GP_CPRTCL | G_GETE | GP_GETE | G_INPUT | G_OGLOAD | GP_OGLOAD |
| G_OGSTOR | GP_OGSTOR | G_ONDEMAND | GP_ONDEMAND | G_OUTPUT | GP_OUTPUT |
| G_PRR | GP_PRR | G_PUT | GP_PUT | G_RDMSG | GP_RDMSG |
| G_READ | GP_READ | G_REQ | GP_REQ | G_RIRCV | GP_RIRCV |
| G_RIRD | GP_RIRD | G_RISEND | GP_RISEND | G_RIWT | GP_RIWT |
| G_RLPASET | GP_RLPASET | G_SPBUSY | GP_SPBUSY | G_WRITE | GP_WRITE |
| GP_ECPRTCL | J_CCREQ | JP_CCREQ | J_REQ | JP_REQ | J_RIRD |
| JP_RIRD | J_RIWT | JP_RIWT | J_ZNRD | JP_ZNRD | J_ZNWR |
| JP_ZNWR | S_2PID | S_ABS | S_ADD | S_AMR | S_AT1 |
| S_AVE | S_BC | S_BPI | S_BUMP | S_D | S_DBND |
| S_DED | S_DIV | S_DUTY | S_ENG | S_EQ | S_FG |
| S_FLT | S_GE | S_GT | S_HS | S_I | S_IENG |
| S_IFG | S_IN | S_IPD | S_LE | S_LIMT | S_LLAG |
| S_LS | S_LT | S_MID | S_MOUT | S_MUL | S_ONF2 |
| S_ONF3 | S_OUT1 | S_OUT2 | S_PGS | S_PHPL | S_PID |
| S_PIDP | S_PSUM | S_R | S_SEL | S_SPI | S_SQR |
| S_SUB | S_SUM | S_TPC | S_VLMT1 | S_VLMT2 | SECOND |
| SECONDP | SORT | SP_ECPRTCL | STR | STRP | VAL |
| VALP | Z_ABRST1 | Z_ABRST2 | Z_ABRST3 | Z_ABRST4 | Z_MBREQ |
| ZP_MBREQ | Z_MBRW | ZP_MBRW | Z_RECVS | Z_UINI | ZP_UINI |
| ZP_BUFRCV | ZP_BUFSND | ZP_CLOSE | ZP_CSET | ZP_ERRRD | ZP_OPEN |
| ZP_PFWRT | ZP_PINIT | ZP_PSTRT1 | ZP_PSTRT2 | ZP_PSTRT3 | ZP_PSTRT4 |
| ZP_TEACH1 | ZP_TEACH2 | ZP_TEACH3 | ZP_TEACH4 | - | - |

A

Precautions

If "No" or "Do Not Check Only BMOV(P)/FMOV(P)" is selected for the following option when the data type of an argument of an instruction is changed, it is not checked whether the data type is appropriate for the instruction.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Check the data type of instruction argument"

In this case, the area in the memory which is actually used may not match the one which is used for the label specified as an argument.

Refer to the following manual and check that the data type of the label is appropriate.

📖 MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

📖 MELSEC iQ-R Programming Manual (Module Dedicated Instructions)

Correcting devices

■Devices that are not supported by MELSEC iQ-R series or MELSEC iQ-L series modules

- When a device which is not supported by MELSEC iQ-R series or MELSEC iQ-L series modules is included in a program of a GX Works2 format project, it is replaced with SM4095/SD4095. In addition, if the program is a ladder program, the device used as an argument of an instruction may be replaced with a character string (SM4095 or SD4095). To search for this character string, refer to the following:

 Page 466 Searching for/Replacing Character Strings

- Step relays (S) and file registers (R) will be deleted when they are set as the device memory data or the initial device value data in a GX Works2 format project.

■Number of device points and start/end device

An available range for the number of device points may differ depending on the module series.

If a value, which cannot be set for MELSEC iQ-R series or MELSEC iQ-L series modules, has been set in parameters of a GX Works2 format project, it is corrected when the project is opened in GX Works3.

■Increase in the number of device points due to differences in local device setting units

The number of device points assigned to each local device differs depending on the module series. When the module type is changed, CPU parameters are automatically modified, which results in increase in the number of device points.

The following table shows the setting units for each series.

| Series | Setting units |
|-------------|---|
| MELSEC-Q | Bit device: 1-point units Word device: 1-point units |
| MELSEC-L | |
| MELSEC iQ-R | Bit device: 64-point units Word device (D): 4-point units |
| MELSEC iQ-L | Word device (T/ST/C): 32-point units Word device (LT/LST): 1-point units |

■Device name and label name display

- For a device that was set as a local device in GX Works2, prefix the device name with '#.'
- When a label used in GX Works2 has a name starting with "M+" or "P+," the "+" of the label name is replaced with "_".

■Step relays (S) and SFC block devices (BL)

Step relays (S) and SFC block devices (BL) may not be available in an ST editor and FBD/LD editor.

Correct the program to provide the equivalent operation to the ST program and Structured Ladder/FBD program of GX Works2.

For details, refer to the following:

 MELSEC iQ-R Programming Manual (Program Design)

■Correcting devices in address representation

Correct each device in address representation by replacing the character string.

GX Works3 does not support address representation of devices (such as "%MW0.0").


When address representation is used in a project created in GX Works2, it is read as is.


Correcting programs

■ Structured Ladder/FBD program

- The execution order is handled differently between Structured Ladder/Function Block Diagram language in GX Works2 and Function Block Diagram/Ladder Diagram language in GX Works3. Display the execution order and check it.
- A way of counting FBD network blocks differ between a program written in Structured Ladder/Function Block Diagram language in GX Works2 and a program written in Function Block Diagram/Ladder Diagram language in GX Works3. For a program written in Structured Ladder/Function Block Diagram language in GX Works2, a single function block is counted as a single FBD network block. For a program written in Function Block Diagram/Ladder Diagram language in GX Works3, all connected elements are counted as a single FBD network block. Therefore, a GX Works2 program may exceed the maximum number of creatable FBD network blocks (4096) when it is opened in GX Works3. In this case, divide the program and reduce the number of FBD network blocks.
- A performance of an return element differ between a program written in Structured Ladder/Function Block Diagram language in GX Works2 and a program written in Function Block Diagram/Ladder Diagram language in GX Works3. For details on return elements in GX Works3, refer to the following:

( Page 334 Common element)

- The number and the order of input/output arguments in some function elements and function block elements differ between a program written in Structured Ladder/Function Block Diagram language in GX Works2 and a program written in Function Block Diagram/Ladder Diagram language in GX Works3. Those elements are displayed as undefined FUNs and FBs. Select [Edit] ⇒ [Update FB/FUN] to update the definition information, and correct the program.
- When a program in which members of standard FB are referenced is created in Structured Ladder/Function Block Diagram of GX Works2, a conversion error may occur after opening the program with GX Works3. In this case, check the member name and class of the standard FB, and correct the program.
- Inverting the contact is available for input/output arguments of function elements/function block elements in Function Block Diagram/Ladder Diagram language of GX Works3. ( Page 337 Switching methods for contacts/instructions)
Connection lines of those elements are deleted when the elements other than above are inverted in a Structured Ladder/FBD program of GX Works2. Correct the program to provide equivalent operations to the Structured Ladder/FBD program in GX Works2.
- Function Block Diagram/Ladder Diagram language in GX Works3 does not support wired OR of FBD elements. Correct the program to provide the equivalent operation to the Structured Ladder/FBD program of GX Works2 since a conversion error is caused.
- When a pointer branch instruction (CJ, SCJ, JMP), a jump, or a subroutine program is used, a conversion error may occur.*1
- The program layout may be changed due to the differences between a Structured Ladder/FBD editor of GX Works2 and an FBD/LD editor of GX Works3. In that case, correct the layout properly.
Additionally, the layout can be corrected by the layout correction function. For details on the layout correction function, refer to the following:

( Page 346 Layout correction)

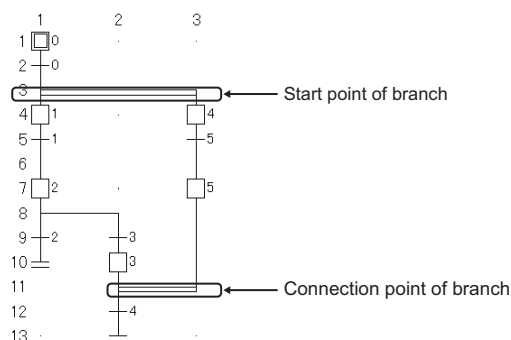
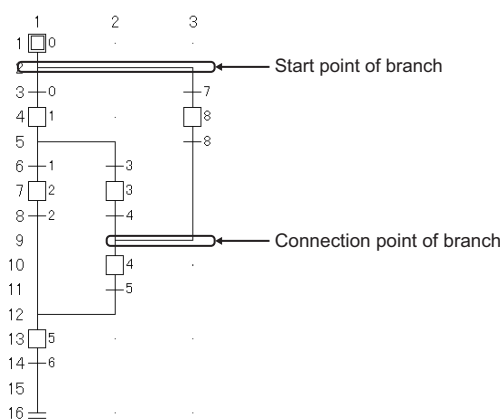
- Ladder block label used in the Structured Ladder/FBD of GX Works2 is defined as the pointer type in a local label.

*1 For details, refer to the following:

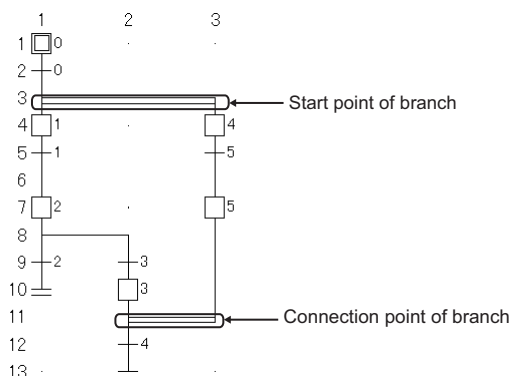
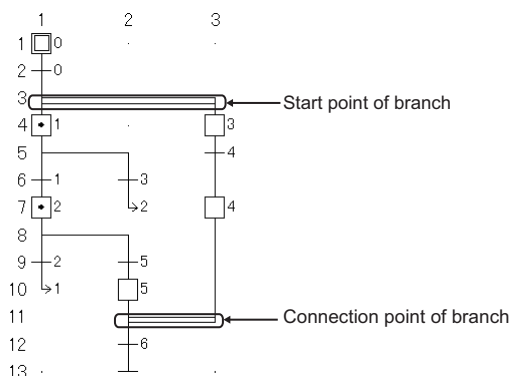
 MELSEC iQ-R Programming Manual (Program Design)

■SFC program

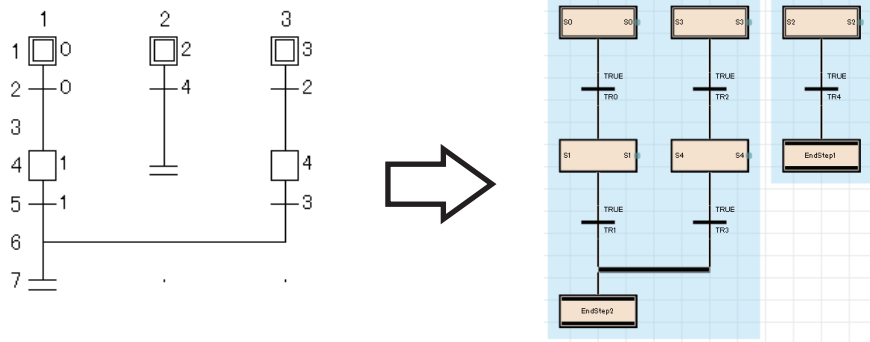
- Program restoration information included in an SFC program in GX Works3 is replaced with the source information in GX Works2. Note the data size of the program because it increases after replacement. The size can be checked in the "Size (Byte)" column on the [Write] tab on the "Online Data Operation" screen.
- A POU which is not included in the program setting of a structured project in GX Works2 cannot be read. Move the POU to the program setting before reading.
- When a label name such as "Step0" is included on an SFC diagram in GX Works2, the label name may duplicate with a step name and a label name in an SFC block after reading the SFC program. Change the step name/label name to avoid duplication.
- When an SFC program in the MELSAP-L (start condition format) format is read, it is converted into a program equivalent to one in MELSAP3 format.
- The settings to show an output only and not show a contact in a Zoom, cannot be set in GX Works3. Therefore, 'LD SM400' is added to a ladder block in which there is no contact when the ladder block is displayed in MELSAP3 format.
- A program is read in the detailed expression when some display formats (MELSAP3 and MELSAP-L) are used to display an SFC program in GX Works2.
- An SFC program such as shown below cannot be read with version 1.019V or earlier. It is because the connection point is not connected to the same line on which the starting point is connected on the branch. Adjust the positions for the starting point and the connection point of the branch so that they are connected to the same line before reading the program.



- An SFC program, such as shown below, cannot be read. It is because the connection point is not connected to the same line on which the starting point is connected on the branch. Switch the position of the jump or end step, and adjust the positions for the starting point and the connection point of the branch so that they are connected to the same line before reading the program.



- When an independent SFC diagram exists between the SFC diagrams in which multiple initial steps are connected each other as shown below, the program is read by moving the independent program to the rightmost.



Replacement of a PX Developer format project

Some units of PX Developer format project data are not supported by GX Works3.

A project needs to be corrected according to a GX Works3 format project after opening it.







Check the contents in this section, then correct a PX Developer project and a GX Works2 project.

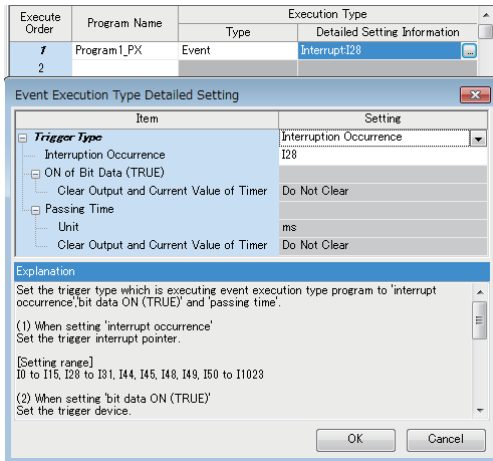
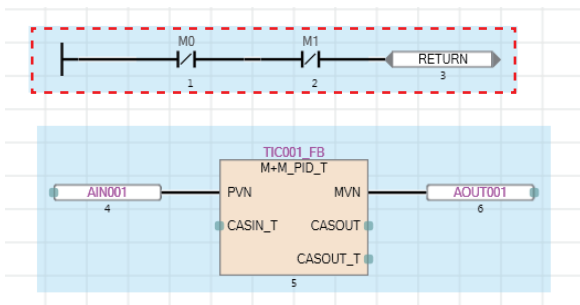
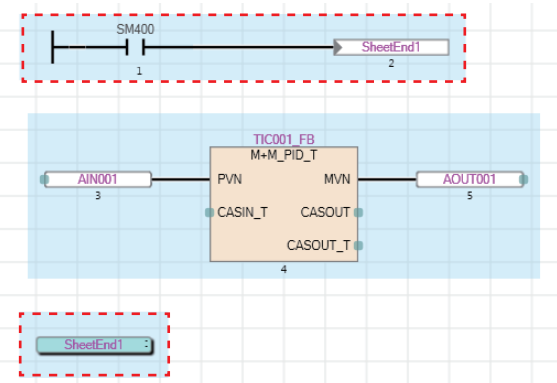
For details on the conversion processing for each data, refer to the following:

 Page 113 Opening a PX Developer format project

Correction of a PX Developer format project

■Setting items

| Setting item in PX Developer | | Operation in opening | Correction method | | | | | | | | | | | | |
|---------------------------------|--------------------|--|--|--|------------|--|--------|---|---------|-----|---------|---|--|-----|--|
| Module FB declaration | | Deleting the data | In an FBD/LD editor of GX Works3, create a program equivalent to a module FB in a PX Developer project by using an input (X), output (Y), or a module access device (U□\G). Delete a module FB (that is used in a PX Developer project) read to an FBD/LD program in GX Works3. | | | | | | | | | | | | |
| Initial value of an FB property | Tag FB declaration | Returning to the default if the initial values of FB properties were not read. | Set the initial value of an FB property of a tag FB which has been set for a PX Developer project as that of the initial value of an FB property of a tag FB in a GX Works3 format project. ( Page 387 Display/setting an FB property) | | | | | | | | | | | | |
| | FB | | Set the initial value of an FB property of an FB which has been set for a PX Developer project as that of the initial value of an FB property of an FB in a GX Works3 format project. ( Page 387 Display/setting an FB property) | | | | | | | | | | | | |
| GX Works2 label assignment | | Converting the data ^{*1} | <p>After opening a project, correct the global label "GXW2LabelAssignment_PX" as mentioned below to use a label name used in a PX Developer project in a GX Works3 format project.</p> <p>After the correction, delete the global label.</p> <table border="1"> <thead> <tr> <th></th><th>Label Name</th><th></th><th>Remark</th></tr> </thead> <tbody> <tr> <td>1</td><td>myVar01</td><td>...</td><td>myVar02</td></tr> <tr> <td>2</td><td></td><td>...</td><td></td></tr> </tbody> </table> <p> ❶ After opening a project, search for a character string in the "Label Name" column (label name used in a GX Works2 project) of "GXW2LabelAssignment_PX" in a GX Works3 format project. ( Page 460 SEARCHING FOR DATA) ❷ After checking that replacement is available, then replace the character string in the "Label Name" column with a character string (label name used in a PX Developer project) in the "Remark" column^{*2}. ❸ Delete the replaced label setting from "GXW2LabelAssignment_PX." When same names are shown in the "Label Name" column and the "Remark" column, delete the label setting from GXW2LabelAssignment_PX." (The procedure ❶ and ❷ is not required.) </p> <p>Point </p> <p>A label name can easily be replaced by using the automatic synchronization function. ( Page 241 Automatic synchronization)</p> <p>❶ Select "Yes" in the following option.</p> <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Other Editor" ⇒ "Label Editor Common" ⇒ "Track label name automatically in program editor" <p>❷ Convert all the programs. ( Page 432 Converting any or all programs)</p> <p>A conversion error may occur; however, go on to step ❸.</p> <p>❸ Open the global label "GXW2LabelAssignment_PX" in a label editor.</p> <p>❹ Copy a cell of the "Remarks" column^{*2}, and paste it to the "Label Name" column. The label name in the program is replaced.</p> <p>❺ Check that the label name is replaced, delete the global label "GXW2LabelAssignment_PX."</p> | | Label Name | | Remark | 1 | myVar01 | ... | myVar02 | 2 | | ... | |
| | Label Name | | Remark | | | | | | | | | | | | |
| 1 | myVar01 | ... | myVar02 | | | | | | | | | | | | |
| 2 | | ... | | | | | | | | | | | | | |

| Setting item in PX Developer | Operation in opening | Correction method |
|--|---------------------------------|--|
| Interrupt pointer execution | Changing to "No Execution Type" | <p>Set the following for the target program.</p> <p>❶ Select "CPU Parameter" ⇒ "Program Setting," then set a program name of a program to execute the interrupt pointer in the "Program Name" column.</p> <p>Select "Event" in the "Type" column of "Execution Type."</p> <p>❷ Click the [...] button in the "Detailed Setting Information" column, and select "Interruption Occurrence" for "Trigger Type" on the "Event Execution Type Detailed Setting" screen.</p> <p>Set an interrupt pointer for "Interruption Occurrence."</p>  |
| Execution condition settings of a program and an FBD sheet | Converting as a comment element | <p>Create a program to control the execution by combining a contact with jump/return on an FBD/LD editor in GX Works3 according to the execution condition settings of a program and an FBD sheet which have been set for a PX Developer project.</p> <p>The following shows the examples of processing to control the execution of a program.</p> <p>Example 1) Execute a program when 'M0' or 'M1' is true. (It is not executed when 'M0' and 'M1' are false.)</p>  <p>Example 2) Not execute a program of a worksheet always</p>  |
| I/O simulation setting | Deleting the data | <p>Register the contents of the I/O simulation setting which is set for a PX Developer project to the I/O system setting of the simulation function in GX Works3.</p> <p>For details on the I/O system setting, refer to the following:</p> <p>☞ Page 567 Simulation of External Device Operations</p> |

- *1 Converted as a global label "GXW2LabelAssignment_PX" of GX Works3.
 Each data is converted as follows: (☞ Page 235 Configuration of a label editor)
 Global label of GX Works2: "Label Name" column
 Global variable name in PX Developer: "Remark" column
 Comment: "Comment" column
- *2 The "Remarks" column is displayed by clicking the [Detail Display] button in a label editor.

■Program layout

The program layout may be changed due to the differences between an FBD editor of PX Developer and an FBD/LD editor of GX Works3. In that case, correct the layout properly.

Additionally, the layout can be corrected by the layout correction function. For details on the layout correction function, refer to the following:

☞ Page 346 Layout correction

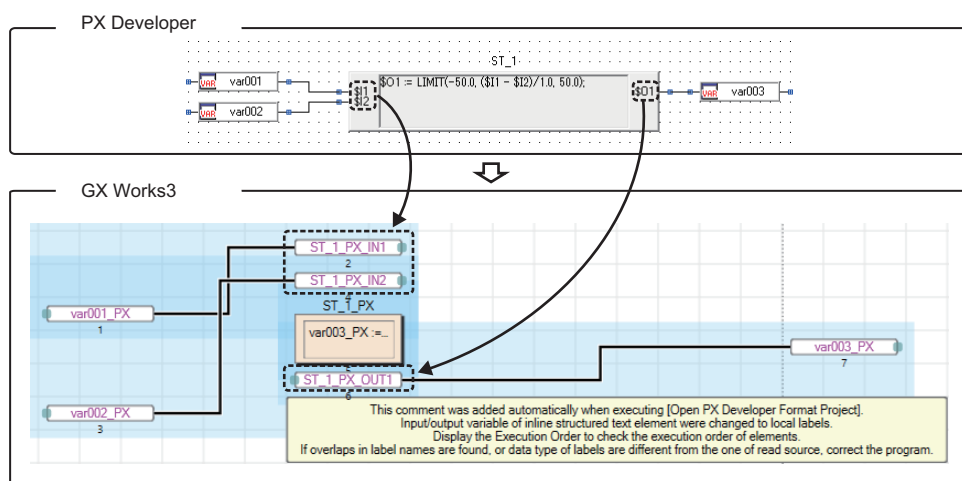
■Inline ST part

When opening a PX Developer format project created in PX Developer Version 1.55H or later in GX Works3 Version 1.080J or later, input/output variables of an inline ST part in the PX Developer format project are converted into local labels.

Check if a label name is duplicated or a data type of the PX Developer format project is different from the one before the project is opened in GX Works3.

In addition, the execution order of the program may be different between before and after opening the PX Developer format project because the input/output variables are replaced with local labels. Check the execution order.

Ex.



Correction of a GX Works2 project

Some settings for a GX Works2 project that are used in a PX Developer format project are not applied to a GX Works3 format project.

The following shows the settings that are not applied to a GX Works3 format project.

■Execution order of programs

The execution order of programs is changed as follow.

- Programs in a GX Works2 project → Programs in a PX Developer project

Correct the execution order in "Program Setting" of "CPU Parameter" in a GX Works3 format project as necessary.

■Others

For details on the replacement of other data, refer to the following:

☞ Page 940 Replacement of a GX Works2 format project

Automatic replacement of instructions

When using GX Works3 and PX Developer with either of the following version combinations, elements used in a PX Developer format project are automatically replaced with ones available in GX Works3 (for compatibility use).

- GX Works3: Version 1.055H or later, PX Developer: Version 1.52E or later
- GX Works3: Version 1.080J or later, PX Developer: Version 1.55H or later

This section explains the replacement of elements being used in a PX Developer project.

For details on the replacement of elements being used in a GX Works2 format project, refer to the following:

 Page 941 Automatic replacement of elements (GX Works3 Version 1.047Z or later)

■Elements to be replaced automatically (for compatibility use)

The following table shows the elements that are automatically replaced.

- GX Works3: Version 1.055H or later, PX Developer: Version 1.52E or later

The elements to which "_PX" is added to their names are the replacements for elements of a PX Developer project.

Therefore, the instruction specifications are not described in the manual for each CPU module.

To create a program in GX Works3, use an element with the name before the replacement, and check the instruction specifications in the manual for each CPU module.

| Name before replacement → Name after replacement | | |
|--|----------------------------|------------------------------|
| EDGE_CHECK → EDGE_CHECK_PX | LATCH_BOOL → LATCH_BOOL_PX | LATCH_DWORD → LATCH_DWORD_PX |
| LATCH_REAL → LATCH_REAL_PX | LATCH_WORD → LATCH_WORD_PX | TOF_HIGH → TOF_HIGH_PX |
| TOF_LOW → TOF_LOW_PX | TON_HIGH → TON_HIGH_PX | TON_LOW → TON_LOW_PX |
| TP_HIGH → TP_HIGH_PX | TP_LOW → TP_LOW_PX | — |

- GX Works3: Version 1.080J or later, PX Developer: Version 1.55H or later

| Name before replacement → Name after replacement | | |
|--|---------------------------|---------------------------|
| CTD → M+CTD | CTU → M+CTU | CTUD → M+CTUD |
| EDGE_CHECK → M+EDGE_CHECK | F_TRIG → M+F_TRIG | LATCH_BOOL → M+LATCH_BOOL |
| LATCH_DWORD → M+LATCH_DWORD | LATCH_REAL → M+LATCH_REAL | LATCH_WORD → M+LATCH_WORD |
| R_TRIG → M+R_TRIG | RS → M+RS | SR → M+SR |
| TOF_HIGH → M+TOF_HIGH | TOF_LOW → M+TOF_LOW | TON_HIGH → M+TON_HIGH |
| TON_LOW → M+TON_LOW | TP_HIGH → M+TP_HIGH | TP_LOW → M+TP_LOW |

A



When using GX Works3 and PX Developer with either of the following version combinations, elements are replaced with ones that are not supported by that version of GX Works3; therefore, an error occurs when converting a project.

Upgrade GX Works3 and PX Developer to their latest versions.

- GX Works3: Version 1.054G or earlier, PX Developer: Version 1.52E or later
- GX Works3: Version 1.077F or earlier, PX Developer: Version 1.55H or later

Considerations

The following shows the considerations when opening a PX Developer format project in GX Works3.

■Tag names that cannot be set in GX Works3

Some tag names set in a PX Developer format project may include characters that cannot be used for label names in GX Works3. (Page 927 Unusable character strings for a label name)

In that case, the tag FB settings are not applied to GX Works3, and the initial FB property values are changed to their default.

To apply the initial FB property values, change the tag names in a PX Developer project in advance.

Examples of tag names that cannot be set in GX Works3 and their correction method are as follows.

Unavailable tag name

■Tag names before opening a project.

"Tag FB declaration" window in a PX Developer project

| No. | Tag FB Variable Name | Tag FB Type | Tag Type | Assigned Device |
|-----|----------------------|-------------|----------|-----------------|
| 1 | TIC001 | M_PID | PID | ZR3000 |
| (A) | LC001 | M_PID | PID | ZR3130 |
| (B) | SINGLE | M_PID | PID | ZR3260 |

(A) LC001: A reserved word (device) for GX Works3 and number are used together.

(B) SINGLE: A reserved word (IEC reserved word) for GX Works3 is used.

■When opening a project, the status will be changed as follows because tag names that cannot be used in GX Works3 have been used.

The following two warning messages appear in the "Output" window.

| No. | Result | Data Name | Category | Content |
|-----|---------|-----------|----------------|--|
| 15 | Warning | - | Tag FB Setting | An unseetable character or an unsupported tag FB by GX Works3 has been used in tag name. |
| 16 | Warning | - | FB Property | Default value was set as the initial value for FB property because Tag FB Setting has not been |

• Category: Tag FB Setting

Content: An unseetable character or an unsupported tag FB by GX Works3 has been used in tag name. Please check it through Tag FB Setting.

• Category: FB Property

Content: Default value was set as the initial value for FB property because Tag FB Setting has not been applied or the setting that does not reflect the initial value of FB property has been selected.

When [Apply] button is clicked in the tag FB setting editor, an error occurs.

| No. | Tag Name | Tag FB Type | Tag Type | Structured Data Type | FB Instance Name |
|-----|----------|-------------|----------|----------------------|------------------|
| 1 | TIC001 | M+M_PID | PID | M+TM_PID | TIC001_FB |
| 2 | LC001 | M+M_PID | PID | M+TM_PID | LC001_FB |
| 3 | SINGLE | M+M_PID | PID | M+TM_PID | SINGLE_FB |

The initial values of FB properties are changed to their default.

Correction method

■Correct the tag names as follows.

Correct the tag names that cannot be set in GX Works3 in the "Tag FB declaration" windows of a PX Developer project.

In a program where the tag FB is used, correct the variable names of the tag FB. *1

A correction example of tag names is as follows.

"Tag FB declaration" window in a PX Developer project

| No. | Tag FB Variable Name | Tag FB Type | Tag Type | Assigned Device |
|-----|----------------------|-------------|----------|-----------------|
| 1 | TIC001 | M_PID | PID | ZR3000 |
| (A) | LC_001 | M_PID | PID | ZR3130 |
| (B) | SINGLE_1 | M_PID | PID | ZR3260 |

(A) LC_001: Add any text between the reserved word (device) for GX Works3 and the number.

(B) SINGLE_01: Add any text to the reserved word (IEC reserved word) for GX Works3.

■When opening a project, the tag FB settings are applied and the initial FB property values are utilized.

*1 The variable name of a tag FB used in a program can be changed by editing the assignment information on a local variable sheet. For details, refer to the following:

📖PX Developer Version 1 Operating Manual (Programming Tool)

■Tag names to which an underscore is added

When opening a PX Developer format project, some tag names which cannot be set in GX Works3 are suffixed with an "_" (underscore).

To monitor or control data using these changed tag names in PX Developer Monitor Tool, change the settings of the tag names in PX Developer Monitor Tool.

By selecting "Yes" for the following option in GX Works3 before exporting an assignment information database file, however, changing the settings of the tag names in PX Developer is not necessary.

- [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Process Control Extension Setting" ⇒ "Tag FB" ⇒ "PX Developer Monitor Tool Interaction" ⇒ "Remove Underscore at the End of Tag Name"

This option is automatically set to "Yes" if there is a tag name that is suffixed with an "_" (underscore) when opening a PX Developer format project.

■Data name duplication


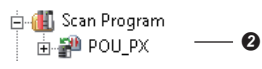
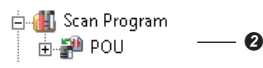
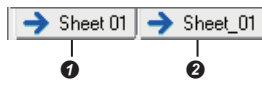
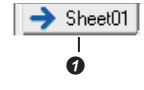
When opening a PX Developer format project, data names of a PX Developer project are changed as follows:

- A data name is suffixed with "_PX."
- An invalid character used for a data name is changed to an "_" (underscore).

Therefore, the data name may be duplicated and the project data change may be canceled.

Correct the data name of PX Developer format project, and open the project again.

The following shows the example of duplication and the correction method.

| Duplication example | Correction method |
|--|---|
| <p>Open a PX Developer format project including the following ❶ and ❷ in GX Works3.</p> <p>❶ Program POU of a PX Developer project (data name: POU)</p>  <p>❷ Program body of a GX Works2 project (data name: POU_PX)</p>  <p>When opening the project, the data name ❶ is suffixed with "_PX." (The data name ❷ is not changed.)</p> <p>❶: POU → POU_PX ❷: POU_PX</p> <p>Since the data names ❶ and ❷ are duplicated, the data change is canceled.</p> | <p>Open the project again after deleting "_PX" in the data name ❷ as follows:</p> <ul style="list-style-type: none">• ❷: POU_PX → POU  <p>When opening the project, the data name ❶ is suffixed with "_PX." (The data name ❷ is not changed.)</p> <p>❶: POU → POU_PX ❷: POU</p> <p>The data change continues since the data names ❶ and ❷ are not duplicated.</p> |
| <p>Open a PX Developer format project including the following ❶ and ❷ in GX Works3.</p> <p>❶ FBD sheet of a PX Developer project (data name: Sheet 01)</p> <p>❷ FBD sheet of a PX Developer project (data name: Sheet_01)</p>  <p>When opening the project, a invalid character (space) in the data name ❶ is changed to an "_". Moreover, both data names ❶ and ❷ are suffixed with "_PX."</p> <p>❶: Sheet 01 → Sheet_01_PX ❷: Sheet_01 → Sheet_01_PX</p> <p>Since the data names ❶ and ❷ are duplicated, the data change is canceled.</p> | <p>Open the project again after deleting the invalid character (space) in the data name ❶ as follows:</p> <ul style="list-style-type: none">• ❶: Sheet 01 → Sheet01  <p>When opening the project, both data names ❶ and ❷ are suffixed with "_PX."</p> <p>❶: sheet 01 → sheet01_PX ❷: sheet_01 → sheet_01_PX</p> <p>The data change continues since the data names ❶ and ❷ are not duplicated.</p> |

■Label area capacity

When a PX Developer format project is opened in GX Works3, if the value of "Use Volume" exceeds that of "Total Capacity" in the "Device/Label Memory Configuration" screen of a GX Works3 format project, "0 K Word" is set for "Label Area Capacity" and "Latch Label Area Capacity." (Page 117 Label area capacity)

In that case, check the changes in the "Output" window, and correct "CPU Parameter" in the GX Works3 format project according to the label capacity on the project.

Replacement of a GX Developer format project



The following explains the methods for replacing data to use a GX Developer format project in the GX Works3 format.

Only the projects for QSCPUs can be used in the GX Works3 format.

For details on the conversion processing for each data, refer to the following:

 Page 127 Opening a GX Developer format project







For details on a MELSEC iQ-R series safety project, refer to the following:

-  Page 30 Safety system
-  MELSEC iQ-R Safety Application Guide


Programs

Programs in a GX Developer format project are replaced with standard programs.


The following shows the procedure to correct a standard program to a safety program.

1. Create safety program data in GX Works3. ( Page 132 Creating data)
2. Cut a ladder to be used in a safety program and paste it to the safety program according to the execution order.
Example: a ladder including a safety device
3. Change any devices to safety ones which can be edited in a GX Works3 format project. ( Page 965 Devices)
4. Change the standard devices/labels used in both standard and safety programs to standard/safety shared labels.
( Page 966 Standard/safety shared labels)
5. Change the labels to be used in a safety program to the safety labels. ( Page 967 Safety labels)
6. Redefine the function blocks. ( Page 967 Safety FBs, Page 968 User-defined FBs)
7. Convert (reassign) all the programs. ( Page 432 Converting Programs)

Point

Ladders to be used in a safety program can be checked in GX Developer. For details, refer to the following:
 GX Developer Version 8 Operating Manual (Safety Programmable Controller)

Devices

The following devices need to be changed to safety devices which can be edited in a GX Works3 format project. ( Page 931 Applicable devices in a safety project (safety devices))

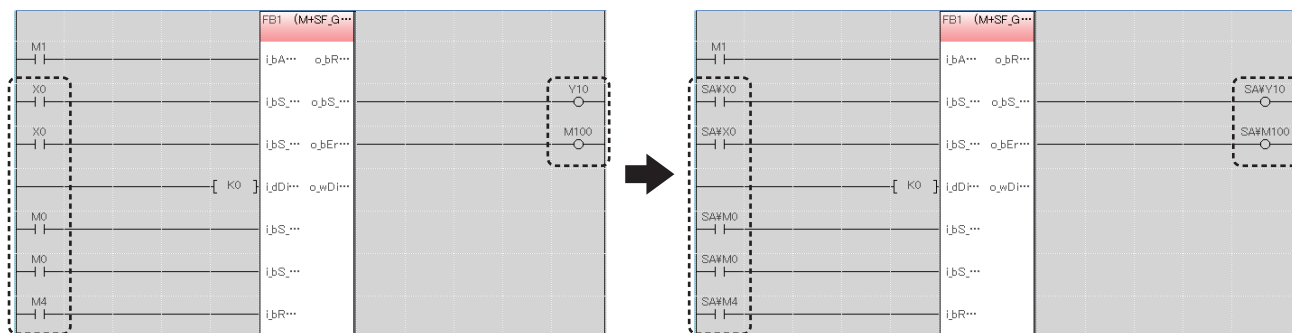
- Safety device used in a GX Developer format project
- Standard device used only in a safety program of a GX Works3 format project


Check the corresponding devices in GX Developer, then change them to safety devices by following the procedure below.

Operating procedure

Prefix the corresponding device names with "SA\." ( Page 463 Searching for/Replacing Devices and Labels)

Ex.



M1 is the device used for passing data between a standard program and a safety program. This device needs to be changed to a standard/safety shared label. ( Page 966 Standard/safety shared labels)

■Devices that are not supported by MELSEC iQ-R series modules

Devices which are not supported by MELSEC iQ-R series modules are replaced with SM4095/SD4095. Among these devices, the ones used as instruction arguments may be replaced with a character string (SM4095 or SD4095). To search for these character strings, refer to the following:

 Page 466 Searching for/Replacing Character Strings

■When device values are set in the device memory

When replacing a device to a safety device, set the value of the device set in the device memory again as the value of the safety device.



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Standard/safety shared labels

If a standard device/label is used to pass data between standard and safety programs, the device/label needs to be changed to a standard/safety shared label. Correct the standard device/label and the program by following the procedure below.

Operating procedure

■Standard devices


1. Create a new standard/safety shared label. ^{*1} ( Page 132 Creating data)
2. Register a label in the global editor for standard/safety shared labels. ( Page 235 Registering Labels)
3. Change the standard device used in a safety program to the registered label.
4. Add a ladder to pass data between the standard and safety programs in the standard program.

For the method to pass data between standard and safety programs, refer to the following:

 MELSEC iQ-R Safety Application Guide

^{*1} Select "Standard/Safety Shared" for "Category" in the "New Data" screen.

■Labels


1. Create a new standard/safety shared label. ^{*1} ( Page 132 Creating data)
2. Cut the label in the label editor and paste it to the global label editor for standard/safety shared labels. ^{*2}
3. Define the global label that became undefined on the program editor. ^{*3}
4. Add a ladder to pass data between the standard and safety programs in the standard program.

For the method to pass data between standard and safety programs, refer to the following:

 MELSEC iQ-R Safety Application Guide

^{*1} Select "Standard/Safety Shared" for "Category" in the "New Data" screen.

^{*2} To change a local label to a standard/safety shared label, its class needs to be corrected. For details on the classes that can be set for standard/safety shared labels, refer to the following:

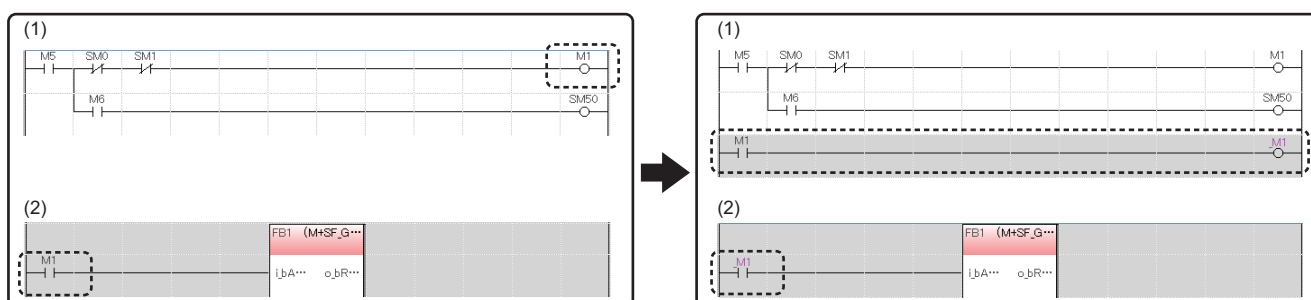
 MELSEC iQ-R CPU Module User's Manual (Application)

^{*3} Labels are automatically defined if the following option is set to "Synchronize":

·[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Label Synchronization" ⇒ "Operational Setting" ⇒ "Operation on Editing Label Editor"

Ex.

When changing a standard device (M1) used in a standard program (1) and a safety program (2) to a standard/safety shared label (_M1)





Safety labels

Labels to be used in a safety program needs to be changed to safety labels.
Change global labels and local labels to safety labels by the following procedure.

Operating procedure

■Global labels

1. Create a new safety global label.*¹ ( Page 132 Creating data)
2. Cut the label in the global label editor and paste it to the label editor for safety global labels. ( Page 235 Registering Labels)
3. Change the device assigned to the label to a safety device.
4. Define the global label that became undefined on the program editor.*²

*¹ Select "Safety" for "Category" in the "New Data" screen.

*² Labels are automatically defined if the following option is set to "Synchronize":

[Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Label Synchronization" ⇒ "Operational Setting" ⇒ "Operation on Editing Label Editor"

■Local labels



Cut a label in the local label editor of a standard program, and paste it to the local label editor of a safety program.

Safety FBs

Safety FBs are changed to undefined function blocks. In addition, their function block names are changed to function block names in a safety FB library of the MELSEC iQ-R series.

Redefine undefined function blocks by following the procedure below.

Operating procedure

1. Register a safety FB library for MELSEC iQ-R series in GX Works3. ( Page 536 Enhanced Use of Application Library/MELSOFT Library)
2. Drag and drop the registered safety FB library onto "FB/FUN" in the navigation window.
3. Select and right-click the undefined function block in a program editor, and then select [Edit] ⇒ [Update FB/FUN] from the shortcut menu.
4. Read the displayed message, and click the [OK] button.
5. Select and right-click its FB instance name. Select [Edit] ⇒ [Edit FB Instance] from the shortcut menu, then change the name. ( Page 285 Changing an FB instance name)

The function block is defined.





- To obtain the safety FB library, please contact your local Mitsubishi Electric sales office or representative.

User-defined FBs

To use user-defined FBs that are used in a standard program in a safety program, replace data by following the procedure below.

Operating procedure

1. Cut a user-defined FB to be used in a safety program, and paste it to the safety program according to the execution order.
2. Cut the FB instance of the user-defined FB in the local label editor of the standard program, and paste it to the local label editor of the safety program.
3. Create a safety FB. *1 ( Page 132 Creating data)
4. Cut the program and all local labels of the user-defined FB and paste them to the safety FB respectively.
5. Change the devices used in the program of the user-defined FB to safety devices. ( Page 965 Devices)
6. Set the safety FB created in step 3 for the data type of the FB instance label in the local label editor of the safety program.

*1 Select "Safety" for "Category" in the "New Data" screen.

Precautions

To change a part of a program in a user-defined FB to a safety FB, create a safety FB, then divide the processing to the user-defined FB (standard FB) and to the safety FB.

Appendix 8 XML File Formats (IEC61131-10 Format)

This section explains the elements to be imported among the elements in an XML file compliant with IEC61131-10.

For elements not defined in IEC61131-10, only the ones described in 'AddData' can be imported.

If required elements are not included in the XML file at the import, the default value is set.

For the operation procedure to import elements from an XML file compliant with IEC61131-10, refer to the following:

☞ Page 138 Importing data (IEC61131-10 XML format)

Program elements

The following shows the default values when elements and settings of a program to be imported do not exist.

Elements to be imported

■Program block

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Program block | ■IEC61131-10 Project/Types/GlobalNamespace/Program | Not created. |

■Program block property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---------------------------------|---|--|
| Data name (Example: ProgPou) | ■IEC61131-10 Project/Types/GlobalNamespace/Program.name | Not created. |
| Title | ■AddData Project/Types/GlobalNamespace/Program/AddData/Data/ PouProperties.title | None |
| Update date and time | ■AddData Project/Types/GlobalNamespace/Program/AddData/Data/ PouProperties.modificationDateTime | Date and time of the import |
| Category ^{*1} | ■AddData Project/Types/GlobalNamespace/Program/AddData/Data/ PouProperties.safety | Standard ^{*2} |
| Type (Example: Program) | ■IEC61131-10 Project/Types/GlobalNamespace/Program | Not created. |
| Program language | ■IEC61131-10 Project/Types/GlobalNamespace/Program/MainBody/BodyContent/xsi:type | Not created. |
| Version | ■AddData Project/Types/GlobalNamespace/Program/AddData/Data/ PouProperties.version | None |
| Help path information | ■AddData Project/Types/GlobalNamespace/Program/AddData/Data/ PouProperties.helpFilePath | None |
| Comment | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Documentation | None |

*1 Imported only for RnSFCPU and RnPSFCPU.

*2 Can be set only for RnSFCPU and RnPSFCPU.

■Local label

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Local label | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Vars (Only when the attribute 'accessSpecifier' is 'private'.) | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/TempVars | |

■Local label information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---|--|---|
| Label name | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Vars/Variable.name | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/TempVars/Variable.name | |
| Data type | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Vars/Variable/Type | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/TempVars/Variable/Type | |
| Class | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Vars.constant | Label class not including an attribute of '_CONSTANT' and '_RETAIN' (Example: VAR) |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Vars.retain | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/TempVars.constant | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/TempVars.retain | |
| Initial value (Other than FB instance) | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Vars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/TempVars/Variable/InitialValue/ SimpleValue.value | |
| Initial value (FB instance) | ■AddData Project/Types/GlobalNamespace/Program/Vars/Variable/AddData/Data/ VariableFbInitialValue | None |
| | ■AddData Project/Types/GlobalNamespace/Program/TempVars/Variable/AddData/ Data/VariableFbInitialValue | |
| Constant | ■IEC61131-10 Project/Types/GlobalNamespace/Program/Vars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/TempVars/Variable/InitialValue/ SimpleValue.value | |
| Comment | ■AddData Project/Types/GlobalNamespace/Program/Vars/Variable/AddData/Data/ VariableComments | None |
| | ■AddData Project/Types/GlobalNamespace/Program/TempVars/Variable/AddData/ Data/VariableComments | |
| Line number | ■AddData Project/Types/GlobalNamespace/Program/Vars/Variable/AddData/Data/ VariableLineNumber.number | Free line number |
| | ■AddData Project/Types/GlobalNamespace/Program/TempVars/Variable/AddData/ Data/VariableLineNumber.number | |

■Local label property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Data name | — | Local label |
| Title | — | Title of the program block property |
| Update date and time | ■AddData Project/Types/GlobalNamespace/Program/AddData/Data/ LocalVarsProperties.modificationDateTime | Date and time of the import |
| Category | — | Category of the program block property* ¹ |
| Comment | — | Comment of the program block property |

*¹ Can be set only for RnSFCPU and RnPSFCPU.

■Program body

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Program body | ■IEC61131-10 Project/Types/GlobalNamespace/Program/MainBody | Not created. |

■Program body information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Body | ■IEC61131-10 Project/Types/GlobalNamespace/Program/MainBody/BodyContent/ST | Not created. |

■Program body property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|---|
| Data name | ■AddData Project/Types/GlobalNamespace/Program/MainBody/AddData/Data/ BodyProperties.workSheetName | <ul style="list-style-type: none"> • 1st data name: Program body • 2nd data name or later: Program body_n ('n' is a sequential number starting from 2.) |
| Title | — | Title of the program block property |
| Update date and time | ■AddData Project/Types/GlobalNamespace/Program/MainBody/AddData/Data/ BodyProperties.modificationDateTime | Date and time of the import |
| Category | — | Category of the program block property* ¹ |
| Program language | — | Program language of the program block property |
| Comment | — | Comment of the program block property |

*¹ Can be set only for RnSFCPU and RnPSFCPU.

■Worksheet execution order setting

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Execution order | ■AddData Project/Types/GlobalNamespace/Program/MainBody/AddData/Data/ BodyProperties.executeOrder | Registration order |

■Program registration

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|--|--|--|
| <ul style="list-style-type: none"> • Initial • Scan • Fixed scan • Event • Standby • No execution type | ■IEC61131-10 Project/Instances/Configuration/Resource/ProgramInstance | Unregistered program |

■Cancellation of program registration

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Unregistered program | ■IEC61131-10 Project/Instances/Configuration/Resource/ProgramInstance | Unregistered program |

■Program file

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Program file | ■IEC61131-10 Project/Instances/Configuration/Resource | Not created. |

■Program file setting

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Execution order | ■IEC61131-10 Project/Instances/Configuration/Resource/ ProgramInstance.evaluationOrder | Registration order |

■Execution type of a program file

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|--|--|--|
| <ul style="list-style-type: none"> • Initial • Scan • Fixed scan • Event • Standby • No execution type | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ ResourceExecutionType.type | No execution type |

■Display order in the navigation window of a program

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---|---------------------|--|
| Display order in the navigation window of a program | — | Registration order |

■Program file property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---|---|--|
| Data name (Example: MAIN) | ■IEC61131-10 Project/Instances/Configuration/Resource.name | Not created. |
| Title | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ ProgramFileProperties.title | None |
| Update date and time | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ ProgramFileProperties.modificationDateTime | Date and time of the import |
| Category ^{*1} | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ ProgramFileProperties.safety | Standard ^{*2} |
| Type (Example: Program file) | — | Program file |
| Use the process control extension ^{*3} | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ ProgramFileProperties.isProcessControlExpansion | No |
| Comment | ■IEC61131-10 Project/Instances/Configuration/Resource/Documentation | None |

*1 Imported only for RnSFCPU and RnPSFCPU.

*2 Can be set only for RnSFCPU and RnPSFCPU.

*3 Imported only in either of the following cases:

- The CPU module is an RnPCPU.
- The CPU module is an RnPSFCPU and the category is "Standard."

■User folder

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| User folder | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ResourceFolders/ ResourceFolder | Not created. |

■User folder property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Folder name | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ResourceFolders/ ResourceFolder.name | Not created. |
| Update date and time | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ResourceFolders/ ResourceFolder.modificationDateTime | Date and time of the import |
| Category | — | Category of the program file property ^{*1} |
| Comment | ■AddData Project/Instances/Configuration/Resource/AddData/Data/ResourceFolders/ ResourceFolder/Documentation | None |

*1 Can be set only for RnSFCPU and RnPSFCPU.

■Registration to a user folder

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|-------------------------------|--|--|
| Registration to a user folder | ■AddData Project/Instances/Configuration/Resource/ProgramInstance/AddData/Data/ PouResourceFolder.name | Not registered. |

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Function block elements

The following shows the default values when elements and settings of a function block to be imported do not exist.

Elements to be imported

■Function block

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Function block | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock | Not created. |

■Function block property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---|---|--|
| Data name (Example: FbPouN) | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock.name | Not created. |
| Title | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ PouProperties.title | None |
| Update date and time | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ PouProperties.modificationDateTime | Date and time of the import |
| Category ^{*1} | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ PouProperties.safety | Standard ^{*2} |
| Type (Example: Function block) | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock | Not created. |
| Program language | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/MainBody/BodyContent/ xsi:type | Not created. |
| FB Type (Example: Subroutine type, macro type) | — | FB type of an FB file |
| Use MC/MCR to Control EN | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ FbPouProperties.isMcMcr | No |
| Use EN/ENO | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ FbPouProperties.isEnEno | No |
| Label reserved area | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ FbPouProperties.labelAssignmentArea | <ul style="list-style-type: none"> • Entry availability^{*3}: 48 • Entry availability^{*4}: None |
| Latch label reserved area | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ FbPouProperties.latchLabelAssignmentArea | <ul style="list-style-type: none"> • Entry availability^{*3}: 16 • Entry availability^{*4}: None |
| Signal flow reserved area | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ FbPouProperties.signalFlowAssignmentArea | <ul style="list-style-type: none"> • Entry availability^{*3}: 4 • Entry availability^{*4}: None |
| Version | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ PouProperties.version | None |
| Help path information | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ PouProperties.helpFilePath | None |
| Comment | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Documentation | None |

*1 Imported only for RnSFC CPUs and RnPSFC CPUs.

*2 Can be set only for RnSFC CPUs and RnPSFC CPUs.

*3 Status that the following option is set to "Yes":

· [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Set Reserved Area"

*4 Status that the following option is set to "No":

· [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Function Block" ⇒ "Enable to Set Reserved Area"

■Local label of a function block

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---------------------------------|--|--|
| Local label of a function block | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars (When the attribute 'accessSpecifier' is 'private.') | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/TempVars | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InoutVars | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InputVars | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/OutputVars | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars (When the attribute 'accessSpecifier' is 'public.') | |

Local label information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|---|
| Label name | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars/Variable.name | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/TempVars/Variable.name | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InoutVars/ Variable.name | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InputVars/ Variable.name | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/OutputVars/ Variable.name | |
| Data type | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars/Variable/Type | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/TempVars/Variable/Type | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InoutVars/ Variable/Type | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InputVars/ Variable/Type | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/OutputVars/ Variable/Type | |
| Class | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars.constant | Label class not including an attribute of '_CONSTANT' and '_RETAIN' (Example: VAR, VAR_INPUT, VAR_OUTPUT, VAR_IN_OUT, VAR_PUBLIC) |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars.retain | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/TempVars.constant | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/TempVars.retain | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/ OutputVars.retain | |
| Initial value | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/TempVars/Variable/ InitialValue/SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InputVars/ Variable/InitialValue/SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/OutputVars/ Variable/InitialValue/SimpleValue.value | |

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Constant | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Vars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/TempVars/Variable/ InitialValue/SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/InputVars/ Variable/InitialValue/SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/Parameters/OutputVars/ Variable/InitialValue/SimpleValue.value | |
| Comment | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Vars/Variable/AddData/ Data/VariableComments | None |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/TempVars/Variable/ AddData/Data/VariableComments | |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Parameters/InoutVars/ Variable/AddData/Data/VariableComments | |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Parameters/InputVars/ Variable/AddData/Data/VariableComments | |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Parameters/OutputVars/ Variable/AddData/Data/VariableComments | |
| Line number | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Vars/Variable/AddData/ Data/VariableLineNumber.number | Free line number |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/TempVars/Variable/ AddData/Data/VariableLineNumber.number | |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Parameters/InoutVars/ Variable/AddData/Data/VariableLineNumber.number | |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Parameters/InputVars/ Variable/AddData/Data/VariableLineNumber.number | |
| | ■AddData Project/Types/GlobalNamespace/FunctionBlock/Parameters/OutputVars/ Variable/AddData/Data/VariableLineNumber.number | |

■Local label property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|---|
| Data name | — | Local label |
| Title | — | Title of the function block property |
| Update date and time | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ LocalVarsProperties.modificationDateTime | Date and time of the import |
| Category | — | Category of the function block property ^{*1} |
| Comment | — | Comment of the function block property |

*1 Can be set only for RnSFCPU and RnPSFCPU.

■Program body

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Program body | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/MainBody | Not created. |

■Program body information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Body | ■IEC61131-10 Project/Types/GlobalNamespace/FunctionBlock/MainBody/BodyContent/ ST | Not created. |

■Program body property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|---|
| Data name | ■AddData Project/Types/GlobalNamespace/FunctionBlock/MainBody/AddData/Data/ BodyProperties.workSheetName | <ul style="list-style-type: none"> • 1st data name: Program body • 2nd data name or later: Program body_n ('n' is a sequential number starting from 2.) |
| Title | — | Title of the function block property |
| Update date and time | ■AddData Project/Types/GlobalNamespace/FunctionBlock/MainBody/AddData/Data/ BodyProperties.modificationDateTime | Date and time of the import |
| Category | — | Category of the function block property ^{*1} |
| Program language | — | Program language of the function block property |
| Comment | — | Comment of the function block property |

*1 Can be set only for RnSFCPU and RnPSFCPU.

■Worksheet execution order setting

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Execution order | ■AddData Project/Types/GlobalNamespace/FunctionBlock/MainBody/AddData/Data/ BodyProperties.executeOrder | Registration order |

■FB file

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| FB file | ■AddData Project/Types/GlobalNamespace/AddData/Data/FbFiles/FbFile | Not created. |

■FB file property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---|--|--|
| Data name | ■AddData Project/Types/GlobalNamespace/AddData/Data/FbFiles/FbFile.name | Not created. |
| Update date and time | ■AddData Project/Types/GlobalNamespace/AddData/Data/FbFiles/ FbFile.modificationDateTime | Date and time of the import |
| Category ^{*1} | ■AddData Project/Types/GlobalNamespace/AddData/Data/FbFiles/FbFile.safety | Standard ^{*2} |
| Type (Example: FB file) | ■AddData Project/Types/GlobalNamespace/AddData/Data/FbFiles/FbFile | Not created. |
| FB type (Example: Subroutine type, macro type) | ■AddData Project/Types/GlobalNamespace/AddData/Data/FbFiles/ FbFile.functionBlockType | Subroutine type |

*1 Imported only for RnSFCPU and RnPSFCPU.

*2 Can be set only for RnSFCPU and RnPSFCPU.

■Registration to an FB file

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|----------------------------|---|--|
| Registration to an FB file | ■AddData Project/Types/GlobalNamespace/FunctionBlock/AddData/Data/ FbPouFile.name | Not registered. |

A

Function elements

The following shows the default values when elements and settings of a function to be imported do not exist.

Elements to be imported

■Function

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Function | ■IEC61131-10 Project/Types/GlobalNamespace/Function | Not created. |

■Function property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|--------------------------------|--|--|
| Data name (Example: FunPou) | ■IEC61131-10 Project/Types/GlobalNamespace/Function.name | Not created. |
| Title | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/ PouProperties.title | None |
| Update date and time | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/ PouProperties.modificationDateTime | Date and time of the import |
| Category ^{*1} | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/ PouProperties.safety | Standard ^{*2} |
| Type (Example: Function) | ■IEC61131-10 Project/Types/GlobalNamespace/Function | Not created. |
| Program language | ■IEC61131-10 Project/Types/GlobalNamespace/Function/MainBody/BodyContent/xsi:type | Not created. |
| Return value type | ■IEC61131-10 Project/Types/GlobalNamespace/Function/ResultType | None |
| Use EN/ENO | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/ FunPouProperties.isEnEno | No |
| Version | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/ PouProperties.version | None |
| Help path information | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/ PouProperties.helpFilePath | None |
| Comment | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Documentation | None |

*1 Imported only for RnSF CPUs and RnPSF CPUs.

*2 Can be set only for RnSF CPUs and RnPSF CPUs.

■Local label

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Local label | ■IEC61131-10 Project/Types/GlobalNamespace/Function/TempVars | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/InputVars | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/OutputVars | |

■Local label information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|---|
| Label name | ■IEC61131-10 Project/Types/GlobalNamespace/Function/TempVars/Variable.name | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/InputVars/ Variable.name | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/OutputVars/ Variable.name | |
| Data type | ■IEC61131-10 Project/Types/GlobalNamespace/Function/TempVars/Variable/Type | Not created. |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/InputVars/Variable/ Type | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/OutputVars/ Variable/Type | |
| Class | ■IEC61131-10 Project/Types/GlobalNamespace/Function/TempVars.constant | Label class not including an attribute of '_CONSTANT' and '_RETAIN' (Example: VAR, VAR_INPUT, VAR_OUTPUT) |
| Initial value | ■IEC61131-10 Project/Types/GlobalNamespace/Function/TempVars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/InputVars/Variable/ InitialValue/SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/OutputVars/ Variable/InitialValue/SimpleValue.value | |
| Constant | ■IEC61131-10 Project/Types/GlobalNamespace/Function/TempVars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/InputVars/Variable/ InitialValue/SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Function/Parameters/OutputVars/ Variable/InitialValue/SimpleValue.value | |
| Comment | ■AddData Project/Types/GlobalNamespace/Function/TempVars/Variable/AddData/ Data/VariableComments | None |
| | ■AddData Project/Types/GlobalNamespace/Function/Parameters/InputVars/Variable/ AddData/Data/VariableComments | |
| | ■AddData Project/Types/GlobalNamespace/Function/Parameters/OutputVars/ Variable/AddData/Data/VariableComments | |

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Line number | ■AddData Project/Types/GlobalNamespace/Function/TempVars/Variable/AddData/Data/VariableLineNumber.number | Free line number |
| | ■AddData Project/Types/GlobalNamespace/Function/Parameters/InputVars/Variable/AddData/Data/VariableLineNumber.number | |
| | ■AddData Project/Types/GlobalNamespace/Function/Parameters/OutputVars/Variable/AddData/Data/VariableLineNumber.number | |

■Local label property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Data name | — | Local label |
| Title | — | Title of the function property |
| Update date and time | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/LocalVarsProperties.modificationDateTime | Date and time of the import |
| Category | — | Category of the function property ^{*1} |
| Comment | — | Comment of the function property |

*1 Can be set only for RnSFCPU and RnPSFCPU.

■Program body

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Program body | ■IEC61131-10 Project/Types/GlobalNamespace/Function/MainBody | Not created. |

■Program body information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Body | ■IEC61131-10 Project/Types/GlobalNamespace/Function/MainBody/BodyContent/ST | Not created. |

■Program body property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|---|
| Data name | ■AddData Project/Types/GlobalNamespace/Function/MainBody/AddData/Data/ BodyProperties.workSheetName | <ul style="list-style-type: none"> 1st data name: Program body 2nd data name or later: Program body_n (‘n’ is a sequential number starting from 2.) |
| Title | — | Title of the function property |
| Update date and time | ■AddData Project/Types/GlobalNamespace/Function/MainBody/AddData/Data/ BodyProperties.modificationDateTime | Date and time of the import |
| Category | — | Category of the function property ^{*1} |
| Program language | — | Program language of the function property |
| Comment | — | Comment of the function property |

*1 Can be set only for RnSFCPU and RnPSFCPU.

■Worksheet execution order setting

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Execution order | ■AddData Project/Types/GlobalNamespace/Function/MainBody/AddData/Data/ BodyProperties.executeOrder | Registration order |

■FUN file

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| FUN file | ■AddData Project/Types/GlobalNamespace/AddData/Data/FunFiles/FunFile | Not created. |

■FUN file property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|-----------------------------|--|--|
| Data name | ■AddData Project/Types/GlobalNamespace/AddData/Data/FunFiles/FunFile.name | Not created. |
| Update date and time | ■AddData Project/Types/GlobalNamespace/AddData/Data/FunFiles/ FunFile.modificationDateTime | Date and time of the import |
| Category ^{*1} | ■AddData Project/Types/GlobalNamespace/AddData/Data/FunFiles/FunFile.safety | Standard ^{*2} |
| Type (Example: FUN file) | ■AddData Project/Types/GlobalNamespace/AddData/Data/FunFiles/FunFile | FUN file |

*1 Imported only for RnSFCPU and RnPSFCPU.

*2 Can be set only for RnSFCPU and RnPSFCPU.

■Registration to an FUN file

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|-----------------------------|---|--|
| Registration to an FUN file | ■AddData Project/Types/GlobalNamespace/Function/AddData/Data/ FunPouFile.name | Not registered. |

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Structure elements

The following shows the default values when elements and settings of a structure to be imported do not exist.

Elements to be imported

■Structure

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Structure | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDecl/UserDefinedTypeSpec/ StructTypeSpec | Not created. |

■Structure property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------------|---|---|
| Data name | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDecl/.name | Not created. |
| Title | ■AddData Project/Types/GlobalNamespace/DataTypeDecl/AddData/Data/ DataTypeProperties.title | None |
| Update date and time | ■AddData Project/Types/GlobalNamespace/DataTypeDecl/AddData/Data/ DataTypeProperties.modificationDateTime | Date and time of the import |
| Category | — | Standard* ¹ |
| Type (Example: Structure) | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDecl/UserDefinedTypeSpec/ StructTypeSpec | Not created. |
| Reserved area | ■AddData Project/Types/GlobalNamespace/DataTypeDecl/AddData/Data/ DataTypeProperties.reservedArea | <ul style="list-style-type: none"> • Entry availability*²: 0 • Entry availability*³: None |
| Version | ■AddData Project/Types/GlobalNamespace/DataTypeDecl/AddData/Data/ DataTypeProperties.version | None |
| Help path information | ■AddData Project/Types/GlobalNamespace/DataTypeDecl/AddData/Data/ DataTypeProperties.helpFilePath | None |
| Comment | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDecl/Documentation | None |

*¹ Can be set only for RnSFCPU and RnPSFCPU.

*² Status that the following option is set to "Yes":

· [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Structured Data Type" ⇒ "Enable to Set Reserved Area"

*³ Status that the following option is set to "No":

· [Tool] ⇒ [Options] ⇒ "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Structured Data Type" ⇒ "Enable to Set Reserved Area"

■Local label

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Local label | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDecl/UserDefinedTypeSpec/ StructTypeSpec/Member | Not created. |

■Local label information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Label name | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDefl/UserDefinedTypeSpec/ StructTypeSpec/Member.name | Not created. |
| Data type | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDefl/UserDefinedTypeSpec/ StructTypeSpec/Member/Type | Not created. |
| Initial value | ■IEC61131-10 Project/Types/GlobalNamespace/DataTypeDefl/UserDefinedTypeSpec/ StructTypeSpec/Member/InitialValue/SimpleValue.value | None |
| Comment | ■AddData Project/Types/GlobalNamespace/DataTypeDefl/UserDefinedTypeSpec/ StructTypeSpec/Member/AddData/Data/VariableComments | None |
| Line number | ■AddData Project/Types/GlobalNamespace/DataTypeDefl/UserDefinedTypeSpec/ StructTypeSpec/Member/AddData/Data/VariableLineNumber.number | Free line number |

Global label elements

The following shows the default values when elements and settings of a global label to be imported do not exist.

Elements to be imported

■Global label list

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|---|--|
| Global label list | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars | Not created. |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars | |

■Global label property

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---------------------------------|--|--|
| Data name | ■AddData Project/Instances/Configuration/Resource/GlobalVars/AddData/Data/ GlobalVarsProperties.name | Global |
| | ■AddData Project/Instances/Configuration/GlobalVars/AddData/Data/ GlobalVarsProperties.name | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/AddData/Data/ GlobalVarsProperties.name | |
| Title | ■AddData Project/Instances/Configuration/Resource/GlobalVars/AddData/Data/ GlobalVarsProperties.title | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/AddData/Data/ GlobalVarsProperties.title | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/AddData/Data/ GlobalVarsProperties.title | |
| Update date and time | ■AddData Project/Instances/Configuration/Resource/GlobalVars/AddData/Data/ GlobalVarsProperties.modificationDateTime | Date and time of the import |
| | ■AddData Project/Instances/Configuration/GlobalVars/AddData/Data/ GlobalVarsProperties.modificationDateTime | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/AddData/Data/ GlobalVarsProperties.modificationDateTime | |
| Category ^{*1} | ■AddData Project/Instances/Configuration/Resource/GlobalVars/AddData/Data/ GlobalVarsProperties.safety | Standard ^{*2} |
| | ■AddData Project/Instances/Configuration/GlobalVars/AddData/Data/ GlobalVarsProperties.safety | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/AddData/Data/ GlobalVarsProperties.safety | |
| Type (Example: Global label) | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars | Not created. |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars | |

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Version | ■AddData Project/Instances/Configuration/Resource/GlobalVars/AddData/Data/ GlobalVarsProperties.version | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/AddData/Data/ GlobalVarsProperties.version | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/AddData/Data/ GlobalVarsProperties.version | |
| Help path information | ■AddData Project/Instances/Configuration/Resource/GlobalVars/AddData/Data/ GlobalVarsProperties.helpFilePath | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/AddData/Data/ GlobalVarsProperties.helpFilePath | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/AddData/Data/ GlobalVarsProperties.helpFilePath | |
| Comment | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars/Documentation | None |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars/Documentation | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars/Documentation | |

*1 Imported only for RnSFCPU and RnPSFCPU.

*2 Can be set only for RnSFCPU and RnPSFCPU.

■Global label

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|------------------------|--|--|
| Global label | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars/Variable | Not created. |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars/Variable | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars/Variable | |

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■Global label information

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|---|---|---|
| Label name | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars/Variable.name | Not created. |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars/Variable.name | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars/Variable.name | |
| Data type | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars/Variable/Type | Not created. |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars/Variable/Type | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars/Variable/Type | |
| Class | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars.constant | Label class not including an attribute of '_CONSTANT' and '_RETAIN' (Example: VAR_GLOBAL) |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars.constant | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars.constant | |
| | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars.retain | |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars.retain | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars.retain | |
| Assignment (devices/labels) (Other than label) | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars/Variable/ Address.address | None |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars/Variable/Address.address | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars/Variable/ Address.address | |
| Initial value (Other than FB instance) | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars/Variable/InitialValue/ SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars/Variable/InitialValue/ SimpleValue.value | |
| Constant | ■IEC61131-10 Project/Instances/Configuration/Resource/GlobalVars/Variable/InitialValue/ SimpleValue.value | None |
| | ■IEC61131-10 Project/Instances/Configuration/GlobalVars/Variable/InitialValue/ SimpleValue.value | |
| | ■IEC61131-10 Project/Types/GlobalNamespace/Program/GlobalVars/Variable/InitialValue/ SimpleValue.value | |
| Comment | ■AddData Project/Instances/Configuration/Resource/GlobalVars/Variable/AddData/ Data/VariableComments | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/Variable/AddData/Data/ VariableComments | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/Variable/AddData/ Data/VariableComments | |

| Data name in GX Works3 | Element in XML file | Default value (Operation when no elements exists) |
|--------------------------------|---|--|
| Remark | ■AddData Project/Instances/Configuration/Resource/GlobalVars/Variable/AddData/ Data/VariableRemark/RemarkText | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/Variable/AddData/Data/ VariableRemark/RemarkText | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/Variable/AddData/ Data/VariableRemark/RemarkText | |
| System label relation | ■AddData Project/Instances/Configuration/Resource/GlobalVars/Variable/AddData/ Data/VariableSystemLabel.relation | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/Variable/AddData/Data/ LabelInfo/VariableSystemLabel.relation | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/Variable/AddData/ Data/VariableSystemLabel.relation | |
| System label name | ■AddData Project/Instances/Configuration/Resource/GlobalVars/Variable/AddData/ Data/VariableSystemLabel.name | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/Variable/AddData/Data/ VariableSystemLabel.name | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/Variable/AddData/ Data/VariableSystemLabel.name | |
| Attribute | ■AddData Project/Instances/Configuration/Resource/GlobalVars/Variable/AddData/ Data/VariableSystemLabel.attribute | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/Variable/AddData/Data/ VariableSystemLabel.attribute | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/Variable/AddData/ Data/VariableSystemLabel.attribute | |
| Access from an external device | ■AddData Project/Instances/Configuration/Resource/GlobalVars/Variable/AddData/ Data/VariableExternalDeviceAccess.isAccess | None |
| | ■AddData Project/Instances/Configuration/GlobalVars/Variable/AddData/Data/ VariableExternalDeviceAccess.isAccess | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/Variable/AddData/ Data/VariableExternalDeviceAccess.isAccess | |
| Line number | ■AddData Project/Instances/Configuration/Resource/GlobalVars/Variable/AddData/ Data/VariableLineNumber.number | Free line number |
| | ■AddData Project/Instances/Configuration/GlobalVars/Variable/AddData/Data/ VariableLineNumber.number | |
| | ■AddData Project/Types/GlobalNamespace/Program/GlobalVars/Variable/AddData/ Data/VariableLineNumber.number | |



Appendix 9 Considerations for Changing from FX5CPUs to RCPUs

This section explains the considerations when changing the module type from an FX5CPU to an RCPU.


Considerations before changing the module type

■Checking the security set to a project

When an element to which a block password and security key are set is included, the module type cannot be changed to an RCPU.

Delete the setting of a block password and a security key before changing the module type. (Block password:  Page 696
Deleting a block password, security key:  Page 700 Deleting a security key)

■Checking the security version set in a project



For a project whose security version is '2,' the module type cannot be changed to an RCPU. Change the security version to '1' before changing the module type. ( Page 723 When changing a security version from "2" to "1")

■Checking the representation recognized as an input (X) or output (Y) after changing the module type.

An element such as 'X08' or 'Y0F,' which is not recognized as a device in an FX5CPU, is not converted when changing the module type.

These elements are recognized as devices in an RCPU after the change. Correct them before changing the module type.

Procedure to change the module type

1. Check the project data before changing the module type. ( Page 990 Considerations before changing the module type)
2. Change the project for an FX5CPU to one used for an RCPU by changing the module type and operation mode.
3. Set the module configuration for the project after changing the module type and operation mode.
4. Set the parameter.
5. Correct the program. ( Page 992 Correction after changing the module type)

Replace inputs (X), outputs (Y), module specification numbers, and instructions.

Review the program according to the system configuration after changing the module type and operation mode.

6. Check the operation on the programmable controller.

Data to be changed when changing the module type

| Project data for an FX5CPU | | Description |
|---------------------------------------|--------------|--|
| Program Function Function block | Ladder*1 | Inputs (X) and outputs (Y) are converted to hexadecimal from octal. File registers (R) are replaced with file registers (ZR). |
| | ST | |
| | FBD/LD | Applied. |
| | SFC | |
| Program file management | Program file | |
| | FBFILE | |
| | FUNFILE | |
| Module Configuration Diagram | | Returns to the default. |
| System Parameter | | Returns to the default. |

| Project data for an FX5CPU | | Description |
|--------------------------------|--|---|
| CPU Parameter | Name Setting | Applied. |
| | Operation Related Setting | When it cannot be applied as it is, it will be changed according to the settings of the new module type. |
| | Interrupt Settings | |
| | Service Processing Setting | |
| | File Setting | |
| | RAS Setting | |
| | Program Setting | |
| | SFC Setting | |
| | Memory/Device Setting | When "Use" is set in the following CPU parameter, the number of step relay (S) points is applied. If "Not to Use" is set, the number of step relay (S) points will be changed to '0.' • "To Use or Not to Use SFC" |
| Module Parameter | Ethernet Port | Applied. If a module that cannot be set in a project for an RCPUCPU is specified as a communication destination, the module type cannot be changed. For numbers set for "Port No." in "Web Server Settings," the ones which cannot be set in a project for an RCPUCPU will be returned to the default. |
| | 485 Serial Port | Deleted. |
| | High Speed I/O | |
| | Input Response Time | |
| | Analog Input | |
| | Analog Output | |
| | Expansion Board | |
| Memory Card Parameter | Boot Setting | Applied. |
| | Setting of File/Data Use or Not in Memory Card | When it cannot be applied as it is, it will be changed according to the settings of the new module type. |
| Module Information | | Deleted. |
| Remote Password | | Returns to the default. |
| Structured Data Types | | The definitions of the module labels are deleted. |
| Label | Global Label | Inputs (X) and outputs (Y) are converted to hexadecimal from octal. File registers (R) are replaced with file registers (ZR). M+Global and all the data in M+Global are deleted. |
| | Local Label | Applied. |
| Device Memory | | Step relays (S) are deleted. |
| Device Comment | | Inputs (X) and outputs (Y) are converted to hexadecimal from octal. File registers (R) are replaced with file registers (ZR). Extended file registers (ER) are deleted. The data of SM4096 or later are deleted. The data of SD4096 or later are deleted. |
| Device Initial Value | | A device which cannot be used for a module after changing the module type is deleted. File registers (R) are replaced with file registers (ZR). The data of SD4096 or later are deleted. |
| Connection Destination Setting | | Returns to the default. |
| Options | | <ul style="list-style-type: none"> [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Device Comment Reference/Reflection Target": The setting value for file registers (R) is replaced with that for file registers (ZR). [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Display Connection of Ladder Diagram": Returns to the default. |
| Print Setting | | Returns to the default. |
| Properties for a project | | If "Compression" is selected for "File Size," it is changed to "Standard." |

*1 An instruction of which the argument specification is different exists in the module types before and after the change. When correcting a program, note that a device used for such an instruction is not converted at the module type change.

Correction after changing the module type

■Replacing devices

Inputs (X) and outputs (Y) are used sequentially from the start in FX5CPUs.

In RCPUs, inputs (X) and outputs (Y) are used in order from the number set to the start XY, and the numbers never duplicate between inputs (X) and outputs (Y).

Therefore, devices need to be replaced so that the device numbers of inputs (X) and outputs (Y) will not duplicate.

Ex.

When the system configuration before and after changing the module type is the following:

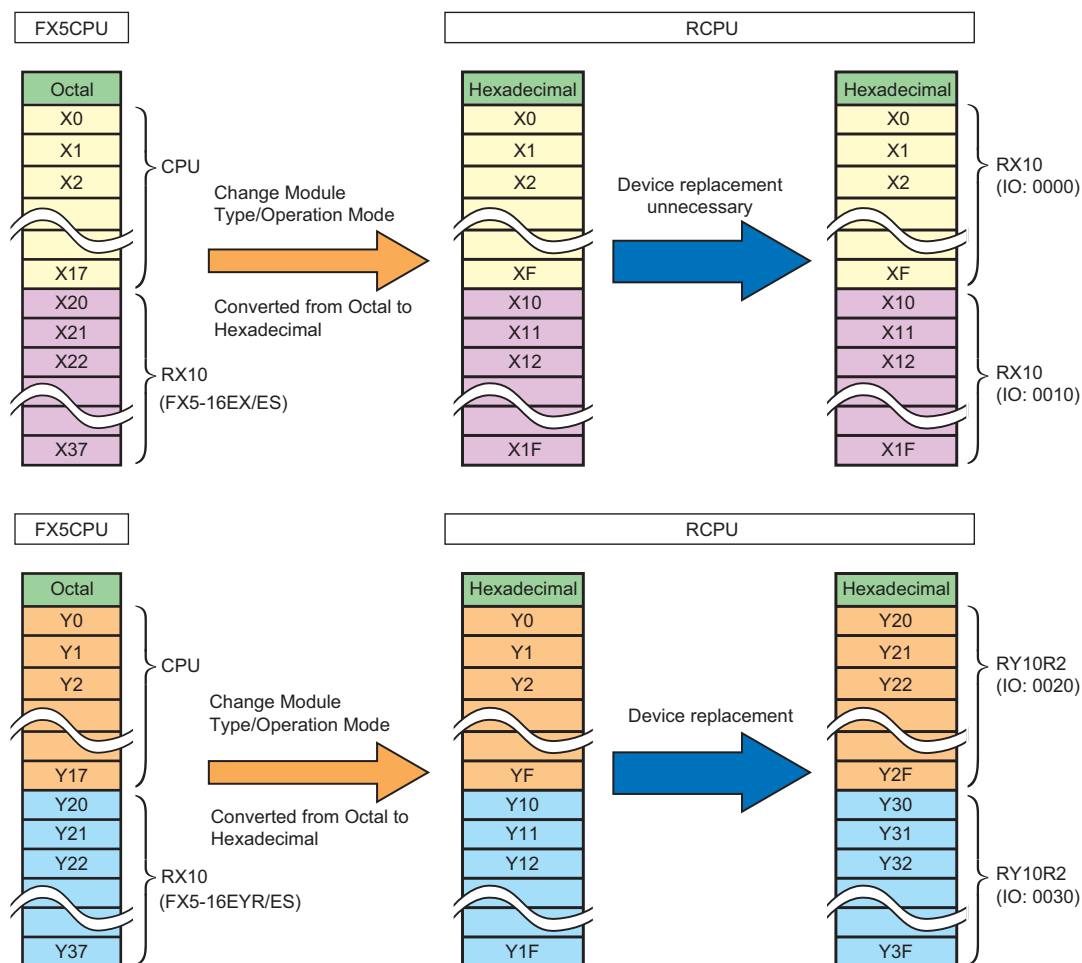
- System configuration for FX5CPUs

| Model name | Module type | Input | Output |
|--------------|---------------|-----------|-----------|
| FX5U-32MR/ES | CPU | 16 points | 16 points |
| FX5-16EX/ES | Input | 16 points | — |
| FX5-16EYR/ES | Output | — | 16 points |
| FX5-40SSC-S | Simple motion | — | — |

- System configuration for RCPUs

| Model name | Module type | Input | Output | Start XY |
|------------|---------------|-----------|-----------|----------|
| R04 | CPU | — | — | 3E00 |
| RX10 | Input | 16 points | — | 0000 |
| RX10 | Input | 16 points | — | 0010 |
| RY10R2 | Output | — | 16 points | 0020 |
| RY10R2 | Output | — | 16 points | 0030 |
| RD77MS4 | Simple motion | 32 points | 32 points | 0040 |

Correct a device number as shown below:



■Replacing module specification numbers

A module specification number can be replaced by using the Replace Device/Label function.
(Example: "U1"→"U4")

■Replacing instructions

An instruction which cannot be used for RCPUs is replaced with the one that can be used.
An instruction which cannot be used can be checked by an error occurring at conversion.

■Correcting FBD/LD programs

The number and the order of input/output arguments differ in some function elements between programs written for an FX5CPU and an RCPU in Function Block Diagram/Ladder Diagram language.

Those elements are displayed as undefined FUNs. Select [Edit] ⇨ [Update FB/FUN] to update the definition information, and correct the programs.

Appendix 10 Using the Simulation Function

Supported modules

The following shows the modules supported by the simulation function.

Modules supported by GX Simulator3

Even if any of following modules is in the system configuration of a project, the simulation can be performed without any errors.

| Series | Module type | | Module name |
|-------------|---|---------------------------|--|
| MELSEC iQ-R | Main base | | R35B, R38B, R312B, R310B-HT, R33B, R310RB, R38RB-HT |
| | Extension base | | R65B, R68B, R612B, R610B-HT, R610RB, R68RB-HT, R68WRB, R66WRB-HT |
| | RQ extension base | | RQ65B, RQ68B, RQ612B |
| | PLC CPU | | R00CPU, R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU, R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, R120ENCPU |
| | Process CPU | | R08PCPU, R16PCPU, R32PCPU, R120PCPU |
| | SIL2 process CPU | | R08PSFCPU, R16PSFCPU, R32PSFCPU, R120PSFCPU |
| | Safety CPU | | R08SFCPU, R16SFCPU, R32SFCPU, R120SFCPU |
| | C controller | | R12CCPU-V |
| | Motion CPU | | R16MTCPU, R32MTCPU, R64MTCPU |
| | MELSECWinCPU | | R102WCPU-W |
| | NCCPU | | R16NCCPU |
| | Robot CPU | | R16RTCPU |
| | Power supply | | R61P, R62P, R63P, R64P, R63RP, R64RP |
| | CPU extension | SIL2 function module | R6PSFM |
| | | Redundant function module | R6RFM |
| | | Safety function module | R6SFM |
| | | Ethernet interface module | _RJ71EN71(CCIEC), _RJ71EN71(CCIEF), _RJ71EN71(E+IEC), _RJ71EN71(E+IEF) |
| | Input | | RX10, RX28, RX40C7, RX40NC6H, RX40PC6H, RX41C4, RX41C6HS, RX42C4, RX61C6HS, RX70C4, RX71C4, RX72C4, RX40NC6B, RX40NC6S-TS |
| | Output | | RY10R2, RY20S6, RY18R2A, RY40NT5P, RY40PT5P, RY41NT2P, RY41NT2H, RY41PT1P, RY41PT2H, RY42NT2P, RY42PT1P, RY40PT5B, RY40PT5B-AS, RY48PT20S-TS |
| | I/O | | RH42C4NT2P |
| | NC dedicated module | | R173SXY |
| | Sensor control | | R60MH112, R60MH112-NA |
| | Analog input | | R60AD4, R60ADV8, R60ADI8, R60AD8-G, R60AD16-G, R60ADH4, R60ADI8-HA |
| | Analog output | | R60DA4, R60DAV8, R60DAI8, R60DA8-G, R60DA16-G, R60DAH4 |
| | Temperature input | | R60RD8-G, R60TD8-G |
| | Temperature control module | | R60TCTRT2TT2, R60TCTRT2TT2BW, R60TCRT4, R60TCRT4BW, R60TCTRT2TT2-TS, R60TCRT4-TS |
| | CC-Link IE TSN compatible motion module | | RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW, RD78G4(S), RD78G8(S), RD78G16(S) |
| | Simple motion | | RD77MS2, RD77MS4, RD77MS8, RD77MS16, RD77GF4, RD77GF8, RD77GF16, RD77GF32 |
| | Pulse I/O, Positioning | | RD62P2, RD62P2E, RD62D2, RD60P8-G, RD75P2, RD75P4, RD75D2, RD75D4, RD40PD01 |
| | Energy measuring module | | RE81WH |

| Series | Module type | | Module name |
|-------------|---|---|--|
| MELSEC iQ-R | Information module | C intelligent function module | RD55UP06-V, RD55UP12-V, RD55UP06-V(R), RD55UP12-V(R) |
| | | High speed data communication module | RD81DC96 |
| | | High speed data logger module | RD81DL96 |
| | | MES interface module | RD81MES96, RD81MES96N |
| | | OPC UA server module | RD81OPC96 |
| | | Recorder module | RD81RC96 |
| | | Camera recorder module | RD81RC96-CA |
| | | Serial communication module | RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | | Ethernet interface module | RJ71EN71(CCIEC), RJ71EN71(CCIEF), RJ71EN71(E+E), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF), RJ71EN71(Q) |
| | | GP-IB interface module | RJ71GB91(M), RJ71GB91(S) |
| | Network module | AnyWireASLINK master module | RJ51AW12AL |
| | | CC-Link system master/local module | RJ61BT11 |
| | | BACnet interface module | RJ71BAC96 |
| | | CANopen module | RJ71CN91 |
| | | DeviceNet master/slave module | RJ71DN91 |
| | | EtherNet/IP module | RJ71EIP91 |
| | | CC-Link IE Field Network module | RJ71GF11-T2, RJ71GF11-T2(MR), RJ71GF11-T2(SR), RJ71GF11-T2(LR) |
| | | CC-Link IE TSN module | RJ71GN11-T2, RJ71GN11-SX |
| | | CC-Link IE TSN Plus master/local module | RJ71GN11-EIP(T+E) |
| | | CC-Link IE Controller Network module | RJ71GP21-SX, RJ71GP21-SX(R), RJ71GP21S-SX, RJ71GP21S-SX(R) |
| | | MELSECNET/H network module | RJ71LP21-25, RJ71LP21-25(R), RJ71BR11 |
| | | PROFIBUS interface module | RJ71PB91V(S) |
| | Blank cover module | | RG60 |
| MELSEC iQ-L | PLC PCU | | L04HCPU, L08HCPU, L16HCPU, L32HCPU |
| | CPU extension | | _IO |
| | CC-Link IE TSN compatible motion module | | LD78G4(S), LD78G16(S) |

| Series | Module type | | Module name |
|-------------|---|----------------------------|---|
| MELSEC iQ-F | PLC CPU | | FX5U-32MR/DS, FX5U-32MR/ES, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/DS, FX5U-64MR/ES, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/DS, FX5U-80MR/ES, FX5U-80MT/DS, FX5U-80MT/DSS, FX5U-80MT/ES, FX5U-80MT/ESS, FX5UC-32MR/DS-TS, FX5UC-32MT/D, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS, FX5UC-32MT/DSS-TS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS, FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, FX5UJ-60MT/ESS, FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, FX5UJ-60MT/DSS, FX5S-30MR/DS, FX5S-30MR/ES, FX5S-30MT/DS, FX5S-30MT/DSS, FX5S-30MT/ES, FX5S-30MT/ESS, FX5S-40MR/DS, FX5S-40MR/ES, FX5S-40MT/DS, FX5S-40MT/DSS, FX5S-40MT/ES, FX5S-40MT/ESS, FX5S-60MR/DS, FX5S-60MR/ES, FX5S-60MT/DS, FX5S-60MT/DSS, FX5S-60MT/ES, FX5S-60MT/ESS, FX5S-80MR/DS, FX5S-80MR/ES, FX5S-80MT/DS, FX5S-80MT/DSS, FX5S-80MT/ES, FX5S-80MT/ESS |
| | Input | Terminal type | FX5-8EX/ES, FX5-16EX/ES |
| | | Connector type | FX5-C16EX/D, FX5-C16EX/DS, FX5-C32EX/D, FX5-C32EX/DS |
| | | Spring clamp terminal type | FX5-C32EX/DS-TS |
| | Output | Terminal type | FX5-8EYR/ES, FX5-8EYT/ES, FX5-8EYT/ESS, FX5-16EYR/ES, FX5-16EYT/ES, FX5-16EYT/ESS |
| | | Connector type | FX5-C16EYT/D, FX5-C16EYT/DSS, FX5-C32EYT/D, FX5-C32EYT/DSS |
| | | Spring clamp terminal type | FX5-C16EYR/D-TS, FX5-C32EYT/D-TS, FX5-C32EYT/DSS-TS |
| | I/O | Terminal type | FX5-16ER/ES, FX5-16ET/ES, FX5-16ET/ESS, FX5-32ER/ES, FX5-32ET/ES, FX5-32ET/ESS, FX5-32ER/DS, FX5-32ET/DS, FX5-32ET/DSS, FX5-16ET/ES-H, FX5-16ET/ESS-H |
| | | Connector type | FX5-C32ET/D, FX5-C32ET/DSS |
| | | Spring clamp terminal type | FX5-C32ET/DS-TS, FX5-C32ET/DSS-TS |
| | Analog input | | FX5-4AD |
| | Analog output | | FX5-4DA |
| | Multiple input | | FX5-8AD |
| | Temperature control module | | FX5-4LC |
| | Pulse I/O, Positioning | | FX5-20PG-D, FX5-20PG-P, FX5-2HC/ES |
| | CC-Link IE TSN compatible motion module | | FX5-40SSC-G(S), FX5-80SSC-G(S) |
| | Simple motion | | FX5-40SSC-S, FX5-80SSC-S |
| | Information module | | FX5-ENET, FX5-ENET/IP |
| | Network module | | FX5-CCLGN-MS, FX5-CCLIEF, FX5-CCL-MS, FX5-ASL-M, FX5-DP-M |
| | Safety extension module | | FX5-SF-MU4T5, FX5-SF-8DI4 |
| | Extension power supply module | Terminal type | FX5-1PSU-5V |
| | | Connector type | FX5-C1PS-5V |
| | Connector conversion module | | FX5-CNV-IF |
| | FX5/FX bus conversion module | | FX5-CNV-BUS, FX5-CNV-BUSC |

| Series | Module type | | Module name |
|----------|----------------------------|-----------------------------------|---|
| MELSEC-Q | Input | | QX28, QX10(-TS), QX40(-TS), QX80(-TS), QX70, QX50, QX41(-S2), QX81(-S2), QX71, QX42, QX72, QX82, QX40-S1, QX40H(NoiseF_OFF), QX40H(NoiseF_ON), QX70H(NoiseF_OFF), QX70H(NoiseF_ON), QX80H(NoiseF_OFF), QX80H(NoiseF_ON), QX90H(NoiseF_OFF), QX90H(NoiseF_ON), QX41-S1, QX11L(QX21L), QX42-S1, QX82-S1 |
| | Output | | QY10(-TS), QY40P(-TS), QY50, QY80(-TS), QY18A, QY22, QY68A, QY70, QY11AL, QY41P, QY81P, QY71, QY13L, QY23L, QY51PL, QY41H, QY42P, QY82P |
| | I/O | | QX48Y57, QH42P, QX41Y41P |
| | Interrupt input | | QI60 |
| | Analog input | | Q64AD, Q68ADV, Q68ADI, Q64AD-GH, Q62AD-DGH, Q68AD-G, Q66AD-DG, Q64ADH, Q61LD, Q68CT |
| | Analog output | | Q62DA, Q62DAN, Q64DA, Q64DAN, Q68DAV, Q68DAVN, Q68DAI, Q68DAIN, Q62DA-FG, Q66DA-G, Q64DAH |
| | Analog I/O | | Q64AD2DA |
| | Temperature input | | Q64RD, Q64RD-G, Q68RD3-G, Q64TD, Q64TDV-GH, Q68TD-G-H01, Q68TD-G-H02 |
| | Temperature control module | | Q64TCTT, Q64TCTTN, Q64TCTTBW, Q64TCTTBWN, Q64TCRT, Q64TCRTN, Q64TCRTBW, Q64TCRTBWN |
| | Loop control | | Q62HLC |
| | Pulse I/O, Positioning | | QD70D4, QD70D8, QD72P3C3, QD73A1, QD63P6, QD64D2, QD65PD2, QD60P8-G |
| | Energy measuring module | | QE81WH, QE81WH4W, QE82LG, QE83WH4W, QE84WH |
| | Information module | Intelligent communications module | QD51, QD51-R24 |
| | | MES interface module | QJ71MES96, QJ71MES96N |
| | | Web server module | QJ71WS96 |
| | Network module | AnyWireASLINK master module | QJ51AW12AL |
| | | CC-Link/LT master module | QJ61CL12 |
| | | AS-i master module | QJ71AS92 |
| | | MELSECNET/H network module | QJ71BR11, QJ71LP21(-25 S-25 G GE), QJ71NT11B |
| | | DeviceNet master/slave module | QJ71DN91 |
| | | FL-net (OPCN-2) interface module | QJ71FL71(-T -B5)(-F01), QJ71FL71-B2(-F01) |
| | | MODBUS(R) interface module | QJ71MT91, QJ71MB91 |
| | Blank cover module | | QG60 |
| | Partner products | | — |

| Series | Module type | | Module name |
|----------|----------------------------|--|--|
| MELSEC-L | Input | | LX28, LX10, LX40C6, LX41C4, LX42C4 |
| | Output | | LY18R2A, LY28S1A, LY10R2, LY20S6, LY40NT5P, LY40PT5P, LY41NT1P, LY41PT1P, LY42NT1P, LY42PT1P |
| | I/O | | LH42C4NT1P, LH42C4PT1P |
| | Analog input | | L60AD4, L60AD4-2GH, L60ADVL8, L60ADIL8 |
| | Analog output | | L60DA4, L60DAVL8, L60DAIL8 |
| | Analog I/O | | L60AD2DA2 |
| | Temperature input | | L60RD8 |
| | Temperature control module | | L60TCTT4, L60TCTT4BW, L60TCRT4, L60TCRT4BW |
| | Multiple input | | L60MD4-G |
| | Pulse I/O, Positioning | | LD75D1, LD75D2, LD75D4, LD75P1, LD75P2, LD75P4, LD62, LD62D, LD40PD01 |
| | Information module | Serial communication module | LJ71C24, LJ71C24-R2 |
| | | Ethernet interface module | LJ71E71-100 |
| | Network module | AnyWireASLINK master module | LJ51AW12AL |
| | | CC-Link system master/local module | LJ61BT11 |
| | | CC-Link IE Field Network master/local module | LJ71GF11-T2 |

Modules supported by GX Simulator3 (System simulation)

The following table shows modules that can be simulated interacting with other modules and the maximum number of the modules.

| Series | Module type | | Module name | Maximum number of modules (in all systems) |
|--------------------------------------|---|--|---|--|
| MELSEC iQ-R | PLC CPU | | R00CPU, R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU, R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, R120ENCPU | 4 ^{*1} |
| | Process CPU | | R08PCPU, R16PCPU, R32PCPU, R120PCPU | |
| | SIL2 process CPU | | R08PSFCPU, R16PSFCPU, R32PSFCPU, R120PSFCPU | |
| | Safety CPU | | R08SFCPU, R16SFCPU, R32SFCPU, R120SFCPU | |
| | Simple motion | | RD77MS2, RD77MS4, RD77MS8, RD77MS16 | 6 ^{*2} |
| | | | RD77GF4, RD77GF8, RD77GF16, RD77GF32 | 2 ^{*3} |
| | Motion CPU | | R16MTCPU, R32MTCPU, R64MTCPU | |
| | CC-Link IE TSN compatible motion module | | RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW | |
| | | | RD78G4(S), RD78G8(S), RD78G16(S) | |
| | CPU extension | Ethernet interface module | _RJ71EN71(CCIEC), _RJ71EN71(CCIEF), _RJ71EN71(E+IEC), _RJ71EN71(E+IEF) | 4 ^{*4} |
| | Information module | Ethernet interface module | RJ71EN71(CCIEC), RJ71EN71(CCIEF), RJ71EN71(E+CCIEC), RJ71EN71(E+CCIEF) | 4 ^{*4} (2 per system) |
| | Network module | CC-Link IE Field Network module | RJ71GF11-T2, RJ71GF11-T2(MR), RJ71GF11-T2(SR), RJ71GF11-T2(LR) | |
| CC-Link IE TSN module | | RJ71GN11-T2 | | |
| CC-Link IE Controller Network module | | RJ71GP21-SX, RJ71GP21-SX(R), RJ71GP21S-SX, RJ71GP21S-SX(R) | | |
| MELSEC iQ-L | PLC CPU | | L04HCPU, L08HCPU, L16HCPU, L32HCPU | 4 ^{*1} |
| MELSEC iQ-F | PLC CPU | | FX5U-32MR/DS, FX5U-32MR/ES, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/DS, FX5U-64MR/ES, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/DS, FX5U-80MR/ES, FX5U-80MT/DS, FX5U-80MT/DSS, FX5U-80MT/ES, FX5U-80MT/ESS, FX5UC-32MR/DS-TS, FX5UC-32MT/D, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS, FX5UC-32MT/DSS-TS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS, FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, FX5UJ-60MT/ESS, FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, FX5UJ-60MT/DSS, FX5S-30MR/DS, FX5S-30MR/ES, FX5S-30MT/DS, FX5S-30MT/DSS, FX5S-30MT/ES, FX5S-30MT/ESS, FX5S-40MR/DS, FX5S-40MR/ES, FX5S-40MT/DS, FX5S-40MT/DSS, FX5S-40MT/ES, FX5S-40MT/ESS, FX5S-60MR/DS, FX5S-60MR/ES, FX5S-60MT/DS, FX5S-60MT/DSS, FX5S-60MT/ES, FX5S-60MT/ESS, FX5S-80MR/DS, FX5S-80MR/ES, FX5S-80MT/DS, FX5S-80MT/DSS, FX5S-80MT/ES, FX5S-80MT/ESS | |
| | Simple motion | | FX5-40SSC-S, FX5-80SSC-S | 6 ^{*2} |
| | CC-Link IE TSN compatible motion module | | FX5-40SSC-G(S), FX5-80SSC-G(S) | 2 ^{*3} |
| | Network module | | FX5-CCLGN-MS, FX5-CCLIEF | 4 ^{*4} (2 per system) |

*1 The sum of all CPU modules

*2 The sum of all the following modules:

· Simple motion modules (RD77MS2, RD77MS4, RD77MS8, RD77MS16, FX5-40SSC-S, and FX5-80SSC-S)

*3 The sum of all the following modules:

· Simple motion modules (RD77GF4, RD77GF8, RD77GF16, and RD77GF32)

- Motion CPU
- CC-Link IE TSN compatible motion module

*4 The sum of all Ethernet interface modules and network modules

■Modules supported by SMM Simulator

| Series | Module type | Model name |
|-------------|---------------|-------------|
| MELSEC iQ-R | Simple motion | RD77MS2 |
| | | RD77MS4 |
| | | RD77MS8 |
| | | RD77MS16 |
| | | RD77GF4 |
| | | RD77GF8 |
| | | RD77GF16 |
| | | RD77GF32 |
| MELSEC iQ-F | Simple motion | FX5-40SSC-S |
| | | FX5-80SSC-S |

■Modules supported by MU Simulator

| Series | Module Type | Model Name |
|-------------|---|----------------|
| MELSEC iQ-R | CC-Link IE TSN compatible motion module | RD78G4 |
| | | RD78G8 |
| | | RD78G16 |
| | | RD78G32 |
| | | RD78G64 |
| | | RD78GHV |
| | | RD78GHW |
| | | RD78G4(S) |
| | | RD78G8(S) |
| | | RD78G16(S) |
| MELSEC iQ-F | CC-Link IE TSN compatible motion module | FX5-40SSC-G(S) |
| | | FX5-80SSC-G(S) |

■Modules supported by MT Simulator2

| Series | Module type | Model name |
|-------------|-------------|------------|
| MELSEC iQ-R | Motion CPU | R16MTCPU |
| | | R32MTCPU |
| | | R64MTCPU |

Firmware versions of CPU modules

GX Simulator3 runs based on the following firmware versions. When the firmware version of a CPU module is not matched with the following one, operation of the actual module and GX Simulator3 may differ.

| Module type | Supported version of GX Works3 | Firmware version |
|--|--------------------------------|------------------|
| RnCPU (R00CPU, R01CPU, R02CPU) | Version 1.045X or later | 01 |
| | Version 1.050C or later | 05 |
| | Version 1.055H or later | 08 |
| | Version 1.060N or later | 12 |
| | Version 1.065T or later | 15 |
| | Version 1.070Y or later | 18 |
| | Version 1.075D or later | 21 |
| | Version 1.080J or later | 24 |
| | Version 1.085P or later | 26 |
| | Version 1.090U or later | 30 |
| | Version 1.105K or later | 37 |
| | Version 1.110Q or later | 38 |
| RnCPU (R04CPU, R08CPU, R16CPU, R32CPU, R120CPU) | Version 1.007H or later | 03 |
| | Version 1.020W or later | 13 |
| | Version 1.025B or later | 17 |
| | Version 1.030G or later | 22 |
| | Version 1.035M or later | 26 |
| | Version 1.040S or later | 28 |
| | Version 1.045X or later | 31 |
| | Version 1.050C or later | 35 |
| | Version 1.055H or later | 40 |
| | Version 1.060N or later | 44 |
| | Version 1.065T or later | 47 |
| | Version 1.070Y or later | 50 |
| | Version 1.075D or later | 53 |
| | Version 1.080J or later | 57 |
| | Version 1.085P or later | 59 |
| | Version 1.090U or later | 63 |
| | Version 1.105K or later | 70 |
| | Version 1.110Q or later | 71 |
| RnENCPU | Version 1.020W or later | 13 |
| | Version 1.025B or later | 17 |
| | Version 1.030G or later | 22 |
| | Version 1.035M or later | 26 |
| | Version 1.040S or later | 28 |
| | Version 1.045X or later | 31 |
| | Version 1.050C or later | 35 |
| | Version 1.055H or later | 40 |
| | Version 1.060N or later | 44 |
| | Version 1.065T or later | 47 |
| | Version 1.070Y or later | 50 |
| | Version 1.075D or later | 53 |
| | Version 1.080J or later | 57 |
| | Version 1.085P or later | 59 |
| | Version 1.090U or later | 63 |
| | Version 1.105K or later | 70 |
| | Version 1.110Q or later | 71 |

| Module type | Supported version of GX Works3 | Firmware version |
|-------------|--------------------------------|------------------|
| RnPCPU | Version 1.010L or later | 01 |
| | Version 1.020W or later | 02 |
| | Version 1.025B or later | 03 |
| | Version 1.030G or later | 05 |
| | Version 1.035M or later | 08 |
| | Version 1.040S or later | 10 |
| | Version 1.045X or later | 13 |
| | Version 1.050C or later | 16 |
| | Version 1.055H or later | 18 |
| | Version 1.060N or later | 20 |
| | Version 1.065T or later | 22 |
| | Version 1.070Y or later | 24 |
| | Version 1.075D or later | 25 |
| | Version 1.080J or later | 27 |
| | Version 1.085P or later | 29 |
| | Version 1.090U or later | 33 |
| | Version 1.105K or later | 39 |
| | Version 1.110Q or later | 42 |
| RnSFCPU | Version 1.020W or later | 03 |
| | Version 1.030G or later | 06 |
| | Version 1.035M or later | 07 |
| | Version 1.040S or later | 08 |
| | Version 1.045X or later | 10 |
| | Version 1.050C or later | 13 |
| | Version 1.055H or later | 16 |
| | Version 1.060N or later | 17 |
| | Version 1.065T or later | 19 |
| | Version 1.070Y or later | 21 |
| | Version 1.075D or later | 23 |
| | Version 1.080J or later | 24 |
| | Version 1.085P or later | 26 |
| | Version 1.105K or later | 32 |
| | Version 1.110Q or later | 33 |
| RnPSFCPU | Version 1.045X or later | 01 |
| | Version 1.060N or later | 03 |
| | Version 1.065T or later | 04 |
| | Version 1.085P or later | 08 |
| | Version 1.090U or later | 09 |
| | Version 1.105K or later | 11 |
| | Version 1.110Q or later | 12 |
| LHCPU | Version 1.065T or later | 01 |
| | Version 1.080J or later | 02 |
| | Version 1.085P or later | 04 |
| | Version 1.105K or later | 07 |

| Module type | Supported version of GX Works3 | Firmware version |
|-------------------|--------------------------------|------------------|
| FX5UCPU, FX5UCCPU | Version 1.025B or later | 1.015 |
| | Version 1.030G or later | 1.031 |
| | Version 1.035M or later | 1.040 |
| | Version 1.040S or later | 1.050 |
| | Version 1.045X or later | 1.060 |
| | Version 1.050C or later | 1.065 |
| | Version 1.055H or later | 1.110 |
| | Version 1.065T or later | 1.201 |
| | Version 1.070Y or later | 1.210 |
| | Version 1.075D or later | 1.220 |
| | Version 1.080J or later | 1.240 |
| | Version 1.085P or later | 1.260 |
| | Version 1.090U or later | 1.270 |
| | Version 1.105K or later | 1.300 |
| | Version 1.110Q or later | 1.310 |
| FX5UJCPU | Version 1.065T or later | 1.000 |
| | Version 1.080J or later | 1.010 |
| | Version 1.085P or later | 1.020 |
| | Version 1.090U or later | 1.030 |
| | Version 1.105K or later | 1.060 |
| | Version 1.110Q or later | 1.070 |
| FX5SCPU | Version 1.085P or later | 1.000 |
| | Version 1.105K or later | 1.020 |
| | Version 1.110Q or later | 1.030 |

Firmware versions of network modules

GX Simulator3 operates based on the firmware with the following version.

| Network module | Supported version of GX Works3 | Firmware version |
|------------------------|--------------------------------|------------------|
| RnENCPU (network part) | Version 1.040S or later | 18 |
| | Version 1.060N or later | 39 |
| | Version 1.080J or later | 54 |
| RJ71EN71 | Version 1.040S or later | 18 |
| | Version 1.060N or later | 39 |
| | Version 1.080J or later | 54 |
| RJ71GP21-SX | Version 1.040S or later | 18 |
| | Version 1.060N or later | 39 |
| | Version 1.080J or later | 54 |
| RJ71GP21S-SX | Version 1.050C or later | 18 |
| | Version 1.060N or later | 39 |
| | Version 1.080J or later | 54 |
| RJ71GF11-T2 | Version 1.040S or later | 18 |
| | Version 1.060N or later | 39 |
| | Version 1.080J or later | 54 |
| RJ71GN11-T2 | Version 1.060N or later | 01 |
| | Version 1.080J or later | 12 |
| FX5-CCLIEF | Version 1.040S or later | 1.004 |
| | Version 1.080J or later | 1.005 |
| FX5-CCLGN-MS | Version 1.080J or later | 1.001 |

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Supported CPU module functions

The simulation function of GX Works3 does not support some functions of a CPU module.

The following shows the functions which are supported by the simulation function.

For details on each function, refer to the following:


📖 MELSEC iQ-R CPU Module User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (Application)

CPU module (RnCPU, RnENCPU, RnPCPU, LHCPU)

| Function name | | | | Remarks | | |
|--------------------------|--|---|---|--|---|---|
| Basic | Program | Program execution (ladder, ST, and FBD/LD) | | Page 1038 Program execution time | | |
| | | Program execution (SFC) | | | | |
| | | Scan time monitoring time (WDT) setting | | Page 1040 Watchdog timer Page 1038 Program execution time | | |
| | Clock | Clock | Clock | | The clock data is written to the internal time of a simulator. It differs from the time of a personal computer. | |
| | | | Time zone setting | | | The clock of a personal computer is copied to the internal time and used. |
| | | | Daylight saving time* ¹ | | | |
| | | System clock | | — | | |
| | | LED display | | | | |
| | Writing to PLC/reading from PLC | Writing data to a programmable controller (including data writing while a CPU module is in RUN) | | | | |
| | | Reading from a programmable controller (including data reading while a CPU module is in RUN) | | | | |
| | Diagnostics | Self-diagnostics | Error detection | | Page 1042 Errors for the self-diagnostics function | |
| | | | Module diagnostics | | This function is available only for the host station. | |
| | Monitor and test | Basic monitor | Monitoring a program (circuit monitor) | | — | |
| | | Test | Testing device and label data (changing values) | Testing device and label data (changing values) | | |
| | | | | Testing local device and local label data | | |
| | Debug | Online change | Online change (ladder block) | | | |
| | | Program restoration information write selection* ² | | | | |
| System operation setting | LED control setting for program restoration information write status* ^{2,3} | | | | | |
| | File batch online change operation setting* ^{3,4} | | | | | |

| Function name | | | | Remarks |
|---|---|--|--|---|
| Operation | Program | Program execution setting | Program execution type setting | — |
| | | | Device/file usage setting | A virtual SD memory card file can be used. |
| | | Interrupt | Fixed scan interval setting | Page 1038 Program execution time |
| | | | File register block number saving/ recovering setting | — |
| | | | Interrupt priority setting from module*4 | |
| | | | Interrupt enable setting in executing instruction*4 | |
| | | | PID control | |
| | | Process control*5 | | |
| | | Constant scan | | Page 1038 Program execution time |
| | Database*1*3 | | | Page 1045 Database |
| | Operation | Remote operation | Operation change | — |
| | | | Latch clear | |
| | | | RUN-PAUSE contact setting | |
| | Device/data | Device/label memory area setting | Device/label memory area setting | |
| | | | Local device setting | |
| | | Link direct device setting | | |
| | | Refresh memory setting*1 | | |
| | | Internal buffer capacity setting*6 | | |
| | | Index register setting | | |
| | | Initial device/label value setting | | |
| | | Label initial value reflection setting*5 | | |
| | | Label initialization function after converting all programs and writing to a programmable controller*5 | | |
| | | Device comment | | |
| | | File register setting | | |
| | | Timer device limit setting | | |
| | | STOP→RUN operation setting of output (Y) | | |
| | | Label access setting from external devices*3 | | |
| Write-protect for device data (from outside the CPU module)*7 | | | | |
| System clock (SM400 to SM403) every end update setting*7 | | | | |
| SD memory card*6 | Writing to an SD memory card/reading from an SD memory card | | | |
| | SD memory card forcibly disabled | | | |
| Latch | | | This function is not available while GX Simulator3 is stopped. | |
| Communication setting | Device/label access service processing setting | | — | |
| | Device/label access service processing constant wait*5 | | | |
| RAS | Diagnostics | Error clear | | |
| | | FB hierarchy information*4 | | |
| | System monitoring information (SD2000 to SD2036)*7 | | | The MAC address and firmware hash value cannot be used. |
| | History | Event history (Error history/module error history collecting) | — | This function is available only for the host station. A virtual SD memory card file can be used.*6 |
| | | | Event history logging restriction*4 | |

| Function name | | | | Remarks | |
|--------------------------------|---|---|--|----------------------------------|--|
| Maintenance | Monitor | (Interrupt) program list monitor | Program start/stop ^{*4} | Page 1038 Program execution time | |
| | | Scan time monitor | | | |
| | | Scan time measurement ^{*7} | | | |
| | | Scan time clear ^{*7} | | — | |
| | | SFC program (diagram) monitor | SFC-activated step monitor ^{*1} | | |
| | | (Local) device/label batch/registration monitor | | | |
| | | Buffer memory monitor | | | |
| | | Real-time monitor ^{*1} | | Page 1038 Program execution time | |
| | | Specified program monitor ^{*7} | | — | |
| | | Test | Device test with execution conditions | | |
| | External input/output forced on/off | | | | |
| | Clearing device, label and file register | | | | |
| | Clearing a latch device and label | | | | |
| | Debug | Change of TC setting value ^{*4} | | | |
| | | Online change (SFC block) | Inactive block | | |
| | | | Active block | | |
| | Memory dump ^{*1*6} | | | | |
| | Multiple CPU system ^{*2*4} | Operation setting | Other PLC control module setting | Control CPU setting | These functions are available only for CPUs that are simulated in the system simulation. |
| | | | | Importing I/O from outside group | |
| Operation mode setting | | | Clock data synchronization | | |
| | | | Operation setting at stop error | | |
| | | Multiple CPU synchronous startup setting | | | |
| CPU data communication | | Communication | Fixed scan communication setting | | |
| | | | CPU number-based data assurance | | |
| | | | Communication by refresh | | |
| | | | Communication by direct access | | |
| Interrupt | | Multiple CPU synchronization interruption (I45) | | | |
| Redundant system ^{*8} |  Page 543 Simulation of an RnPCPU (redundant mode) | | | | |

*1 RnPCPUs do not support it.

*2 RnPCPUs (redundant mode) do not support it.

*3 An R00CPU, R01CPU, and R02CPU do not support it.

*4 LHCPUs do not support it.

*5 Only RnPCPUs support it.

*6 R00CPU do not support it.

*7 RnCPUs and RnENCPUs support it.

*8 Only RnPCPUs (redundant mode) support it.

CPU module (RnPSFCPU, RnSFCPU)

| Function name | | | | | Remarks | |
|--|--|--|---|--------------------------------|--|---|
| Basic | Program | Program execution (ladder, ST, and FBD/LD) | | Standard program | Page 1038 Program execution time | |
| | | | | Safety program | | |
| | | Program execution (SFC)* ¹ | | Standard program | Page 1040 Watchdog timer Page 1038 Program execution time | |
| | | Scan time monitoring time (WDT) setting | | Standard program | | |
| | | | | Safety program | | |
| | Clock | Clock | Clock | | The clock data is written to the internal time of a simulator. It differs from the time of a personal computer. | |
| | | | Time zone | | | The clock of a personal computer is copied to the internal time and used. |
| | | System clock | System clock | | — | |
| | | | Safety special relay/safety special register | | | |
| | | Writing to PLC/reading from PLC | Writing data to a programmable controller (including data writing while a CPU module is in RUN) | | Standard program | |
| | | | | | Safety program | |
| | Reading from a programmable controller (including data reading while a CPU module is in RUN) | | Standard program | | | |
| | | | Safety program | | | |
| | Diagnostics | Self-diagnostics | Error detection | | This function is available only for the host station. | |
| | | | Module diagnostics | | | |
| | Monitor and test | Monitoring a program (circuit monitor) | | Standard program | — | |
| | | | | Safety program | | |
| | | Testing device and label data (changing values) | Testing device and label data (changing values) | Standard device/standard label | | |
| | | | | Safety device/safety label | | |
| | | | | Standard/safety shared label | | |
| | | Testing local device and local label data | Testing local device and local label data | Standard device/standard label | | |
| | | | | Safety device/safety label | | |
| | | | | Standard/safety shared label | | |
| | | Debug | Online change | Online change (ladder block) | | Standard program |
| | Safety program* ¹ | | | | | |
| | Program restoration information write selection* ¹ | | | | | |
| | System operation setting* ¹ | LED control setting for program restoration information write status | | | | |
| File batch online change operation setting | | | | | | |

| Function name | | | | | Remarks |
|---------------|---------|---------------------------|--|------------------|----------------------------------|
| Operation | Program | Program execution setting | Program execution type setting | Standard program | — |
| | | | | Safety program | |
| | | | Device/file usage setting | Standard program | |
| | | | | Safety program | |
| | | Interrupt | Fixed scan interval setting | Standard program | Page 1038 Program execution time |
| | | | File register block number saving/recovering setting | Standard program | — |
| | | | Interrupt priority setting from module | Standard program | |
| | | | Interrupt enable setting in executing instruction | Standard program | |
| | | | PID control | | Standard program |
| | | | Process control* ² | | Standard program |
| | | | Constant scan | | |
| | | | | | Page 1038 Program execution time |

| Function name | | | | | Remarks | | | |
|---------------|----------------------------------|---|---|---|--|----------------------|---|--|
| Operation | Operation | Remote operation | Operation change | | — | | | |
| | | | Latch clear | Standard device/ standard label | | | | |
| | | | RUN-PAUSE contact setting | | | | | |
| Device/data | Device/label memory area setting | Device/label memory area setting | Standard device/ standard label | Safety device/ safety label | Standard/safety shared label | | | |
| | | | | | | Local device setting | Standard program (Standard device/ standard label) | Safety program (Safety device/ safety label) |
| | | | | | | | Link direct device setting*1 | |
| | | Refresh memory setting | | | | | | |
| | | Internal buffer capacity setting | | | | | | |
| | | Index register setting | | Standard program | | | | |
| | | Initial device/label value setting | | Standard device/ standard label | | | | |
| | | Label initial value reflection setting*2 | | Standard label | | | | |
| | | Label initialization after converting all programs (reassignment)*2 | | Standard label | | | | |
| | | Device comment | | Standard device | | | | |
| | | | | Safety device | | | | |
| | | File register setting | | Standard program | | | | |
| | | Timer device limit setting | | Standard program | | | | |
| | | | | Safety program | | | | |
| | | STOP→RUN operation setting of output (Y) | | | | | | |
| | | Label access setting from external devices | | Standard label | | | | |
| | | Write-protect for device data (from outside the CPU module)*1 | | Standard program | | | | |
| | | Latch | Latch | Standard device/ standard label | This function is not available while GX Simulator3 is stopped. | | | |
| | | SD memory card | Writing to an SD memory card/reading from an SD memory card | | | — | | |
| | | | SD memory card forcibly disabled | | | | | |
| | | Communication setting | Device/label access service processing setting | | | | | |
| | | Diagnostics and history | Diagnostics | Error clear | | | | |
| | | | History | Event history (error history/module error history collecting) | — | | This function is available only for the host station. A virtual SD memory card file can be used. | |
| | | | | | Event history logging restriction*1 | | | |

| Function name | | | | Remarks | |
|---|--------------------------------------|--|--|--|------------------------------------|
| Maintenance | Monitor | (Interrupt) program list monitor | | Page 1038 Program execution time | |
| | | Scan time monitor | | | |
| | | Scan time measurement ^{*1} | | | |
| | | Scan time clear ^{*1} | | — | |
| | | SFC program (diagram) monitor ^{*1} | SFC-activated step monitor | | |
| | | (Local) device batch/registration monitor | | | |
| | | Buffer memory monitor | | | |
| | | Specified program monitor ^{*1} | | | |
| | Test | Device test with execution condition ^{*1} | | | Standard device/ standard label |
| | | External input/output forced on/off ^{*1} | | | |
| | | Clearing device, label and file register | | Standard device/ standard label | |
| | | | | Safety device/ safety label | |
| | | | | Standard/safety shared label | |
| | | Clearing a latch device and label | | | |
| | Debug | Change TC setting ^{*1} | | | |
| | | Online change (SFC block) ^{*1} | | Inactive block | |
| | | | | Active block | |
| | | Memory dump ^{*1} | | Standard device | |
| Multiple CPU system ^{*1} | Operation setting | Other PLC control module setting | Control CPU setting | These functions are available only for CPUs that are simulated in the system simulation. | |
| | | | Importing I/O from outside group | | |
| | | Operation mode setting | Clock data synchronization | | |
| | | | Operation setting at stop error | | |
| | | | Multiple CPU synchronous startup setting | | |
| | CPU data communication | Communication | Fixed scan communication setting | | |
| | | | CPU number-based data assurance | | |
| | | | Communication by refresh | | |
| | | | Communication by direct access | | |
| | Interrupt | Multiple CPU synchronization interruption (I45) | | | |
| Safety (RnSFCPU + R6SFM) (RnPSFCPU + R6PSFM) | Safety communication | CC-Link IE Field Network (safety communication function) | Safety refresh monitoring time | — | |
| | | | Safety data transfer device setting | | |
| | | | Safety protocol version ^{*1} | | |
| | | CC-Link IE TSN (safety communication function) ^{*1} | Safety refresh monitoring time | | |
| | | | Safety data transfer device setting | | |
| | Safety condition control | Safety/test mode | | | |
| Redundant system ^{*2} | 📖 Page 543 Simulation of an RnPSFCPU | | | | |

^{*1} Only RnSFCPU support it.

^{*2} Only RnPSFCPU support it.

MELSEC iQ-R and MELSEC iQ-L series common functions

| Function name | | | | Remarks |
|--------------------------------|----------------------------------|---|---|--|
| System configuration | System configuration setting | I/O assignment setting | | — |
| | | MELSEC iQ-R series 2-slots module | | |
| Program | Operation setting | MELSEC iQ-R series module (all modules) | Network parameter (CC-Link, CC-Link IE Control, CC-Link IE Field, CC-Link IE TSN, Ethernet) | |
| | | MELSEC iQ-L series module | Network parameter (CC-Link IE TSN) | |
| | Data communication | Refresh (I/O, network, buffer memory (intelligent function module)) | | Access with module FB (dedicated instruction) and module label is available. This function is not available in a safety program. |
| | | Direct access (U□\G, J□\X, J□\Y, J□\B, J□\SB, J□\W, J□\SW) | | |
| | Program | Interrupt from module*1 | | This function is available only for MELSEC iQ-R series simple motion modules. |
| | | Module dedicated instruction | | Page 1017 Module dedicated instruction Page 1037 Dedicated instructions for network modules |
| | Program creation support | Module label and module FB (device comment) auto-creation | | — |
| | | Sample program display (template display)*1 | | |
| | | Parameter auto-creation (initial setting and refresh setting) | | |
| | Label communication | Access from an external device | Label communication from GOT*2 | |
| Inter-module synchronization*3 | Inter-module synchronization | Fixed cycle synchronous control*4 | | — |
| | Interrupt | Inter-module synchronous interrupt (I44) | | |
| Security | File reading/writing restriction | File password*5 | | When a virtual SD memory card file to which a file with a password is copied is set in GX Simulator3, the copied file can be read from the virtual SD memory card file. (Password authentication is required.) |
| RAS | History | Event history | | A virtual SD memory card file can be used.*5 Among events that occur on a network, only the events for modules that are simulated in the system simulation can be checked. |
| | | | | |
| | Diagnostics | Module diagnostics | | This function is available only for the host station. These functions are available only for modules that are simulated in the system simulation. The operation test cannot be used. |
| | | CC-Link IE Controller Network diagnostics | | |
| | | CC-Link IE Field Network diagnostics | | |
| | | CC-Link IE TSN diagnostics*6 | | |

| Function name | | | Remarks |
|---------------|--|-----------------------------|---|
| Ethernet | Web server ^{*7} | Detailed module information | — |
| | | Device batch monitor | |
| | | Device test | |
| | | Watch | |
| | | CPU diagnostics | |
| | | Event history | |
| | | Access log | |
| | | User web page ^{*5} | |
| | | Display refreshing cycle | |
| | | Language switching | |
| | Simple CPU communication ^{*6} | | <p>This function is available when a module is simulated in the system simulation, and also any of the following options is selected for "Communication Destination" in "Simple CPU Communication Setting" of the module parameter:</p> <ul style="list-style-type: none"> • MELSEC iQ-R (built-in Ethernet) • MELSEC iQ-L (built-in Ethernet) • MELSEC iQ-F (built-in Ethernet) |

*1 LHCPUs do not support it.

*2 An R00CPU, R01CPU, and R02CPU do not support it.

*3 RnPCPUs (redundant mode), RnPSFCPUs, and LHCPUs do not support it.

*4 Not available for a CC-Link IE TSN module.

*5 An R00CPU does not support it.

*6 RnPSFCPUs do not support it.

*7 RnCPUs, RnENCPU, and RnPCPUs support it.

CPU module (FX5CPU)

| Function name | | Remarks |
|--|------------------------------|--|
| Scan time monitoring time (WDT) setting | | Page 1040 Watchdog timer Page 1038 Program execution time |
| Clock | | The clock data is written to the internal time of a simulator. It differs from the time of a personal computer. |
| Online change | Online change (ladder block) | — |
| Interrupt | Multiple interrupt | |
| Constant scan | | |
| Remote operation | Remote RUN/STOP | |
| | Remote PAUSE | |
| | Remote RESET | |
| Device/label memory area setting | | |
| Program capacity setting | | |
| Internal buffer capacity setting | | |
| Initial device value setting | | |
| Latch | | This function is not available while GX Simulator3 is stopped. |
| SD memory card | SD memory card forced stop | — |
| Device/label access service processing setting | | |
| Memory dump | | |
| Real-time monitor | | |
| RAS | Self-diagnostics | |
| | Error clear | |
| | Event history | |
| | | This function is available only for the host station. |

| Function name | | Remarks |
|---|-----------------------------|---|
| External input/output forced on/off | | — |
| PID control via instruction | | |
| PID control via parameter ^{*1} | | |
| SFC | | |
| Scan time clear | | |
| MELSOFT connection | | |
| Web server | Detailed module information | |
| | Device batch monitor | |
| | Device test | |
| | Watch | |
| | CPU diagnostics | |
| | Event history | |
| | Access log | |
| | User web page | |
| | Display refreshing cycle | |
| Language switching | | |
| Simple CPU communication | | Diagnostics functions are not available. For FX5UCPUs, FX5UCCPUs, and FX5UJCPUs, this function is available only when any of the following options is selected for "Communication Destination" in "Simple CPU Communication Setting" of the module parameter: <ul style="list-style-type: none">• MELSEC iQ-R (built-in Ethernet)• MELSEC iQ-L (built-in Ethernet)• MELSEC iQ-F (built-in Ethernet)^{*2} For FX5SCPUs, this function is available only when "MELSEC iQ-F (built-in Ethernet)" ^{*2} is selected for "Communication Destination" in "Simple CPU Communication Setting" of the module parameter. |

^{*1} FX5UCPUs and FX5UCCPUs support it.

^{*2} Only the modules supported by the simulation function are available.


A

Supported devices

The simulation function supports devices of CPU modules.

In addition, special relays and special registers that functions supported by the simulation function use are also supported.

For details on the devices, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

 MELSEC iQ-F FX5 User's Manual (Application)

Supported instructions

The instructions supported by the Simulation function are shown below:

For details on each instruction, refer to the following:

📖 MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

📖 MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks)

Note that no processing is performed for unsupported instructions (NOP processing).

RCPU and LHCPU

■Sequence instruction

| Classification | Symbol |
|------------------------------|---|
| Contact instruction | AND, ANDF, ANDFI, ANDP, ANDPI, ANI, LD, LDF, LDFI, LDI, LDP, LDPI, OR, ORF, ORFI, ORI, ORP, ORPI |
| Association instruction | ANB, EGF, EGP, INV, MEF, MEP, MPP, MPS, MRD, ORB |
| Output instruction | DELTA(P) ^{*1} , FF, OUT, OUT C, OUT F, OUT LC, OUT LT/LST, OUT T/ST, OUTH T/ST, PLF, PLS, RST, RST F, SET, SET F |
| Shift instruction | SFT(P) |
| Master control instruction | MC, MCR |
| Phase processing instruction | PHASE, PHASECHG, PHASEEND |
| Termination instruction | END, FEND |
| Stop instruction | STOP |
| No operation instruction | NOP |

*1 Intelligent function modules supporting GX Simulator3 (system simulation) support it.

■Basic instruction

| Classification | Symbol ^{*1} |
|----------------------------------|--|
| Comparison operation instruction | AND□(U), ANDD□(U), BKCOMP□(P)(U), CMP(P)(U) ^{*2} , DBKCOMP□(P)(U), DCMP(P)(U) ^{*2} , DZCP(P)(U) ^{*2} , LD□(U), LDD□(U), OR□(U), ORD□(U), ZCP(P)(U) ^{*2} |
| Arithmetic operation instruction | *(P)(U), +(P)(U), -(P)(U), /(P)(U), B*(P), B+(P), B-(P), B/(P), BK+(P)(U), BK-(P)(U), D*(P)(U), D+(P)(U), D-(P)(U), D/(P)(U), DB*(P), DB+(P), DB-(P), DB/(P), DBK+(P)(U), DBK-(P)(U), DDEC(P)(U), DEC(P)(U), DINC(P)(U), INC(P)(U) |
| Logical operation instruction | BKAND(P), BKOR(P), BKXNR(P), BKXOR(P), DAND(P), DOR(P), DXNR(P), DXOR(P), WAND(P), WOR(P), WXNR(P), WXOR(P) |
| Bit processing instruction | BKRST(P), BRST(P), BSET(P), DTEST(P), TEST(P) |
| Data conversion instruction | ASC2INT(P), BCD(P), BIN(P), BKBCD(P), BKBIN(P), BTOW(P), DABCD(P), DABIN(P)(U), DBCD(P), DBIN(P), DBL2DINT(P), DBL2INT(P), DBL2UDINT(P), DBL2UINT(P), DDABCD(P), DDABIN(P)(U), DECO(P), DGBIN(P)(U), DGRY(P)(U), DHABIN(P), DINT2INT(P), DINT2UDINT(P), DINT2UINT(P), DIS(P), DNEG(P), DVAL(P)(U), EMOD(P), ENCO(P), FLT2DINT(P), FLT2INT(P), FLT2UDINT(P), FLT2UINT(P), GBIN(P)(U), GRY(P)(U), HABIN(P), INT2DINT(P), INT2UDINT(P), INT2UINT(P), NDIS(P), NEG(P), NUNI(P), SEG(P), UDINT2DINT(P), UDINT2INT(P), UDINT2UINT(P), UINT2DINT(P), UINT2INT(P), UINT2UDINT(P), UNI(P), VAL(P)(U), WTOB(P) |
| Data shift instruction | BSFL(P), BSFR(P), EDSFTL(P) ^{*2} , EDSFTR(P) ^{*2} , ESFTL(P) ^{*2} , ESFTR(P) ^{*2} , DDSFR(P) ^{*2} , DDSFL(P) ^{*2} , DSFL(P), DSFR(P), DWSFTL(P) ^{*2} , DWSFTR(P) ^{*2} , ESFL(P) ^{*2} , ESFR(P) ^{*2} , EDSFR(P) ^{*2} , EDSFL(P) ^{*2} , SFL(P), SFR(P), SFTER(P) ^{*2} , SFTDWL(P) ^{*2} , SFTBL(P), SFTBR(P), SFTEDL(P) ^{*2} , SFTEDR(P) ^{*2} , SFTL(P) ^{*2} , SFTDWR(P) ^{*2} , SFTL(P) ^{*2} , SFTR(P) ^{*2} , SFTWL(P), SFTWR(P), WSFL(P) ^{*2} , WSFR(P) ^{*2} |
| Data transfer instruction | BLKMOV(P), BMOV(P), BMOVL(P), BXCH(P), CML(P), CMLB(P), DCML(P), DFMov(P), DFMovL(P), DMOV(P), DSWAP(P) ^{*2} , DXCH(P), FMOV(P), FMOVL(P), MOV(P), MOV(P), SMOV(P) ^{*2} , SWAP(P), XCH(P) |

*1 □ indicates an operator.

*2 RnCPUs, RnENCPUs, and LHCPUs support it.

■Application instruction

| Classification | Symbol ^{*1} |
|---------------------------------------|---|
| Program branch instruction | CJ, GOEND, JMP, SCJ |
| Program execution control instruction | DI, EI, IMASK, IRET, SIMASK, WDT(P) |
| Structure creation instruction | BREAK(P), CALL(P), ECALL(P), EFCALL(P), FCALL(P), FOR, NEXT, RET, XCALL |
| Program control instruction | POFF(P), PSCAN(P), PSTOP(P) |
| Rotation instruction | DRCL(P), DRCLR(P), DROL(P), DROR(P), RCL(P), RCR(P), ROL(P), ROR(P) |
| Data table operation instruction | FDEL(P), FIFR(P), FIFW(P), FINS(P), FPOP(P) |

| Classification | Symbol*1 |
|--|--|
| Reading/writing data instruction | S(P).DEVLD, SP.DEVST, SP.FREAD, SP.FWRITE |
| File operation instruction*2 | SP.FDELETE, SP.FCOPY, SP.FMOVE, SP.FRENAME, SP.FSTATUS |
| Data control instruction | BAND(P)(U), DBAND(P)(U), DLIMIT(P)(U), DSCL(P)(U), DSCL2(P)(U), DZONE(P)(U), LIMIT(P)(U), SCL(P)(U), SCL2(P)(U), ZONE(P)(U) |
| Data processing instruction | BON(P)*2, CRC(P)*2, DBON(P)*2, DMAX(P)(U), DMEAN(P)(U), DMIN(P)(U), DSERDATA(P), DSERMM(P)*2, DSORTD(U), DSORTTBL2(U)*2, DSQRT(P)*2, DSUM(P), DWSUM(P)(U), MAX(P)(U), MEAN(P)(U), MIN(P)(U), SERDATA(P), SERMM(P)*2, SORTD(U), SORTTBL(U)*2, SORTTBL2(U)*2, SQRT(P)*2, SUM(P), WSUM(P)(U) |
| Check code instruction | CCD(P) |
| Debugging and failure diagnostic instruction | LEDR, PALERT(P)*3, PABORT*3 |
| String processing instruction | \$+(P), \$MOV(P), \$MOV(P)_WS, AND\$□, BCDDA(P), BINDA(P)(U), BINHA(P), DBCDDA(P), DBINDA(P)(U), DBINHA(P), DSTR(P)(U), ESTR(P), INSTR(P), INT2ASC(P), LD\$□, LEFT(P), LEN(P), MIDR(P), MIDW(P), OR\$□, RIGHT(P), SJIS2WS(P), SJIS2WSB(P), STR(P)(U), STRDEL(P), STRINS(P), WS2SJIS(P) |
| Real number instruction | ACOS(P), ACOSD(P), ANDE□, ANDED□, ASIN(P), ASIND(P), ATAN(P), ATAND(P), BACOS(P), BASIN(P), BATAN(P), BCOS(P), BDSQRT(P), BSIN(P), BSQRT(P), BTAN(P), COS(P), COSD(P), DBL2FLT(P), DEG(P), DEGD(P), DINT2DBL(P), DINT2FLT(P), E*(P), E+(P), E-(P), E/(P), ECOMP(P)*2, ED*(P), ED+(P), ED-(P), ED/(P), EDCMP(P)*2, EDMAX(P), EDMIN(P), EDMOV(P), EDNEG(P), EDSQRT(P), EDZCP(P)*2, EMAX(P), EMIN(P), EMOV(P), ENEG(P), EREXP(P), ESQRT(P), EVAL(P), EXP(P), EXPD(P), EZCP(P)*2, FLT2DBL(P), INT2DBL(P), INT2FLT(P), LDE□, LDED□, LOG(P), LOG10(P), LOG10D(P), LOGD(P), ORE□, ORED□, POW(P), POWD(P), RAD(P), RADD(P), SIN(P), SIND(P), TAN(P), TAND(P), UDINT2DBL(P), UDINT2FLT(P), UINT2DBL(P), UINT2FLT(P) |
| Random number instruction | RND(P), SRND(P) |
| Index register instruction | ZPOP(P), ZPUSH(P) |
| File register operation instruction | QDRSET(P), RSET(P) |
| Read/write instruction for each 1 byte of a file register. | ZRRDB(P), ZRWRB(P) |
| Indirect address read instruction | ADRSET(P) |
| Special counter instruction | UDCNT1, UDCNT2 |
| Special timer instruction | STMR, TTMR |
| Pulse related instruction | PLSY, PWM, SPD |
| Shortcut control instruction | ROTC |
| Ramp signal instruction | RAMPQ |
| Matrix input instruction | MTR |
| Database access instruction | DBOPEN(P)*2, DBCLOSE(P)*2, DBINSERT(P)*2,*4, DBUPDATE(P)*2,*4, DBSELECT(P)*2,*4, DBDELETE(P)*2,*4, DBIMPORT(P)*2,*4, DBEXPORT(P)*2, DBTRANS(P)*2, DBCOMMIT(P)*2, DBROLBAK(P)*2 |
| Clock instruction | ANDDT□, ANDTM□, DATE+(P), DATE-(P), DATERD(P), DATEWR(P), DATE2SEC(P)(U), LDDT□, LDTM□, ORDT□, ORTM□, SEC2DATE(P)(U), S(P).DATE+, S(P).DATE-, S(P).DATERD, SEC2TIME(P), TCOMP(P)*2, TIME2SEC(P), TZCP(P)*2 |
| Timing check instruction | DHOURL*2, DUTY, HOURL*2, TIMCHK |
| Module access instruction | DFROM(P), DFROMD(P), DTO(P), DTOD(P), FROM(P), FROMD(P), TO(P), TOD(P), RFS(P), COM(P), S(P).ZCOM |
| Logging instruction | LOGTRG(R) |
| PID operation | PID*2 |
| PID control instruction | PIDCONT(P), PIDINIT(P), PIDPRMW(P), PIDRUN(P), PIDSTOP(P), S(P).PIDCONT, S(P).PIDINIT, S(P).PIDPRMW, S(P).PIDRUN, S(P).PIDSTOP |
| Process control instruction*3 | S.2PID, S.□, S.ABS, S.ADD, S.AMR, S.AT1, S.AVE, S.BC, S.BPI, S.BUMP, S.D, S.DBND, S.DED, S.DIV, S.DUTY, S.ENG, S.FG, S.FLT, S.HS, S.I, S.IENG, S.IFG, S.IN, S.IPD, S.LIMIT, S.LLAG, S.LS, S.MID, S.MOUT, S.MUL, S.ONF2, S.ONF3, S.OUT1, S.OUT2, S.PGS, S.PHPL, S.PHPL2, S.PID, S.PIDP, S.PSUM, S.R, S.SEL, S.SPI, S.SQR, S.SUB, S.SUM, S.TPC, S.VLMT1, S.VLMT2 |
| Multiple CPU dedicated instruction*5,*6 | D(P).DDR, D(P).DDWR, M(P).DDR, M(P).DDWR |
| SFC control instruction | AND, ANI, BMOV(P), BRSET, DMOV(P), LD, LDI, MOV(P), OR, ORI, PAUSE, RST, RSTART, SET |
| SFC dedicated instruction | TRAN |
| Safety system instruction*7 | SP.SIDRD |

*1 □ indicates an operator.

*2 RnCPUs, RnENCPUs, and LHCPUs support it.

*3 Only RnPCPUs support it.

*4 The field name and index are not case-sensitive.

*5 Executes during interaction with the system simulation.

*6 LHCPUs do not support it.

*7 Only RnSFCPUs support it.

■Module dedicated instruction

When simulating a system including any of the following modules, the dedicated instructions for the module are available.
For details on the module dedicated instructions, refer to the manual for each module.

| Module type | | Module name |
|---|--------------------------------------|--|
| CPU extension | Ethernet interface module | _RJ71EN71(CCIEC), _RJ71EN71(CCIEF), _RJ71EN71(E+IEC), _RJ71EN71(E+IEF) |
| CC-Link IE TSN compatible motion module | | RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW, RD78G4(S), RD78G8(S), RD78G16(S) |
| Network module | CC-Link IE Field Network module | RJ71GF11-T2, RJ71GF11-T2(MR), RJ71GF11-T2(SR), RJ71GF11-T2(LR) |
| | CC-Link IE TSN module | RJ71GN11-T2 |
| | CC-Link IE Controller Network module | RJ71GP21-SX, RJ71GP21-SX(R), RJ71GP21S-SX, RJ71GP21S-SX(R) |

FX5CPU

■Sequence instruction

| Classification | Symbol |
|----------------------------|---|
| Contact instruction | AND, ANDF, ANDFI, ANDP, ANDPI, ANI, LD, LDF, LDFI, LDI, LDP, LDPI, OR, ORF, ORFI, ORI, ORP, ORPI |
| Output instruction | FF, ALT, ALTP, ANR, ANRP, ANS, OUT, OUT C, OUT F, OUT LC, OUT T/ST, OUTH T/ST, OUTHS T/ST, PLF, PLS, RST, RST F, SET, SET F |
| Master control instruction | MC, MCR |
| Shift instruction | SFT(P) |
| Association instruction | ANB, INV, MEF, MEP, MPP, MPS, MRD, ORB |
| Termination instruction | END, FEND |
| Stop instruction | STOP |

■Basic instruction

| Classification | Symbol ^{*1} |
|----------------------------------|--|
| Comparison operation instruction | AND□(_U), ANDD□(_U), BKCMPO□(P)(_U), CMP(P)(_U), DBKCMPO□(P)(_U), DCMPO(P)(_U), DZCP(P)(_U), LD□(_U), LDD□(_U), OR□(_U), ORD□(_U), ZCP(P)(_U) |
| Arithmetic operation instruction | *(P)(_U), +(P)(_U), -(P)(_U), /(P)(_U), ADD(P)(_U), B*(P), B+(P), B-(P), B/(P), BK+(P)(_U), BK-(P)(_U), D*(P)(_U), D+(P)(_U), D-(P)(_U), D/(P)(_U), DADD(P)(_U), DB*(P), DB+(P), DB-(P), DB/(P), DBK+(P)(_U), DBK-(P)(_U), DDEC(P)(_U), DDIV(P)(_U), DEC(P)(_U), DINC(P)(_U), DIV(P)(_U), DMUL(P)(_U), DSUB(P)(_U), INC(P)(_U), MUL(P)(_U), SUB(P)(_U) |
| Logical operation instruction | BKAND(P), BKOR(P), BKXNR(P), BKXOR(P), DAND(P), DOR(P), DXNR(P), DXOR(P), WAND(P), WOR(P), WXNR(P), WXOR(P) |
| Bit processing instruction | BKRST(P), BRST(P), BSET(P), DTEST(P), TEST(P) |
| Data conversion instruction | BCD(P), BIN(P), BTOW(P), DABIN(P)(_U), DBCD(P), DBIN(P), DDABIN(P)(_U), DECO(P), DGBIN(P)(_U), DGRY(P)(_U), DINT2INT(P), DINT2UDINT(P), DINT2UINT(P), DIS(P), DNEG(P), DVAL(P)(_U), ENCO(P), FLT2DINT(P), FLT2INT(P), FLT2UDINT(P), FLT2UINT(P), GBIN(P)(_U), GRY(P)(_U), HEXA(P), INT2DINT(P), INT2UDINT(P), INT2UINT(P), NDIS(P), NEG(P), NUNI(P), UDINT2DINT(P), UDINT2UINT(P), UIN2DINT(P), UIN2UDINT(P), UIN(P), VAL(P)(_U), WTOB(P) |
| Data shift instruction | BSFL(P), BSFR(P), DSFL(P), DSFR(P), SFL(P), SFR(P), SFTL(P), SFTR(P), WSFL(P), WSFR(P) |
| External device I/O instruction | DSW, SEG, SEGDP, SEGL |
| Data transfer instruction | BLKMOV(P), BMOV(P), CML(P), CMLB(P), DCML(P), DFMV(P), DMOV(P), DPRUN(P), DSWAP(P), DXCH(P), FMOV(P), MOV(P), MOV(P), PRUN(P), SMOV(P), SWAP(P), XCH(P) |

*1 □ indicates an operator.

■Application instruction

| Classification | Symbol ^{*1} |
|---------------------------------------|---|
| Rotation instruction | DRCL(P), DRCP(P), DRCL(P), DROR(P), RCL(P), RCP(P), ROL(P), ROR(P) |
| Program branch instruction | CJ, GOEND |
| Program execution control instruction | DI, EI, IMASK, IRET, SIMASK, WDT(P) |
| Structure creation instruction | BREAK(P), CALL(P), FOR, NEXT, RET, SRET, XCALL |
| Data table operation instruction | FDEL(P), FINS(P), POP(P), SFRD(P), SFWR(P) |
| File operation instruction | SP.FREAD, SP.FWRITE, SP.FDELETE, SP.FCOPY, SP.FMOVE, SP.FRENAME, SP.FSTATUS |

| Classification | Symbol*1 |
|--|---|
| Extended file register operation instruction | ERREAD, ERWRITE, ERINIT |
| String processing instruction | \$+(P), \$MOV(P), \$MOV(P)_WS, AND\$□, ASCI(P), BINDA(P)(_U), DBINDA(P)(_U), DESTR(P), DSTR(P)(_U), ESTR(P), INSTR(P), LD\$□, LEFT(P), LEN(P), MIDR(P), MIDW(P), OR\$□, RIGHT(P), SJIS2WS(P), SJIS2WSB(P), STR(P)(_U), STRDEL(P), STRINS(P), WS2SJIS(P) |
| Random number instruction | RND(P) |
| Index register instruction | ZPOP(P), ZPUSH(P) |
| Data control instruction | BAND(P)(_U), DBAND(P)(_U), DLIMIT(P)(_U), DSCL(P)(_U), DSCL2(P)(_U), DZONE(P)(_U), LIMIT(P)(_U), SCL(P)(_U), SCL2(P)(_U), ZONE(P)(_U) |
| Special timer instruction | STMR, TTMR |
| Shortcut control instruction | ROTC |
| Ramp signal instruction | RAMPF |
| Matrix input instruction | MTR |
| Handy instruction | ABSD, DABSD, INCD, IST |
| Check code | CCD(P) |
| Data processing instruction | BON(P), CRC(P), DBON(P), DMAX(P)(_U), DMEAN(P)(_U), DMIN(P)(_U), DSERDATA(P), DSERMM(P), DSORTTBL2(_U), DSQRT(P), DSUM(P), DWSUM(P)(_U), MAX(P)(_U), MEAN(P)(_U), MIN(P)(_U), SERMM(P), SORTTBL(_U), SORTTBL2(_U), SQRT(P), SUM(P), WSUM(P)(_U) |
| Indirect address read instruction | ADRSET(P) |
| Clock instruction | ANDDT□, ANDTM□, DHTOS(P), DSTOH(P), HTOS(P), LDDT□, LDTM□, ORDT□, ORTM□, STOHP), TADD(P), TCMP(P), TRD(P), TSUB(P), TWR(P), TZCP(P) |
| Timing check instruction | DHOURM, DUTY, HOURM |
| Module access instruction | DFROM(P), DFROMD(P), DTO(P), DTOD(P), FROM(P), FROMD(P), TO(P), TOD(P) |
| Real-time Monitor Function Instruction | RTM |
| Step ladder instruction | STL, RETSTL |
| PID operation | PID |
| Real number instruction | ACOS(P), ANDE□, ASIN(P), ATAN(P), COS(P), DACOS(P), DASIN(P), DATAN(P), DCOS(P), DDEG(P), DEADD(P), DEBCD(P), DEBIN(P), DEDIV(P), DEG(P), DEMOV(P), DEMUL(P), DENEG(P), DESQR(P), DESUB(P), DEVAL(P), DEXP(P), DEZCP(P), DINT2FLT(P), DLOGE(P), DLOG10(P), DRAD(P), DSIN(P), DTAN(P), E*(P), E+(P), E-(P), E/(P), ECMP(P), EMAX(P), EMIN(P), EMOV(P), ENEG(P), ESQRT(P), EVAL(P), EXP(P), INT2FLT(P), LDE□, LOG(P), LOG10(P), ORE□, POW(P), RAD(P), SIN(P), TAN(P), UDINT2FLT(P), UINT2FLT(P) |
| SFC control instruction | AND, ANI, BMOV(P), DMOV(P), LD, LDI, MOV(P), OR, ORI, OUT, PAUSE, RST, RSTART, SET, ZRST(P) |
| SFC dedicated instruction | TRAN |

*1 □ indicates an operator.

■Module dedicated instruction

When simulating a system including any of the following modules, the dedicated instructions for the module are available. For details on the module dedicated instructions, refer to the manual for each module.

| Module type | | Module name |
|---|---------------------------------|--------------------------------|
| CC-Link IE TSN compatible motion module | | FX5-40SSC-G(S), FX5-80SSC-G(S) |
| Network module | CC-Link IE Field Network module | FX5-CCLIEF |
| | CC-Link IE TSN module | FX5-CCLGN-MS |

Supported parameters

The simulation function does not support some parameter setting items.

The following shows the parameter setting items which are supported by the simulation function.

RCPU

■System parameter

| Item | | |
|--------------------------------------|---|---|
| I/O Assignment Setting | Base/Power/Extension Cable Setting | Slots |
| | | Base/Power Supply Module/Extension Cable |
| | I/O Assignment Setting | Module Name |
| | | Module Status Setting |
| | | Module/Points/Start XY |
| | | Control PLC Setting |
| | | CPU Module Operation Setting at Error Detection |
| | Setting of Points Occupied by Empty Slot | |
| Multiple CPU Setting | Setting for number of CPU modules | |
| | Communication Setting between CPU | Refresh setting |
| | | CPU Buffer Memory Setting |
| | | PLC Unit Data |
| | | Fixed Scan Communication Function |
| | Fixed Scan Communication Setting | Fixed Scan Communication Area Setting |
| | | Fixed Scan Interval Setting of Fixed Scan Communication |
| | Operation Mode Setting | Fixed Scan Communication Function and Inter-module Synchronization Function |
| | | Stop Setting |
| Inter-module Synchronization Setting | Synchronous Startup Setting | |
| | Other PLC Control Module Setting | |
| | I/O Setting Outside Group | |
| | Use Inter-module Synchronization Function in System | |
| | Select Inter-module Synchronization Target Module | |
| | Fixed Scan Interval Setting of Inter-module Synchronization | |
| | Inter-module Synchronization Master Setting | |

■CPU parameter

| Item | |
|----------------------------|---|
| Operation Related Setting | Timer Limit Setting |
| | RUN-PAUSE Contact Setting |
| | Remote Reset Setting (same operation as for "Enable") |
| | Output Mode Setting at STOP to RUN |
| | Module Synchronous Setting |
| | Clock Related Setting |
| Interrupt Settings | Fixed Scan Interval Setting |
| | Fixed Scan Execution Mode Setting |
| | Interrupt Enable Setting in Executing Instruction |
| | Block No. Save/Recovery Setting |
| | Interrupt Priority Setting from Module |
| Service Processing Setting | Device/Label Access Service Processing Setting |
| File Setting | File Register Setting |
| | Initial Value Setting ^{*1} |
| | Label Initial Value Reflection Setting ^{*2} |
| | File Setting for Device Data Storage |

| Item | | | |
|---|--|--|--|
| Memory/Device Setting | Device/Label Memory Area Setting | Extended SRAM Cassette Setting | |
| | | Device/Label Memory Area Capacity Setting | |
| | | Device/Label Memory Area Detailed Setting | Points |
| | | | Safety device points ^{*3} |
| | | | Local Device |
| | | | Safety local device ^{*3} |
| | | | Latch Range Setting |
| | | Write Protection Setting ^{*4} | |
| | Latch Type Setting of Latch Type Label | | |
| | Index Register Setting | | |
| | Refresh Memory Setting | | |
| | Device Latch Interval Setting | | |
| | Pointer Setting | | |
| | Internal Buffer Capacity Setting | | |
| Link Direct Device Setting | | | |
| RAS Setting | Scan Time Monitoring Time (WDT) Setting | | |
| | Constant Scan Setting | | |
| | Error Detections Setting | Battery Error | |
| | | Module Verification Error | |
| | | Fuse Blown | |
| | | Redundant Power Supply System Error (same operation as for "Not Detected") | |
| | CPU Module Operation Setting at Error Detected | | |
| | LED Display Setting | | |
| | Event History Setting ^{*5} | — | |
| Save Device/Label Operations | | | |
| Program Setting | Program Setting | Program Setting | Execute Order |
| | | | Program Name |
| | | | Execution Type |
| | | | Detailed Setting Information (Fixed Scan) |
| | | | Detailed Setting Information (Event) |
| | | | Device/File Use or not |
| | | | Both Systems Program Executions Setting (same operation as for "Control System Execution") ^{*6} |
| | FB/FUN File Setting | | |
| SFC Setting | SFC Program Start Mode Setting | | |
| | Start Conditions Setting | | |
| | Output Mode Setting at Block Stop | | |
| Refresh Setting between Multiple CPUs | Refresh Setting (At the END) | | |
| | Refresh Setting (At I45 Exe.) | | |
| Redundant System Settings ^{*8} | Redundant Behavior Setting | Watching Standby System Setting (same operation as for "Disable") | |
| Safety Function Setting | Safety Function Setting | Safety Cycle Time ^{*3} | |
| | | Safety I/O Hold Time ^{*7} | |

*1 "Memory Card" can be specified for "Target Memory."

*2 RnPCPUs and RnPSFCPUs support it.

*3 RnSFCPUs and RnPSFCPUs support it.

*4 RnPCPUs and RnPSFCPUs do not support it.

*5 "Memory Card" can be specified for "Save Destination."

*6 RnPCPUs (redundant mode) and RnPSFCPUs support it.

*7 Only RnPSFCPUs support it.

*8 Only RnPCPUs (redundant mode) support it.

■Module parameter

| Item | | | |
|----------------------|------------------------------------|--------------------------------|------------|
| Required Settings*1 | Station Type | | |
| Basic Settings*1 | Own Node Settings*2 | Parameter Setting Method | |
| | | IP Address*3 | IP Address |
| | | Default Gateway*4 | |
| | | Enable/Disable Online Change*4 | |
| | | Communication Data Code*4 | |
| | | Opening Method*4 | |
| | Refresh Settings | | |
| Application Settings | Web Server Settings*5*6 | | |
| | Simple CPU Communication Setting*7 | | |
| Refresh Setting*8 | | | |

*1 Only network modules support it.

*2 The IP address setting is available only for CPUs that are simulated in the system simulation.

*3 The IP address set in this parameter is available only in a simulation of simple CPU communication.

*4 RnSFCPU and RnPSFCPU support it.

*5 RnSFCPU and RnPSFCPU do not support it.

*6 The value in the account setting cannot be changed. (☞ Page 1045 Account)

*7 Any of the following options can be selected for "Communication Destination":

- MELSEC iQ-R (built-in Ethernet)
- MELSEC iQ-L (built-in Ethernet)
- MELSEC iQ-F (built-in Ethernet)

*8 Modules except for network modules support it.

■Memory card parameter

| Item |
|--|
| Setting of File/Data Use or Not in Memory Card ^{*1} |

*1 "Device Station Parameter" cannot be set.

A

LHCPU

■System parameter

| Item | | |
|------------------------|------------------------|------------------------|
| I/O Assignment Setting | I/O Assignment Setting | Module Name |
| | | Module Status Setting |
| | | Module/Points/Start XY |

■CPU parameter

| Item | | | | |
|--|---|---|---|--|
| Operation Related Setting | Timer Limit Setting | | | |
| | RUN-PAUSE Contact Setting | | | |
| | Remote Reset Setting (same operation as for "Enable") | | | |
| | Output Mode Setting at STOP to RUN | | | |
| | Clock Related Setting | | | |
| Interrupt Settings | Fixed Scan Interval Setting | | | |
| | Fixed Scan Execution Mode Setting | | | |
| | Block No. Save/Recovery Setting | | | |
| Service Processing Setting | Device/Label Access Service Processing Setting | | | |
| File Setting | File Register Setting | | | |
| | Initial Value Setting* ¹ | | | |
| | Label Initial Value Reflection Setting | | | |
| | File Setting for Device Data Storage | | | |
| Memory/Device Setting | Device/Label Memory Area Setting | Device/Label Memory Area Capacity Setting | | |
| | | Device/Label Memory Area Detailed Setting | Points | |
| | | | Local Device | |
| | | | Latch Range Setting | |
| | | | Latch Type Setting of Latch Type Label | |
| | Index Register Setting | | | |
| | Refresh Memory Setting | | | |
| | Device Latch Interval Setting | | | |
| | Pointer Setting | | | |
| | Internal Buffer Capacity Setting | | | |
| | Link Direct Device Setting | | | |
| | RAS Setting | Scan Time Monitoring Time (WDT) Setting | | |
| | | Constant Scan Setting | | |
| Error Detections Setting | | Battery Error | | |
| | | Fuse Blown | | |
| CPU Module Operation Setting at Error Detected | | | | |
| LED Display Setting | | | | |
| Event History Setting* ² | | | | |
| Program Setting | Program Setting | Program Setting | Program Name | |
| | | | Execution Type | |
| | | | Detailed Setting Information (Fixed Scan) | |
| | | | Detailed Setting Information (Event) | |
| | | | Device/File Use or not | |
| FB/FUN File Setting | | | | |
| SFC Setting | SFC Program Start Mode Setting | | | |
| | Start Conditions Setting | | | |
| | Output Mode Setting at Block Stop | | | |

*1 "Memory Card" can be specified for "Target Memory."

*2 "Memory Card" can be specified for "Save Destination."

■Module parameter

| Item | |
|----------------------|--|
| Application Settings | Simple CPU Communication Setting ^{*1} |

- ^{*1} Any of the following options can be selected for "Communication Destination":
- MELSEC iQ-R (built-in Ethernet)
 - MELSEC iQ-L (built-in Ethernet)
 - MELSEC iQ-F (built-in Ethernet)

■Memory card parameter

| Item | |
|--|--|
| Setting of File/Data Use or Not in Memory Card ^{*1} | |

- ^{*1} "Device Station Parameter" cannot be set.

FX5CPU

■System parameter

| Item | |
|------------------------|--|
| I/O Assignment Setting | Model Name |
| | Intelligent Module No. |
| | Serial Communication ch |
| | Number of Input Points |
| | Number of Output Points |
| | CPU Module Operation Setting at Error Detected |


■CPU parameter

| Item | | |
|-----------------------------------|--|---|
| Name Setting | Title Setting | |
| | Comment Setting | |
| Operation Related Setting | RUN Contact Setting | |
| | Remote Reset Setting | |
| | Clock Related Setting | Time Zone |
| Interrupt Settings | Fixed Scan Interval Setting | |
| | Fixed Scan Execution Mode Setting | |
| | Interrupt Priority Setting from Module | |
| Service Processing Setting | Device/Label Access Service Processing Setting | |
| File Setting | Initial Value Setting | |
| Memory/Device Setting | Device/Label Memory Area Setting | Option Battery Setting |
| | | Device/Label Memory Area Capacity Setting |
| | | Device/Label Memory Area Detailed Setting |
| | Index Register Setting | |
| | Pointer Setting | |
| | Internal Buffer Capacity Setting | |
| RAS Setting | Scan Time Monitoring Time (WDT) Setting | |
| | Constant Scan Setting | |
| | Error Detections Setting | |
| | CPU Module Operation Setting at Error Detected | |
| | LED Display Setting | |
| | Event History Setting | |
| Program Setting | Program Setting | |
| | FB/FUN File Setting | |
| | Program Capacity Setting ^{*1} | |
| SFC Setting | SFC Program Setting | |
| | SFC Program Start Mode Setting | |
| | Start Conditions Setting | |
| | FX3 Compatible Transition Operation Mode Setting | |
| PID Control Setting ^{*1} | Heating/Cooling PID Control Setting | |

^{*1} FX5UCPUs and FX5UCCPUs support it.

■Module parameter (Ethernet port)

| Item | | |
|----------------------|--|------------|
| Basic Settings | Own Node Settings | IP Address |
| Application Settings | Web Server Settings* ¹ | |
| | Simple CPU Communication Setting* ² | |

*1 The value in the account setting cannot be changed. ( Page 1045 Account)

*2 Any of the following options can be selected for "Communication Destination":

- MELSEC iQ-R (built-in Ethernet)
- MELSEC iQ-L (built-in Ethernet)
- MELSEC iQ-F (built-in Ethernet)

■Module parameter (expansion board)

| Item | |
|----------------|-----------------|
| Basic Settings | Expansion Board |

■Module parameter (network module)

| Item | | |
|----------------------|--------------------------|--|
| Required Settings | Network No. | Network No. |
| | Station No. | Setting Method |
| | | Station No. |
| | Parameter Setting Method | Setting Method of Basic/Application Settings |
| Basic Settings | Refresh Settings | |
| Application Settings | Module Operation Mode | |

Process response operation

The following shows the specifications when using a process response operation in the I/O system setting function.

For details on the conversion processing, refer to the following:

📖 MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions)

DIRECT

Convert an input value to an output value by using a specified upper and lower limit.



- IENG: Engineering value inverse conversion
- ENG: Engineering value conversion

■Instruction format

to := DIRECT(to_min, to_max, from_min, from_max, from)

■Argument

| Argument name | Data type | Description | Range |
|---------------|-----------------|--------------------------------|------------------------------|
| to_min | REAL (Constant) | Lower limit of an output value | -999999.0<=to_min<to_max |
| to_max | REAL (Constant) | Upper limit of an output value | to_min<to_max<=999999.0 |
| from_min | REAL (Constant) | Lower limit of an input value | -999999.0<=from_min<from_max |
| from_max | REAL (Constant) | Upper limit of an input value | from_min<from_max<=999999.0 |
| from | REAL | Input value | — |

■Return value

Output value: REAL

REVERSE

Convert an input value to an output value by using a specified upper and lower limit.



- IENG: Engineering value inverse conversion
- REV: Inversion
- ENG: Engineering value conversion

■Instruction format

to := REVERSE(to_min, to_max, from_min, from_max, from)

■Argument

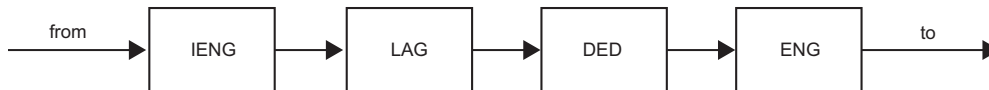
| Argument name | Data type | Description | Range |
|---------------|-----------------|--------------------------------|------------------------------|
| to_min | REAL (Constant) | Lower limit of an output value | -999999.0<=to_min<to_max |
| to_max | REAL (Constant) | Upper limit of an output value | to_min<to_max<=999999.0 |
| from_min | REAL (Constant) | Lower limit of an input value | -999999.0<=from_min<from_max |
| from_max | REAL (Constant) | Upper limit of an input value | from_min<from_max<=999999.0 |
| from | REAL | Input value | — |

■Return value

Output value: REAL

LAG_DED

Convert an input value to an output value by using a specified upper and lower limit.



- IENG: Engineering value inverse conversion
- LAG: Primary delay
- DED: Dead time
- ENG: Engineering value conversion

■Instruction format

to := LAG_DED(to_min, to_max, from_min, from_max, lag, ded, from)

■Argument

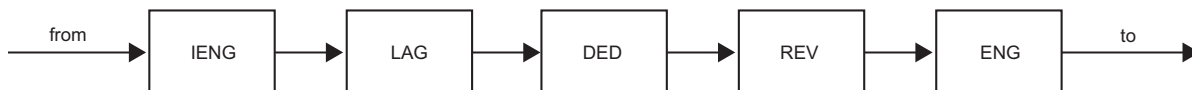
| Argument name | Data type | Description | Range |
|---------------|-----------------|--------------------------------|------------------------------|
| to_min | REAL (Constant) | Lower limit of an output value | -999999.0<=to_min<to_max |
| to_max | REAL (Constant) | Upper limit of an output value | to_min<to_max<=999999.0 |
| from_min | REAL (Constant) | Lower limit of an input value | -999999.0<=from_min<from_max |
| from_max | REAL (Constant) | Upper limit of an input value | from_min<from_max<=999999.0 |
| lag | REAL (Constant) | Lag time constant (second) | 0.0<=lag<=999999.0 |
| ded | INT (Constant) | Dead time (second) | 0<=ded<=999 |
| from | REAL | Input value | — |

■Return value

Output value: REAL

LAG_DED_REV

Convert an input value to an output value by using a specified upper and lower limit.



- IENG: Engineering value inverse conversion
- LAG: Primary delay
- DED: Dead time
- REV: Inversion
- ENG: Engineering value conversion

■Instruction format

to := LAG_DED_REV(to_min, to_max, from_min, from_max, lag, ded, from)

■Argument

| Argument name | Data type | Description | Range |
|---------------|-----------------|--------------------------------|------------------------------|
| to_min | REAL (Constant) | Lower limit of an output value | -999999.0<=to_min<to_max |
| to_max | REAL (Constant) | Upper limit of an output value | to_min<to_max<=999999.0 |
| from_min | REAL (Constant) | Lower limit of an input value | -999999.0<=from_min<from_max |
| from_max | REAL (Constant) | Upper limit of an input value | from_min<from_max<=999999.0 |
| lag | REAL (Constant) | Lag time constant (second) | 0.0<=lag<=999999.0 |
| ded | INT (Constant) | Dead time (second) | 0<=ded<=999 |
| from | REAL | Input value | — |

■Return value

Output value: REAL

Module buffer memory

The following shows the number of points of buffer memory (U□\G) for a module supported by the simulation function. When simulating the following systems, the number of points supported by MT Simulator2 or SMM Simulator can be used. The number may differ from the one shown in this section.

- Page 549 Multiple CPU system
- Page 552 Programmable controller CPU and motion CPU
- Page 556 Simple motion module/motion module
- Page 558 Network modules

| Series | Module type | | Points |
|---|---|--------------------------------------|----------|
| MELSEC iQ-R | PLC CPU | | 8388608 |
| | MELSECWinCPU | | |
| | Motion CPU | | |
| | Redundant module | | 2097152 |
| | Safety CPU | | 2048 |
| | SIL2 function module | | 131072 |
| | Input | | |
| | Output | | |
| | I/O | | |
| | NC dedicated module | | |
| | Analog input | | |
| | Analog output | | |
| | Temperature input | | |
| | Temperature control module | | |
| | Simple motion | RD77MS | |
| | | RD77GF | |
| | CC-Link IE TSN compatible motion module | | 16777216 |
| | Pulse I/O, Positioning*1 | | 131072 |
| | Energy measuring module | | 12582912 |
| | Information module | Serial communication module | |
| | | Ethernet interface module | |
| | | High speed data logger module | |
| | | MES interface module | |
| | | OPC UA Server module | |
| | | Recorder module | |
| | | C intelligent function module | |
| | | High speed data communication module | |
| | | Camera recorder module | |
| | | GP-IB interface module | |
| | Network Module | CC-Link system master/local module | 131072 |
| | | CC-Link IE Field Network module | 12582912 |
| | | CC-Link IE Controller Network module | 131072 |
| AnyWireASLINK master module | | | |
| BACnet interface module | | | |
| CANopen module | | 8388608 | |
| EtherNet/IP module | | | |
| DeviceNet master/slave module | | | |
| PROFIBUS interface module | | 131072 | |
| CC-Link IE TSN module | | 16777216 | |
| CC-Link IE TSN Plus master/local module | | 12582912 | |
| MELSECNET/H network module | | | |

| Series | Module type | | Points | |
|-------------|-----------------------------|-----------------------------------|--------|--|
| MELSEC iQ-L | PLC CPU | | 2048 | |
| | Network module | CC-Link module | 32768 | |
| | Motion module | | 131072 | |
| | Intelligent function module | | 61440 | |
| MELSEC iQ-F | Simple motion | | 98304 | |
| MELSEC-Q | Analog input | | 131072 | |
| | Analog output | | | |
| | Analog I/O | | | |
| | Temperature input | | | |
| | Temperature control module | | | |
| | Loop control | | | |
| | Pulse I/O, Positioning | | | |
| | Energy measuring module | | | |
| | Information module | Intelligent communications module | | |
| | | MES interface module | | |
| | | Web server module | | |
| | Network Module | AnyWireASLINK master module | | |
| | | CC-Link/LT master module | | |
| | | AS-i master module | | |
| | | MELSECNET/H network module | | |
| | | FL-net (OPCN-2) interface module | | |
| | | MODBUS(R) interface module | | |
| | | DeviceNet master/slave module | | |
| | | Partner products | | |

*1 For a counter module, the actual number of buffer memory points that can be used is up to 1024.

Link devices of network module

The following shows the link devices and the number of points for network module supported by the simulation function.

| Series | Module type | | Device type | Points |
|-------------|---|--|-------------|--------|
| MELSEC iQ-R | Network module | Ethernet (When using CC-Link IE Controller Network) | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 8192 |
| | | | J□\Y | |
| | | | J□\B | 65538 |
| | | | J□\W | 262144 |
| | | Ethernet (When using CC-Link IE Field Network) | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 16384 |
| | | | J□\Y | |
| | | | J□\W | |
| | | CC-Link IE Controller Network | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 8192 |
| | | | J□\Y | |
| | | | J□\B | 65538 |
| | | | J□\W | 262144 |
| | | CC-Link IE Field Network | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 16384 |
| | | | J□\Y | |
| | | | J□\W | |
| | | CC-Link IE TSN | J□\SB | 4096 |
| | | | J□\SW | |
| | | | J□\X | 16384 |
| | | | J□\Y | |
| | | | J□\B | 32768 |
| | | | J□\W | |
| | | MELSECNET/H network module | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 8192 |
| | | | J□\Y | |
| | | | J□\B | 16384 |
| | | | J□\W | |
| | Simple motion module | RD77GF | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 16384 |
| | | | J□\Y | |
| | | | J□\W | |
| | CC-Link IE TSN compatible motion module | RD78G(H) RD78G(S) | J□\SB | 4096 |
| | | | J□\SW | |

| Series | Module type | | Device type | Points |
|-------------|----------------|--------------------------|-------------|--------|
| MELSEC iQ-L | Network module | CC-Link IE Field Network | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 16384 |
| | | | J□\Y | |
| | | | J□\W | 16384 |
| | Motion module | LD78G(S) | J□\SB | 4096 |
| | | | J□\SW | |
| | | | J□\X | 16384 |
| | | | J□\Y | |
| | | | J□\W | 4096 |
| MELSEC-Q | Network module | MELSECNET/H network | J□\SB | 512 |
| | | | J□\SW | |
| | | | J□\X | 8192 |
| | | | J□\Y | |
| | | | J□\B | 16384 |
| | | | J□\W | |

Network

The following shows the network types, network modules, network functions, network parameters, and network module dedicated instructions that are supported by the simulation function (simulation of network modules).

For details on each item, refer to the manual for each network module.

Network types

| Series | Network type |
|-------------|-------------------------------|
| MELSEC iQ-R | CC-Link IE Controller Network |
| | CC-Link IE Field Network |
| | CC-Link IE TSN |
| MELSEC iQ-F | CC-Link IE Field Network |
| | CC-Link IE TSN |

Network modules

| Series | Network module |
|-------------|------------------------|
| MELSEC iQ-R | RnENCPU (network part) |
| | RJ71EN71 |
| | RJ71GP21-SX |
| | RJ71GF11-T2 |
| | RJ71GN11-T2 |
| MELSEC iQ-F | FX5-CCLIEF |
| | FX5-CCLGN-MS |

Network functions

■CC-Link IE Controller Network

| Function | | Remarks |
|------------------------|---|---|
| Cyclic transmission | Communication with another station | — |
| | Link refresh | |
| | Direct access for link devices | |
| | Cyclic data integrity assurance | |
| | Interlink transmission | Data is sent for each station regardless of the parameter setting contents. |
| | Cyclic transmission punctuality assurance | |
| | Group cyclic transmission | |
| | Cyclic transmission stop and restart | |
| Transient transmission | Dedicated instruction | — |
| | Group transient transmission | |
| RAS | External power supply | Same operation as for OFF. |
| Others | Interrupt request to CPU module | — |

■CC-Link IE Field Network

| Function | | Remarks |
|------------------------|--|---|
| Cyclic transmission | Communications using RX, RY, RWr, and RWw | — |
| | Link refresh | |
| | Direct access for link devices | |
| | Cyclic data integrity assurance | |
| | Interlink transmission | |
| | Sequence scan synchronization specification | |
| | Cyclic transmission punctuality assurance | |
| | I/O maintenance settings | |
| | Output hold/clear setting during CPU STOP | |
| Transient transmission | Data link faulty station setting | Data is sent for each station regardless of the parameter setting contents. |
| | Cyclic transmission stop and restart | |
| | Communications within the same network | |
| | Self-diagnostics function | |
| | CC-Link IE Field Network synchronous communication | |
| | Reserved station | |
| | Error invalid station | |
| | Interrupt request to CPU module | |
| | Safety communication | |

■CC-Link IE TSN

| Function | | Remarks |
|------------------------|--|---|
| Cyclic transmission | Communications using RX, RY, RWr, and RWw | — |
| | Communications using LB and LW | |
| | Link refresh | |
| | Direct access to link devices | |
| | Cyclic data assurance | |
| | Communication cycle coexistence | |
| | Interlink transmission | |
| | I/O maintenance settings | |
| | Output hold/clear setting during CPU STOP | |
| Transient transmission | Data link faulty station setting | Data is sent for each station regardless of the parameter setting contents. |
| | Communications using a dedicated instruction | |
| | IP filter | |
| | Master station duplication detection | |
| | IP address duplication detection | |
| | Time synchronization | |
| | CC-Link IE TSN network synchronous communication | |
| | Safety communications | |
| | Troubleshooting | |
| Others | CC-Link IE TSN diagnostics | This function is not available for communicating with an external device. |
| | Reserved station | |
| | Error invalid station setting | |

A

Network parameters

■CC-Link IE Controller Network

| Parameter | | | Remarks |
|----------------------|-------------------------------------|---------------------------|--|
| Required Settings | Station Type | Station Type | — |
| | Network No. | Network No. | |
| | Station No. | Setting Method | |
| | | Station No. | |
| | Network Range Assignment | Total No. of Stations | |
| | | LB/LW Setting (1) | |
| | | LB/LW Setting (2) | |
| | | LX/LY Setting (1) | |
| | | LX/LY Setting (2) | |
| | | I/O Master Station | |
| | | Reserved Station | |
| | | Pairing | Since system switching is not supported by simulator, cyclic transmission is performed only from a control system. |
| Shared Group Setting | — | | |
| Basic Settings | Refresh Settings | | |
| Application Settings | Supplementary Cyclic Settings | Data Link Monitoring Time | |
| | | Constant Link Scan Time | |
| | | Transient Setting | Punctuality Assurance |
| | | | Maximum No. of Transients in One Station |
| | Link points extended setting | | |
| | Interrupt Settings | | |
| | Transient Transmission Group No. | | |
| | Parameter Name | | |
| | Event Reception from Other Stations | | |
| | Module Operation Mode | | |
| | Interlink Transmission Settings | | |

■CC-Link IE Field Network

| Parameter | | | Remarks |
|----------------------|---------------------------------|---|---|
| Required Settings | Station Type | Station Type | A submaster station always operates as a local station. |
| | Network No. | Network No. | |
| | Station No. | Station No. | |
| | Parameter Setting Method | Setting Method | |
| Basic Settings | Network Configuration Settings | Setting Method of Basic/Application Settings | |
| | | Total Linked Stations | |
| | | Station No. | |
| | | Model Name | |
| | | Station Type | |
| | | RX/RX | |
| | | RWr/RWw | |
| | | Reserved/Error Invalid Station/System Switching Monitoring Target Station | Only "Reserved Station" and "Error Invalid Station" can be set. |
| | | Pairing | Since system switching is not supported by simulator, cyclic transmission is performed only from a control system. |
| | | Network Synchronous Communication | This parameter is available only for network modules (local stations) that are simulated in the system simulation support this parameter. |
| Application Settings | Refresh Setting | Alias | |
| | | Comment | |
| | | Refresh Setting (SB/SW) | |
| | | Refresh Setting | |
| | Supplementary Cyclic Settings | Link Scan Mode | |
| | | I/O Maintenance Settings | Output Hold/Clear Setting during CPU STOP |
| | | | Data Link Error Station Setting |
| | Interrupt Settings | | Output Mode upon CPU Error |
| | | Communication Mode | |
| | | Parameter Name | |
| | | Event Reception from Other Stations | |
| | Module Operation Mode | | |
| | Interlink Transmission Settings | | |
| | Safety Communication Setting | To Use or Not to Use the Safety Communication Setting | |
| | | Safety Communication Setting | |

■CC-Link IE TSN

| Parameter | | | | Remarks | |
|-------------------------------------|--|---|--|---|---|
| Required Settings | Station Type | Station Type | | — | |
| | Network No. | Network No. | | | |
| | Station No./IP Address Setting | Station No./IP Address Setting Method | | | |
| | | Station No. | | | |
| | | IP Address | IP Address | These parameters are not available for communicating with an external device. | |
| | Subnet Mask | | | | |
| | Default Gateway | | | | |
| Parameter Setting Method | Setting Method of Basic/Application Settings | | — | | |
| Basic Settings | Network Configuration Settings | Station Type | | — | |
| | | RX/RY | | | |
| | | RWr/RWw | | | |
| | | LB/LW | | | |
| | | IP Address | | These parameters are not available for communicating with an external device. | |
| | | Subnet Mask | | | |
| | | Default Gateway | | | |
| | | Reserved/Error Invalid Station | | — | |
| | | Network Synchronous Communication | | This parameter is available only for local stations. | |
| | | Communication Period Setting | Multiple Period Setting (Normal-Speed/Low-Speed) | | |
| | Station Information | Alias | — | | |
| | | Comment | | | |
| | Refresh Settings | | | These parameters are available only for local stations. | |
| | Communication Period Setting | Basic Period Setting | Transient Transmission Time | | |
| | | Multiple Period Setting | Normal-Speed | | |
| | | | Low-Speed | | |
| | Safety Communication Setting | To Use or Not to Use the Safety Communication Setting | | — | |
| | | Safety Communication Setting | | | |
| | Application Settings | Communication Speed | | | These parameters are not available for communicating with an external device. |
| Supplementary Cyclic Settings | | Station-based Block Data Assurance | | | |
| | | I/O Maintenance Settings | Output Hold/Clear Setting during CPU STOP | | |
| | | | Data Link Error Station Setting | | |
| | | | Output Mode upon CPU Error | | |
| Transient Transmission Group No. | | | | | |
| Communication Mode | | | | | |
| Parameter Name | | | | | |
| Event Reception from Other Stations | | | | | |
| Module Operation Mode | | | | | |
| Security | | IP Filter Settings | IP Filter | | |
| | | | IP Filter Settings | Access from IP address below (Deny/Allow) | |
| | | | | Range Setting | |
| | | | | IP Address | |
| | | | | IP Address Excluded from Range | |
| Interlink Transmission Settings | | | — | | |

Dedicated instructions for network modules

■CC-Link IE Controller Network

| Classification | Symbol |
|----------------------------|---|
| Link dedicated instruction | READ, SREAD, WRITE, SWRITE, SEND, RECV, RECVS, REQ, RRUN, RSTOP, RTMRD, RTMWR |
| Others | UINI |

■CC-Link IE Field Network

| Classification | Symbol |
|----------------------------|--|
| Link dedicated instruction | READ, SREAD, WRITE, SWRITE, SEND, RECV, RECVS, REQ |
| Others | CCPASET, UINI |

■CC-Link IE TSN

| Classification | Symbol |
|----------------------------|---|
| Link dedicated instruction | READ, SREAD, WRITE, SWRITE, SEND, RECV, REQ |
| Others | CCPASET, CCPASETX, UINI |

Precautions

Note that no processing is performed for unsupported instructions (NOP processing).

Considerations

The following describes the considerations on debugging programs using the simulation function.

Program execution time

Since the instruction processing speed differs between the simulation function and CPU module, the simulator operates as follows.

- A simulation time is calculated by adding a value of instruction processing time every execution of an instruction in a CPU module.

The simulator operates behind the actual time when the simulation time takes longer than the actual time due to the performance of a personal computer.

The simulation time gains in accordance with the actual time when the actual time takes longer than the simulation time.

- When the actual scan time is longer than a value set in the following CPU parameter, a constant scan time error does not occur even after a constant scan time is exceeded; therefore, instructions continue.

· [CPU Parameter] ⇒ [RAS Setting] ⇒ [Constant Scan Setting]

For instruction processing time, refer to the following:

📖 MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

Periodic execution type program

A program is executed in accordance with the simulation time.

If the load on GX Simulator3 is high due to the number of periodic execution type programs and their cycles, the response from GX Simulator3 is delayed and a communication error may occur.

Handling of floating point

A rounding error may occur in the operation result of an instruction using floating point. The result will not be the same as that of a CPU module.

Multiple CPU system function

The multiple CPU system function can be used for only CPU modules that are simulated in the system simulation.

Simulation for a single CPU module or CPU modules that are not simulated are not supported.

No errors are detected in CPU modules that are not simulated and modules controlled by the CPUs.

RnSFCPU

■ Safety operation mode

The simulation function can be used in the test mode only.

■ Safety support functions

The following menus cannot be performed during a simulation.

- [Online] ⇒ [Safety PLC Operation] ⇒ [Check Safety Data Identity]
- [Online] ⇒ [Safety PLC Operation] ⇒ [Switch Safety Operation Mode]
- [Online] ⇒ [User Authentication]

■ Identification check for safety data

When the target for writing is a simulator, the writing is not treated as one to a programmable controller.

Therefore, the file ID and the writing date and time are not updated.

LHCPU

The following explains the display content in the GX Simulator3 (system simulation) screen when simulating a project for an LHCPU.

- A system is always displayed with all the blocks in the table below configured.

The following table shows the maximum number of modules which can be attached in each block.

| Block | Number of modules (maximum) | Remarks |
|-------------------|-----------------------------|--|
| Main block | 9 ^{*1} | Power supply modules, branch modules, extension modules, and END covers are not displayed in the GX Simulator3 (system simulation) screen. |
| Extension block 1 | 10 | |
| Extension block 2 | 10 | |
| Extension block 3 | 11 | |

*1 Excluding the CPU and built-in I/O parts of a CPU module.

- Modules are placed from the head of the main block. If one block is not enough for placing all the modules, the rest is placed in the next block.
- A module which occupies the size for two modules is counted as two modules. If a block does not have size for two more modules, the module is placed at the head of the next block.
- If a blank row exists between modules in the I/O assignment setting of the system parameter, "(Empty)" is displayed in the GX Simulator3 (system simulation) screen.
- If the number of placed modules exceeds the maximum number of attachable modules, GX Simulator3 operates as follows:
 - Simulation of a CPU module: The simulation regards modules in excess of the maximum number as not placed.
 - System simulation: An error indicating a module configuration error occurs when adding the system in the GX Simulator3 (system simulation) screen.

General module

When a general module is set in the I/O assignment setting of the system parameter, the inputs (X), outputs (Y), and buffer memory of the general module can be accessed.

The following table shows the range of accessible inputs (X), outputs (Y), and buffer memory.

| Series | Module name | Type | Input (X)/output (Y) | Buffer memory |
|-------------|----------------------------|------------------------|--|---|
| MELSEC iQ-R | General CPU module | — | — | Equivalent to a CPU module of a simulator |
| | General I/O module | Input | Follows the number of occupied points of a slot set in the I/O assignment setting of the system parameter. | Equivalent to an input module. |
| | | Output | | Equivalent to an output module. |
| | | High-speed input | | Equivalent to an input module. |
| | | Interrupt | | Equivalent to an analog input module. |
| | | I/O mixed (Mixed) | | Equivalent to an I/O module. |
| | | I/O mixed (Both sides) | | Equivalent to an I/O module. |
| | General intelligent module | — | | Equivalent to an analog input module. |
| MELSEC iQ-L | General I/O module | Input | | Equivalent to an input module. |
| | | Output | | Equivalent to an output module. |
| | | I/O mixed (Both sides) | | Equivalent to an I/O module. |
| | General intelligent module | — | | Equivalent to an analog input module. |
| MELSEC-Q | General I/O module | Input | | Equivalent to an input module. |
| | | Output | | Equivalent to an output module. |
| | | High-speed input | | Equivalent to an input module. |
| | | Interrupt | | Equivalent to an analog input module. |
| | | I/O mixed (Mixed) | | Equivalent to an I/O module. |
| | | I/O mixed (Both sides) | | Equivalent to an I/O module. |
| | General intelligent module | — | | Equivalent to an analog input module. |
| MELSEC iQ-F | General I/O module | — | Follows the I/O points of the system parameter. | — |
| | General intelligent module | — | — | Equivalent to an intelligent module. |

Other modules

■I/O module

Simulation of the operation does not support I/O module.

■Intelligent function module

The buffer memory for an intelligent function module is reserved by the information set in "I/O Assignment Setting" of "System Parameter."

The buffer memory (U□\G) cannot be accessed when the I/O assignment setting is not configured.

By setting an intelligent function module as the module type in the I/O assignment setting, the buffer memory corresponding to the set module is created.

If the module type is not specified, it becomes an empty slot.

If the module type is specified without specifying the number of points, the number of points for the set module will be one specified in "Setting of Points Occupied by Empty Slot" of "System Parameter."

Watchdog timer

If the watchdog timer has been set in a project, the processing time for one instruction will be the fastest one among the ones described in the following:

- Project for an RCP: MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)
- Project for an FX5CPU: MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks)

Attachment of extended SRAM cassette

The simulator operates as if an extended SRAM cassette (8 MB or 16 MB^{*1}) was attached.

A parameter error will occur when specifying the capacity more than 8 MB or 16 MB in "Extended SRAM Cassette Setting" of "CPU Parameter."

*1 The capacity of an extended SRAM cassette differs depending on the types.

- 8MB: RnPCPUs, RnSFCPUs, and RnPSFCPUs
- 16MB: RnCPUs and RnENCPUs

SD memory card

When GX Simulator3 (system simulation) is in RUN, the setting of a virtual SD memory card file cannot be changed.

For details of a virtual SD memory card file, refer to the following:

 Page 562 SD memory card

■File operation instructions

The operation of an SD memory card can be simulated with file operation instructions (SP.FREAD, SP.FWRITE, SP.FDELETE, SP.FCOPY, SP.FMOVE, SP.FRENAME, and SP.FSTATUS) only when a virtual SD memory card file is set in the GX Simulator3 (system simulation) screen.

When a virtual SD memory card file is not set or when a single CPU module is simulated, the operation of an SD memory card cannot be simulated even with file operation instructions.

If an error with code '8000H' occurs when using a file operation instruction, set a virtual SD memory card file in the GX Simulator3 (system simulation) screen.

Drive usage

The data in the ROM drive of a CPU module (program memory/data memory) is stored in a temporary folder in the hard disk of a personal computer.

The ROM drive usage per data depends on the hard disk of a personal computer.

Enabling the remote RESET

In the simulation function, the simulator operates on the assumption that "Enable" is selected in "Remote Reset Setting" of "Operation Related Setting" of "CPU Parameter."

In the multiple CPU system, the CPU, in which the RESET button in the system simulation is enabled, operates as if "Enable" is being set. The CPU, in which the RESET button is disabled, operates as if "Disable" is being set.

Writing parameters to an intelligent function module

When writing parameters on the "Online Data Operation" screen, the availability differs according to the interaction with an intelligent function module.

○: Writable, ×: Not writable, —: Not supported

| Parameter | With interaction | Without interaction |
|------------------------------|------------------|---------------------|
| Simple motion module setting | ○ | × |
| Others | — | × |

Timer, clock function, and system clock

The current value of a timer, clock function, and system clock operate with the actual time.

However, GX Simulator3 operates based on the simulation time when selecting the following menu in the GX Simulator3 (system simulation) screen.

- [Tool] ⇨ [Synchronize Timer with Simulation Time]

The clock on a personal computer is applied to the time of the clock function every time simulation is started or reset.

When the base setting is not set

The following table shows the operations of GX Simulator3 when the model name of a base unit and the number of slots are not set.

| Base setting | | Operation of GX Simulator3 |
|------------------|---------|--|
| Base Module Name | Slots | |
| Not set | Not set | When the number of slots is not set, the system on the simulation operates as if the eight base units in MELSEC iQ-R series, which have eight slots for each, were being set. (R38B × 1 unit, R68B × 7 units) |
| Not set | Set | The system on the simulation operates as if a base unit in MELSEC iQ-R series (R312B or R612B), which has more slots than the set number, were being set for the base unit for which the number of slots is set.*1 |

*1 The slots which exceeds the set number of slots are treated as empty ones.

To use a MELSEC-Q series base unit, set the model name of a base unit and the number of slots.

When the model name of a power supply module is not set

When the model name of a power supply module is not set, the power supply module operates as if R61P was being used on a MELSEC iQ-R series base unit, or Q61P was being used on a MELSEC-Q series base unit.

Errors for the self-diagnostics function

The following self-diagnostics errors are not detected:

- 1900H: Constant scan time error
- 1A00H: Safety cycle time exceeded
- 1A01H: Safety cycle processing error

Error information on module diagnostics

Within errors detected by the simulator, error information which is different from the one that will occur in an actual CPU module may displayed in the module diagnostics screen.

Remote operation screen

Under the following conditions, the operating status (such of a stand-by station) related to a redundant system is not displayed even if the "Remote Operation" screen is opened after a simulation of an RnPSFCPU is started.

- Parameters are not written to GX Simulator3.
- GX Simulator3 is not reset.

Simulation of network modules

■Connection among network modules using cables

The network modules on the network with the same network number operates as all network modules are connected.

■Online operations for another station

Online operations for GX Simulator3 (system simulation) can be performed for the own station only.

■Duplicate station number

If a duplicate station number is detected before data transmission is ready, a duplication error occurs in both stations.

If it is detected when data transmission is ready, a duplication error occurs in the station where the setting is configured later.

■Troubleshooting on network modules

For details on troubleshooting, refer to the following:

📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application)

📖 MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)

📖 MELSEC iQ-R CC-Link IE TSN User's Manual (Application)

📖 MELSEC iQ-F FX5 User's Manual (CC-Link IE)

In a simulation of network modules, some steps in the procedure for troubleshooting that is effective for the actual network modules are not supported.

The following table shows the procedure for troubleshooting and whether each step is supported in a simulation of network modules.

○: Supported, ×: Not supported

| Procedure for troubleshooting | Support status |
|---|----------------|
| 1. Check the LED status. | ○ |
| 2. Check the network status by performing the CC-Link IE TSN/CC-Link IE Field Network diagnostics or CC-Link IE Controller Network diagnostics. | ○ |
| 3. Check the error information by performing module diagnostics for a network module. | × |
| 4. Check the event history by performing module diagnostics for a CPU module.*1 | ○ |
| 5. Check the system monitor and the detailed module information. | × |
| 6. Monitor link special relays (SB) and/or link special registers (SW). | ○ |

*1 Can be checked by performing the following operation.

Select [Diagnostics] ⇒ [Module Diagnostics (CPU Diagnostics)], and click the [Event History] button in the module diagnostics screen.

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Web server

The following shows the considerations when using the web server function during a simulation.

For details on this function, refer to the following:

📖 MELSEC iQ-R/MELSEC iQ-F Web Server Function Guide Book

■Access to a web server

To access a web server, enter the following address in the address bar of the web browser.

`http://localhost:(own station port number)/`

In 'own station port number,' enter the port number displayed in GX Simulator3 (system simulation) screen regardless of the setting of the own station port number of the parameter.

Ex.

When '20111' is displayed in the GX Simulator3 (system simulation) screen, enter 'http://localhost:20111/'



■When the port number cannot be used

When the port number cannot be used because it is duplicated with that of another application or other reasons, the web server cannot be accessed.

■Web browser

The following web browsers can be used.

| Browser | Browser version | |
|-------------------|--------------------|--------------------|
| | MELSEC iQ-R series | MELSEC iQ-F series |
| Internet Explorer | 11 | 11 |
| Microsoft Edge | 41 | 41 |
| Google Chrome | 62.0 | 55.0 |

Precautions

When the LAN setting of Google Chrome is set to use a proxy server, the web server cannot be accessed.

Check the LAN setting and change it so as not to use a proxy server.

■Account

The following table shows the values in the account setting during a simulation.

| Item | Value | |
|------------------------------|----------------------|----------------------|
| | RCPU | FX5CPU |
| User name | User | User |
| Write Device | Enable | Enable |
| Authority for Window Display | Permit Both Displays | Permit Both Displays |
| Update System Web Page | Disable | Not supported |
| Initial Display Window | System Web Page | System Web Page |

■Precautions

GX Simulator3 (system simulation) always runs in the state where a user is logging on to the web server. Therefore, a user cannot log off from the server during a simulation.

■System web page version

The following table shows the system web page version during a simulation.

| Module type | GX Works3 version | System web page version |
|------------------|-------------------------|-------------------------|
| RnCPU RnENCPU | Version 1.050C or later | 1.00 |
| | Version 1.055H or later | 1.01 |
| | Version 1.060N or later | 1.02 |
| | Version 1.065T or later | 1.03 |
| | Version 1.070Y or later | 1.04 |
| | Version 1.075D or later | 1.05 |
| | Version 1.080J or later | 1.07 |
| | Version 1.085P or later | 1.08 |
| | Version 1.090U or later | 1.09 |
| | Version 1.105K or later | 1.11 |
| | Version 1.110Q or later | 1.12 |
| RnPCPU | Version 1.105K or later | 1.01 |

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■Database

A database created in an actual SD memory card and one created in a virtual SD memory card are not compatible with each other. (Even if they are created based on same data, the size of each created database differs.)

To use a database during a simulation, create the database in a virtual SD memory card with GX Simulator3.

For the method for creating a database, refer to the following:

📖 MELSEC iQ-R CPU Module User's Manual (Application)

Operations when an error occurs while these databases are used may differ between a CPU module and GX Simulator3.

Appendix 11 Using Sample Programs

This section shows the method for using sample programs (ladder programs), described in e-Manual, in GX Works3. For the operation method of e-Manual Viewer, refer to e-Manual Viewer Help.

Supported version

To use this function, GX Works3 and e-Manual Viewer of the following versions are required to be installed according to a sample program to be used in GX Works3.

■Ladder program without a function block

- GX Works3: Version 1.035M or later
- e-Manual Viewer: Version 1.13P or later

■Ladder program with a function block

- GX Works3: Version 1.055H or later
- e-Manual Viewer: Version 1.18U or later

Operating procedure

The following shows the operating procedure to use a sample program (ladder program) in GX Works3.

Operating procedure

■Ladder program without a function block

1. Create module labels in a GX Works3 project and set parameters by following the descriptions in e-Manual.
2. Click "Copy a label (for GX Works3)" in e-Manual to copy the global labels or local labels.
3. Set the orders of the following items to be the same:
 - Column items for the labels copied in step 2 (label name, data type, class, assignment (device/label))
 - Column items in a label editor of GX Works3
4. Paste the labels into a global label editor or local label editor in GX Works3.
5. Click "Copy Ladder Program (for GX Works3)" in e-Manual to copy the ladder program.
6. Paste the program into a ladder editor in GX Works3.
7. Convert the program.

■Ladder program with a function block

1. Create module labels in a GX Works3 project and set parameters by following the descriptions in e-Manual.
2. Click "Copy a label (for GX Works3)" in e-Manual to copy the global labels or local labels.
3. Set the orders of the following items to be the same:
 - Column items for the labels copied in step 2 (label name, data type, class, assignment (device/label))
 - Column items in a label editor of GX Works3
4. Paste the labels into a global label editor or local label editor in GX Works3.
5. Click "Copy Ladder Program (for GX Works3)" in e-Manual to copy the ladder program.
6. Paste the program into a ladder editor in GX Works3.

Function blocks in the sample program are changed to undefined function blocks.

Redefine the function block by the following operations.

7. Drag and drop the corresponding function block from the element selection window onto the undefined function block on the ladder editor.
8. Set each item in the "FB Instance Name" screen and click the [OK] button.
9. Convert the program.

Considerations

■When a label name is duplicated

An error occurs at the program conversion when a label name in a sample program and one in a project where the program is pasted are duplicated.

Copy and paste the sample program again by the following operations.

Operating procedure

1. Delete the ladder program pasted into an editor.
2. Change the label name duplicated in a label editor.
3. Paste a sample program into a ladder editor in GX Works3.
4. Change the label name used in the ladder program to the one set in the step 2.

■When an undefined label exists

In the following cases, the module labels in sample programs are pasted as undefined labels.

Check that the latest GX Works3 is installed.

- The versions of module labels differ between the sample program and GX Works3.
- GX Works3 does not support the module labels of the sample program.

■When an incorrect function block is redefined

Check if a redefined function block is the same as the one in a sample program before the program conversion.

If a different function block is redefined by mistake, copy and paste the sample program again by the following operations.

Operating procedure

1. Delete the following data from a project.
 - Ladder program pasted into an editor
 - Redefined function block (including its FB instance)
2. Paste a sample program into a ladder editor in GX Works3.
3. Drag and drop the same function block as the one in the sample program from the element selection window onto the ladder editor.
4. Convert the program.

■When an FB instance name differs from the one in a sample program

When the FB instance name of a redefined function block differs from the one in a sample program, a conversion error may occur.

In that case, change the FB instance name where an error has occurred to the one of the redefined function block.

Appendix 12 USB Driver Installation Procedure

To communicate with a CPU module via USB, installing a USB driver is required.

Operating procedure

1. Connect a personal computer and a CPU module with a USB cable, and turn the power of the programmable controller ON.
2. Right-click "Unknown Device" and click "Update driver" in Windows Device Manager.
3. Select "Browse my computer for drivers" on the "Update Drivers" screen, and specify 'Easysocket\USBDrivers' in the folder where GX Works3 is installed on the next screen.

When an installation folder is not changed at the installation, the installation folder is as follows:

- 64-bit version operating system: C:\Program Files (x86)\MELSOFT\Easysocket\USBDrivers
- 32-bit version operating system: C:\Program Files\MELSOFT\Easysocket\USBDrivers

If multiple MELSOFT products are already installed, specify 'Easysocket\USBDrivers' which is in the folder of the first product installed.


If 'Easysocket\USBDrivers' does not exist, search for 'USBDrivers' in the Windows explorer.

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Appendix 13 Troubleshooting

This section shows the errors which may occur when using GX Works3 and their corrective actions.

| Symptom | Check point | Corrective action |
|--|---|---|
| Contents in the screen are not displayed properly. (For example, overlapping of icons, text overflowing from the frame of a button, etc.) | Is the size of the text and other items in the screen set to a value other than 100% (96 DPI, 9 pt etc.) in Windows settings? | <ul style="list-style-type: none"> Set the value to 100% (96 DPI, 9 pt etc.). For Windows 10 (version 1703 or later) or later^{*1}, the display of GX Works3 can be displayed with high DPI scaling by using a function of the operating system.^{*2} <ol style="list-style-type: none"> Select and right-click 'GXW3.exe'^{*3}, then select [Properties] from the shortcut menu. Click the [Change high DPI settings] button in the [Compatibility] tab. Select the checkbox of "Override high DPI scaling behavior. Scaling performed by:", then select "System" from the pull-down list. Click the [OK] button. |
| Timeout occurs while GX Works3 is accessing to a built-in Ethernet CPU in Ethernet. | Is communication with GX Works3 allowed when Windows Firewall is enabled? | <p>For details, refer to the following:</p> <p> Page 581 When communication with GX Works3 is not allowed by the Windows firewall</p> |

*1 The Windows version can be checked by the following procedure.

- Enter "winver" in the search box of Windows, and select it from the menu.
- Check the version in the displayed screen.

*2 The display of GX Works3 will be blurred by enlarging.

The following lists the setting values for "Change the size of text, apps, and other items" and the recommended display resolution for each setting value in Windows 10 or later.

Setting value: 100%, display resolution: 1024 × 768 dots or more

Setting value: 125%, display resolution: 1900 × 1200 dots or more

Setting value: 150%, display resolution: 1900 × 1200 dots or more

Setting value: 175%, display resolution: 2880 × 1620 dots or more

Setting value: 200%, display resolution: 2880 × 1620 dots or more

Setting value: 225%, display resolution: 3840 × 2160 dots or more

Setting value: 250%, display resolution: 3840 × 2160 dots or more

*3 'GXW3.exe' is stored in the folder where GX Works3 has been installed.

The following is an example of the storage location.

64-bit version operating system: C:\Program Files (x86)\MELSOFT\GPPW3\GXW3.exe

32-bit version operating system: C:\Program Files\MELSOFT\GPPW3\GXW3.exe

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Appendix 14 Differences from Existing MELSOFT Applications

This section shows the differences between GX Works3 version 1.110Q and GX Works2 version 1.622Y.

For details on the functions and option settings of GX Works2, refer to the following:

 GX Works2 Version 1 Operating Manual (Common)

 GX Works2 Version 1 Operating Manual (Simple Project)

 GX Works2 Version 1 Operating Manual (Structured Project)

For the differences with PX Developer, refer to the following:

 Differences of PX Developer and GX Works3 process control functions(FA-A-0236)

For details on the functions and option settings of PX Developer, refer to the following:

 PX Developer Version 1 Operating Manual (Programming Tool)

 PX Developer Version 1 Operating Manual (Monitor Tool)

Differences of functions

This section explains the differences of functions from ones of GX Works2.

List of GX Works2 functions

| Function | Reference |
|--|--|
| Common function | Page 1053 Common function |
| Label | Page 1060 Label |
| Device comment | Page 1061 Device comment |
| Device memory | Page 1062 Device memory |
| Verification result | Page 1063 Verification result |
| Sampling trace | Page 1063 Sampling trace |
| Ladder editor | Page 1064 Ladder editor |
| SFC diagram | Page 1068 SFC diagram |
| SFC block list | Page 1069 SFC block list |
| ST editor | Page 1070 ST editor |
| Structured Ladder/FBD editor | Page 1071 Structured Ladder/FBD editor |
| CC IE Field configuration window | Page 1073 CC IE Field configuration window |
| CC-Link configuration window | Page 1074 CC-Link configuration window |
| AnyWireASLINK configuration window | Page 1075 AnyWireASLINK configuration window |
| Ethernet configuration window | Page 1076 Ethernet configuration window |
| CC-Link IEF Basic configuration window | Page 1077 CC-Link IEF Basic configuration window |
| Sensor/device monitor screen | Page 1078 Sensor/device monitor screen |
| GX Simulator2 screen | Page 1079 GX Simulator2 screen |
| Predefined protocol support | Page 1080 Predefined protocol support |

Common function

These functions can always be used regardless of the editing or setting target.

■Project

○: Similar function supported, ×: Similar function not supported


| GX Works2 | | | GX Works3 | |
|------------------------------------|--|----------------------------------|------------------|---|
| | | | Supported or not | Reference/similar function |
| New | | | ○ | Page 105 Creating a project |
| Open | | | ○ | Page 107 Opening a project |
| Close | | | ○ | • [Project] ⇨ [Close] |
| Save | | | ○ | Page 130 Overwriting projects |
| Save As | | | ○ | Page 129 Saving projects under the specified name |
| Compress/Unpack | Compress | | ○ | Page 145 Compressing a project file |
| | Unpack | | × | |
| Delete | | | ○ | Page 130 Deleting a project |
| Verify | | | ○ | Page 151 Verifying Projects |
| Project Revision | Revision Entry | | ○ | Page 168 Registering a revision |
| | Revision List | | ○ | Page 170 Revision list screen |
| Change PLC Type | | | ○ | Page 147 Changing the Module Type and Operation Mode of Projects |
| Change Project Type | | | × | |
| Object | New | | ○ | Page 132 Creating data |
| | Rename | | ○ | Page 133 Changing a data name |
| | Delete | | ○ | Page 136 Deleting data |
| | Copy | | ○ | Page 133 Copying and pasting data |
| | Paste | | ○ | |
| | Set as Default Connection | | ○ | Page 578 Switching connection destinations |
| | Property | | ○ | Page 143 Properties |
| Intelligent Function Module | New Module | | ○ | Page 214 Setting parameters of modules |
| | Delete Module | | ○ | Page 136 Deleting data |
| | Property | | ○ | Page 143 Properties |
| | Save the Positioning Module Data | | × | |
| | Read from the Positioning Module Data | | × | |
| | Save GX Configurator-QP Data | | × | |
| | Import GX Configurator-QP Data | | × | |
| | Intelligent Function Module Parameter List | | ○ | Page 222 Checking/changing the number of intelligent function module parameters |
| | Save/Read FX Special Module Data | Read new FX Special Module Data | × | |
| | | Save FX Special Module Data | × | |
| | | Read from FX Special Module Data | × | |
| Open Other Data | Open Other Project | | ○ | Page 110 Opening a GX Works2 format project Page 113 Opening a PX Developer format project Page 127 Opening a GX Developer format project |
| | Open Other Data | Read ASC Format File | ○ | Page 118 Opening a GX IEC Developer format project |
| Export to GX Developer Format File | | | × | |

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| GX Works2 | | GX Works3 | |
|------------------------------|--------------------------------|------------------|--|
| | | Supported or not | Reference/similar function |
| Library | Create | ○ | Page 528 Creating a library file |
| | Install | ○ | Page 532 Registering user libraries in the library list |
| | Export FB to Library (Project) | × ^{*1} | |
| | Deinstall | ○ | Page 532 Deleting libraries/updating display information |
| | Reload | ○ | |
| | Rename | × ^{*2} | |
| | Open | ○ | Page 528 Creating a library file |
| | Close | ○ | |
| | Change Password | ○ | |
| | Save As | ○ | |
| | Save | ○ | |
| | Help | ○ | Page 532 Displaying Help |
| Security | Change Password | ○ | Page 708 Changing a password of the logon user It is available only in projects for an RnSFCPU and an RnPSFCPU. |
| | User Management | ○ | Page 709 User management It is available only in projects for an RnSFCPU and an RnPSFCPU. |
| | Data Security Setting | × | |
| | Soft Security Key Management | ○ | Page 699 Creating/deleting a security key |
| Print | | ○ | Page 93 Printing Data |
| Print Preview | | ○ | Page 93 Printing Data |
| Print Window | | × | |
| Print Window Preview | | × | |
| Printer Setup | | ○ | Page 93 Printing Data |
| (Recently used files 1 to 4) | | ○ | • [Project] ⇨ [Recent Projects] ⇨ [(project path used recently 1 to 10)] |
| Start GX Developer | | ○ | • [Project] ⇨ [Start GX Works2] |
| Exit | | ○ | Page 48 End |

*1 In GX Works3, function blocks cannot be exported directly to a project.

To import FB elements, which were exported to a library file, in a project, refer to the following:

 Page 531 Enhanced use of libraries

*2 An arbitrary name can be set to a library file to be exported.

However, the file name of an imported library file cannot be changed.

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------|--|------------------|--------------------|
| | | Supported or not | Similar function |
| Undo | | ○ | • [Edit] ⇨ [Undo] |
| Redo | | ○ | • [Edit] ⇨ [Redo] |
| Cut | | ○ | • [Edit] ⇨ [Cut] |
| Copy | | ○ | • [Edit] ⇨ [Copy] |
| Paste | | ○ | • [Edit] ⇨ [Paste] |

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|----------------------------------|------------------|---|
| | Supported or not | Reference/similar function |
| Cross Reference | ○ | Page 472 Displaying cross reference information |
| Device List | ○ | Page 480 Displaying Device Usage |
| Find Device | ○ | Page 463 Searching for/Replacing Devices and Labels |
| Find Instruction | ○ | Page 465 Searching for/Replacing Instructions |
| Find Contact or Coil | ○ | |
| Find String | ○ | Page 466 Searching for/Replacing Character Strings |
| Replace Device | ○ | Page 463 Searching for/Replacing Devices and Labels |
| Replace Instruction | ○ | Page 465 Searching for/Replacing Instructions |
| Replace String | ○ | Page 466 Searching for/Replacing Character Strings |
| Change Open/Close Contact | ○ | Page 468 Changing Contacts between Open Contact and Close Contact |
| Device Batch Replace | ○ | Page 469 Batch Replacing of Devices and Labels |
| Register to Device Batch Replace | ○ | • [Find/Replace] ⇔ [Register to Device Batch Replace] |

■Convert/Compile

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|-----------------------|------------------|---|
| | Supported or not | Reference/similar function |
| Build | ○ | Page 432 Converting any or all programs |
| Online Program Change | ○ | Page 620 Online program change |
| Rebuild All | ○ | Page 432 Converting any or all programs |

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■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | | GX Works3 | |
|--|--------------------------------------|----------------|------------------|--|
| | | | Supported or not | Reference/similar function |
| Toolbar | Toolbar name | | ○ | Page 50 Main frame |
| | Display All | | × | |
| Statusbar | | | ○ | Page 50 Main frame |
| Color and Font | | | ○ | Page 82 Checking and Changing Colors and Fonts |
| Docking Window | Navigation | | ○ | Page 53 Navigation window |
| | Element Selection | | ○ | Page 58 Element selection window |
| | Output | | ○ | • [View] ⇒ [Docking Window] ⇒ [Output] |
| | Cross Reference | | ○ | Page 472 Displaying cross reference information |
| | Device List | | ○ | Page 480 Displaying Device Usage |
| | Device Reference (CC-Link) | | ○ | Page 219 Checking refresh devices assigned to a module |
| | Device Reference (AnyWireASLINK) | | × | |
| | Watch 1 to 4 | | ○ | Page 658 Checking Current Values by Registering Devices/Labels |
| | Intelligent Function Module Monitor | Module 1 to 10 | ○ | Page 680 Checking Current Values in an Intelligent Function Module |
| | Intelligent Function Module Guidance | | × | |
| | Find/Replace | | ○ | • [View] ⇒ [Docking Window] ⇒ [Find/Replace] |
| | Debug | Break Point | | × |
| | | Break Device | | × |
| | | Skip Range | | × |
| Reset the Window Position to its Default | | | ○ | Page 50 Displaying docked windows |

■Online


○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-------------------------------|--------------------|------------------|---|
| | | Supported or not | Reference/similar function |
| Read from PLC | | ○ | Page 597 Writing/Reading Programmable Controller Data |
| Write to PLC | | ○ | |
| Verify with PLC | | ○ | Page 615 Verifying Programmable Controller Data |
| Remote Operation | | ○ | Page 789 Remote Operation |
| Redundant Operation | | ○ | Page 791 Redundant Programmable Controller Operations |
| Password/Keyword | New | ○ | Page 720 Setting a file password |
| | Delete | ○ | |
| | Disable | ○ | |
| Soft Security Key Management | | ○ | Page 702 Registering a security key in a program file |
| PLC Memory Operation | Format PLC Memory | ○ | Page 799 Checking Memory Usage |
| | Clear PLC Memory | ○ | |
| | Arrange PLC Memory | × | |
| Delete PLC Data | | ○ | Page 597 Writing/Reading Programmable Controller Data |
| PLC User Data | Read | ○ | Page 627 Reading/Writing/Deleting User Data |
| | Write | ○ | |
| | Delete | ○ | |
| Export to ROM Format | | × | |
| Program Memory Batch Download | | × | |
| Latch Data Backup | Backup | × ^{*1} | |
| | Delete Backup Data | × ^{*1} | |

| GX Works2 | | GX Works3 | |
|-------------------------------------|-----------------------------------|------------------|---|
| | | Supported or not | Reference/similar function |
| PLC Module Change | Create Backup Data | ×*2 | |
| | Restore | ×*2 | |
| Set Clock | | ○ | Page 788 Clock Setting in a CPU Module |
| Register/Cancel Display Module Menu | | × | |
| Monitor | Monitor Mode | ○ | Page 280 Switching the ladder edit mode (read/write/monitor read/monitor write) |
| | Monitor (Write Mode) | ○ | |
| | Start Monitoring (All Windows) | ○ | Page 633 Starting/stopping monitoring |
| | Stop Monitoring (All Windows) | ○ | |
| | Start Monitoring | ○ | |
| | Stop Monitoring | ○ | |
| | Change Value Format (Decimal) | ○ | Page 633 Changing display format of word devices |
| | Change Value Format (Hexadecimal) | ○ | |
| | Device/Buffer Memory Batch | ○ | Page 654 Checking Device/Buffer Memory in a Batch |
| | Program List | ○ | Page 677 Checking the Processing Time of a Program |
| | Interrupt Program List | ○ | Page 679 Checking Execution Counts of Interrupt Programs |
| | Change Instance (Function Block) | × | |
| | SFC All Block Batch Monitoring | ○ | Page 653 Monitoring all SFC blocks in batch/active steps |
| | SFC Auto Scroll | ○ | Page 650 Monitoring with the SFC auto-scroll |
| Watch | Start Watching | ○ | Page 658 Checking Current Values by Registering Devices/Labels |
| | Stop Watching | ○ | |
| | Insert Next Object | × | |
| | Display Format of Bit Device | Number Display | × |
| | | ON/OFF Display | × |
| | | Symbol Display | × |
| | Register to Watch | ○ | Page 658 Checking Current Values by Registering Devices/Labels |
| Local Device Batch Read + Save CSV | | × | |


*1 A function of RnCPUs.

For details, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

*2 A function of RnPCPUs.

For details, refer to the following:

 MELSEC iQ-R CPU Module User's Manual (Application)

■Debug

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---|----------------------------|------------------|--|
| | | Supported or not | Reference/similar function |
| Start/Stop Simulation | | ○ | Page 542 Simulation |
| Instructions Unsupported by Simulation | | × | |
| Modify Value | | ○ | Page 632 Changing current values |
| Forced Input Output Registration/Cancellation | | ○ | Page 666 Turning Input/Output Devices ON/OFF Forcibly |
| Device Test with Execution Condition | Register | ○ | Page 668 Changing Device/Label Value by Setting Conditions |
| | Registration Check/Disable | ○ | |
| | Batch Disable | ○ | |
| Sampling trace | Open Sampling Trace | × ^{*1} | |
| Scan Time Measurement | | ○ | Page 675 Measuring the Scan Time of a Program |
| Step Execution | Stop | × | |
| | Cancel | × | |
| | Break Execution | × | |
| | Step Execution | × | |
| | Execution Option | × | |
| Break Setting | Set/Cancel Break Point | × | |
| | Enable/Disable Break Point | × | |
| | Cancel All Break Points | × | |
| | Break Point Window | × | |
| | Cancel All Break Devices | × | |
| | Break Device Window | × | |
| Skip Setting | Set/Cancel Skip Range | × | |
| | Enable/Disable Skip Range | × | |
| | Cancel All Skip Ranges | × | |
| | Skip Range Window | × | |

*1 GX Works3 does not have a similar function. Use the following functions instead.
 Data logging function (CPU Module Logging Configuration Tool)
 Realtime monitor function (GX LogViewer)

■Diagnostics

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-------------------------------|--|------------------|--|
| | | Supported or not | Reference/similar function |
| PLC Diagnostics | | ○ | Page 733 Module Diagnostics |
| Ethernet Diagnostics | | ○ | Page 739 Ethernet diagnostics |
| CC IE Control Diagnostics | | ○ | Page 740 CC-Link IE Controller Network diagnostics |
| CC IE Field Diagnostics | | ○ | Page 742 CC-Link IE TSN/CC-Link IE Field Network diagnostics |
| CC-Link IEF Basic Diagnostics | | ○ | Page 744 CC-Link IE Field Network Basic diagnostics |
| MELSECNET Diagnostics | | ○ | Page 745 MELSECNET diagnostics |
| CC-Link Diagnostics | | ○ | Page 746 CC-Link diagnostics |
| Sensor/Device Monitor | | ○ | Page 730 Sensor/Device Status Check |
| System Monitor | | ○ | Page 727 Module Status Check of a System |
| Online Module Change | | × | |

■Tool

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---|---|------------------|--|
| | | Supported or not | Reference/similar function |
| IC Memory Card | Read IC Memory Card | ○ | Page 630 Writing to/Reading from a memory card |
| | Write IC Memory Card | ○ | |
| | Read from IC Memory Card (Edit and Data Copy) | × | |
| | Write to IC Memory Card (Edit and Data Copy) | × | |
| Check Program | | ○ | Page 429 Program check |
| Check Parameter | | ○ | Page 210 Checking parameters |
| Clear All Parameters | | × | |
| Check Device Duplication of Global Label | | ○ | Page 251 Checking assigned devices |
| Device/Label Automatic-Assign Setting | | × | |
| Block Password | | ○ | Page 695 Setting a block password |
| Confirm Memory Size | | ○ | Page 446 Calculating Memory Size |
| Delete Unused Device Comment | | ○ | Page 417 Deleting unused device comments |
| Merge Data | | × | |
| Set TEL Data/Connect via Modem | Line Connection | × | |
| | Line Disconnection | × | |
| | AT Command Registration | × | |
| | Phone Book | × | |
| | Options | × | |
| Logging Configuration Tool | | ○ | Page 756 Data Logging Function |
| Real-time Monitor Function | | ○ | Page 683 Checking Current Logging Data |
| Ethernet Adapter Module Configuration Tool | | × | |
| Built-in I/O Module Tool | Positioning Monitor | × | |
| | High-Speed Counter Monitor | × | |
| | I/O Monitor | × | |
| Check Intelligent Function Module Parameter | Check Auto Refresh Duplication | ○ | Page 210 Checking parameters |
| Intelligent Function Module Tool | | ○ | Page 226 Displaying the module tool list |
| Predefined Protocol Support Function | | ○ | Page 228 Predefined Protocol Support Function |
| Language Selection | | ×*1 | |
| Profile Management | Register | ○ | Page 194 Managing Profiles |
| | Delete | ○ | |
| Key Customize | | ○ | Page 81 Checking and Changing Shortcut Keys |
| Options | | ○ | Page 85 Option Settings for Each Function |

*1 GX Works3 supports multiple languages, and therefore the display language such as one on the menu can be switched on a personal computer.

For details, refer to the section.

📖 Page 49 Display Language Switching

A

■Window

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|--------------------------|------------------|---|
| | Supported or not | Reference/similar function |
| Cascade | ○ | • [Window] ⇒ [Cascade] |
| Tile Vertically | ○ | • [Window] ⇒ [Tile Vertically] |
| Tile Horizontally | ○ | • [Window] ⇒ [Tile Horizontally] |
| Arrange Icons | ○ | • [Window] ⇒ [Arrange Icons] |
| Close All | ○ | • [Window] ⇒ [Close All Windows] |
| (Switch to other window) | ○ | • [Window] ⇒ [(Window information being displayed)] |
| Other Window | ○ | Page 51 Arranging work windows |

■Help

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|---|------------------|---|
| | Supported or not | Reference/similar function |
| GX Works2 Help | ○ | Page 42 Displaying Help |
| Connection to MITSUBISHI ELECTRIC FA Global Website | ○ | Page 43 Connecting to MITSUBISHI ELECTRIC FA Global Website |
| About | ○ | Page 43 Checking the version of GX Works3 |

Label

The following table shows the functions available for setting and editing labels.

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|--------------------------|--|------------------|--|
| | | Supported or not | Reference/similar function |
| Delete | | ○ | — |
| Select All | | ○ | |
| New Declaration (Before) | | ○ | Page 237 Editing a row |
| New Declaration (After) | | ○ | |
| Delete Row | | ○ | |
| Read from CSV File | | ○ | Page 255 Exporting/importing a label |
| Write to CSV File | | ○ | |
| System Label | Reservation to Register System Label | ○ | Page 266 Registering labels in system label database |
| | Reservation to Release System Label | ○ | Page 266 Releasing system labels |
| | Import System Label | ○ | Page 266 Importing system labels in system label database to GX Works3 |
| | Reflect to System Label Database | ○ | Page 266 Registering labels in system label database |
| | Check the changes of the System Label Database | ○ | Page 267 Importing the changes of system label database |
| | Execute Verification Synchronous with System Label | ○ | Page 267 Verifying system label information |
| Sort | | ○ | Page 237 Sorting labels |
| Unused label list | | ○ | Page 478 Displaying a list of unused labels |

Device comment

The following table shows the functions available for editing device comments.

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|--|--|------------------|---|
| | | Supported or not | Reference/similar function |
| Delete | | ○ | — |
| Select All | | ○ | |
| Import from Sample Comment | | ○ | Page 420 Reading sample comments |
| Clear All (All Devices) | | ○ | Page 417 Clearing all device comments |
| Clear All (All Displayed Devices) | | ○ | |
| Read from CSV File | | ○ | Page 418 Exporting/importing device comments |
| Write to CSV File | | ○ | |
| Hide Bit Specification Information | | ○ | • [Edit] ⇒ [Hide All Bit Specification Information] |
| Show Bit Specification Information | | ○ | • [Edit] ⇒ [Show All Bit Specification Information] |
| Cut The Range including Hidden Bit Specification Information | | ○ | Page 415 Creating device comments |
| Copy The Range including Hidden Bit Specification Information | | ○ | |
| Paste The Range including Hidden Bit Specification Information | | ○ | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------|---------|------------------|--------------------------------|
| | | Supported or not | Reference/similar function |
| Text Size | Bigger | ○ | • [View] ⇒ [Zoom] ⇒ [Zoom In] |
| | Smaller | ○ | • [View] ⇒ [Zoom] ⇒ [Zoom Out] |

A

Device memory

The following table shows the functions available for setting the device memory.

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|--------------|------------------|------------------------------------|
| | Supported or not | Reference/similar function |
| Delete | ○ | — |
| Insert Row | × | |
| Input Device | × | |
| Paste Text | ○ | Page 452 Setting character strings |
| FILL | ○ | Page 451 Setting values in batch |

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|------------------|------------------|--|
| | Supported or not | |
| Find Device Cell | × | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|--------------|------------------|--|
| | Supported or not | Reference/similar function |
| Display Mode | ○ | • [View] ⇒ [Display Format Detailed Setting] |
| Register | ○ | • [View] ⇒ [Display Format Detailed Setting] |
| Setup | × | |

■Tool

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|-----------------------------|------------------|--|
| | Supported or not | Reference/similar function |
| Read Device Memory from PLC | ○ | Page 453 Writing/Reading Data to/from CPU Module |
| Write Device Memory to PLC | ○ | |
| Read from Excel File | ○ | Page 454 Exporting/Importing Device Memory Data |
| Write to Excel File | ○ | Page 454 Exporting/Importing Device Memory Data |

Verification result

The following table shows the functions available while a verification result is displayed.

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|-------------------|------------------|---|
| | Supported or not | Reference/similar function |
| Write to CSV File | ○ | Page 153 Checking a verification result |

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|------------------|------------------|---|
| | Supported or not | Reference/similar function |
| Next Unmatch | ○ | Page 153 Checking a verification result |
| Previous Unmatch | ○ | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|-------------------------|------------------|--|
| | Supported or not | Reference/similar function |
| Return to Result List | ○ | • [View] ⇒ [Return to Result List] |
| Close Detail Result | ○ | • [View] ⇒ [Close Detailed Result] |
| Close All Detail Result | ○ | • [View] ⇒ [Close All Detailed Result] |

Sampling trace

GX Works3 does not have a similar function. Use the following functions instead.

| Function | Reference |
|------------------|--|
| Data logging | 📖 MELSEC iQ-R CPU Module User's Manual (Application) |
| Realtime monitor | 📖 GX LogViewer Version 1 Operating Manual |

A

Ladder editor







The following table shows the functions available for editing data in a ladder editor.


■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | | GX Works3 | | |
|---------------------------------|-----------------------------------|----------------------------|------------------|---|--|
| | | | Supported or not | Reference/similar function | |
| Continuous Paste | | | ○ | Page 302 Pasting device numbers or label names consecutively | |
| Delete | | | ○ | — | |
| Restore After Ladder Conversion | | | ○ | Page 303 Returning ladder diagrams to the condition before editing | |
| Insert Row | | | ○ | • [Edit] ⇨ [Insert Row]/[Delete Row]/[Insert Column]/[Delete Column] | |
| Delete Row | | | ○ | | |
| Insert Column | | | ○ | | |
| Delete Column | | | ○ | | |
| NOP Batch Insert | | | ○ | | |
| NOP Batch Delete | | | ○ | Page 300 Inserting/deleting NOP instruction | |
| Edit Line | | | ×*1 | | |
| Delete Line | | | ×*1 | | |
| Change TC Setting | | | ○ | Page 300 Changing TC setting values | |
| Ladder Edit Mode | Read Mode | | ○ | Page 280 Switching the ladder edit mode (read/write/monitor read/monitor write) | |
| | Write Mode | | ○ | | |
| | Read Mode (All Windows) | | ○ | | |
| | Write Mode (All Windows) | | ○ | | |
| Ladder Symbol | Open Contact | | ○ | Page 281 Entering ladders | |
| | Close Contact | | ○ | | |
| | Open Branch | | ○ | | |
| | Close Branch | | ○ | | |
| | Coil | | ○ | | |
| | Application Instruction | | ○ | | |
| | Vertical Line | | ○ | | |
| | Horizontal Line | | ○ | | |
| | Delete Vertical Line | | ○ | | |
| | Delete Horizontal Line | | ○ | | |
| | Pulse Contact Symbol | Rising Pulse | ○ | | |
| | | Falling Pulse | ○ | | |
| | | Rising Pulse Branch | ○ | | |
| | | Falling Pulse Branch | ○ | | |
| | | Rising Pulse Close | ○ | | |
| | | Falling Pulse Close | ○ | | |
| | | Rising Pulse Close Branch | ○ | | |
| | | Falling Pulse Close Branch | ○ | | |
| | Invert Operation Results | | ○ | | • [Edit] ⇨ [Ladder Symbol] ⇨ [Invert Operation Results]/[Operation Result Rising Pulse]/[Operation Result Falling Pulse] |
| | Operation Result Rising Pulse | | ○ | | |
| Operation Result Falling Pulse | | ○ | | | |
| Inline Structured Text | Insert Inline Structured Text Box | | ○ | Page 292 Inserting an inline structured text box | |
| | Display Template | | ○ | Page 326 Displaying syntax templates | |
| | Mark Template (Left) | | ○ | | |
| | Mark Template (Right) | | ○ | | |
| Edit FB Instance | | | ○ | Page 285 Changing an FB instance name | |

| GX Works2 | | GX Works3 | |
|--------------------|-----------------------------------|------------------|--|
| | | Supported or not | Reference/similar function |
| Documentation | Device Comment | ○ | Page 295 Entering/editing comments |
| | Statement | ○ | Page 296 Entering/editing statements |
| | Note | ○ | Page 299 Entering/editing notes |
| | Statement/Note Batch Edit | ○ | Page 296 Entering/editing statements Page 299 Entering/editing notes |
| Easy Edit | Connect Line to Right-Side Symbol | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Connect Horizontal Line to Right-Side Ladder Symbol] |
| | Connect Line to Left-Side Symbol | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Connect Horizontal Line to Left-Side Ladder Symbol] |
| | Enter/Delete HLine Rightward | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Enter/Delete Horizontal Line to Rightward] |
| | Enter/Delete HLine Leftward | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Enter/Delete Horizontal Line to Leftward] |
| | Enter/Delete VLine Downward | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Enter/Delete Vertical Line to Downward] |
| | Enter/Delete VLine Upward | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Enter/Delete Vertical Line to Upward] |
| | Switch Open/Close Contact | ○ | Page 282 Switching methods for contacts/instructions |
| | Switch Statement/Note Type | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Switch Statement/Note Type] |
| | Instruction Partial Edit | ○ | • [Edit] ⇨ [Easy Edit] ⇨ [Instruction Partial Edit] |
| | Edit List for Ladder Block | × *2 | |
| Read from CSV File | | ○ | Page 309 Importing from a CSV file |
| Write to CSV File | | ○ | Page 312 Exporting to a CSV file |

*1 In GX Works3, a line can be drawn with the shortcut keys ( +  /  /  / ) ( Page 283 Drawing a line)

*2 Program blocks can be listed in the "Converted Result" window. ( Page 444 Displaying a converted result)

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|-------------------------------------|------------------|--|
| | Supported or not | Reference/similar function |
| Change Module I/O No. | × | |
| Switch Statement/Note Type | × | |
| Line Statement List | ○ | Page 297 Displaying a list |
| Jump | ○ | Page 307 Jump |
| Jump to Next Ladder Block Start | ○ | • [Find/Replace] ⇨ [Jump to Next Ladder Block Start] |
| Jump to Previous Ladder Block Start | ○ | • [Find/Replace] ⇨ [Jump to Previous Ladder Block Start] |
| Next Device | × | |
| Next Contact | × | |
| Next Coil | × | |
| Back | ○ | • [Find/Replace] ⇨ [Previous]/[Next] |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|--|------------------------------|------------------|---|
| | | Supported or not | Reference/similar function |
| Comment | | ○ | Page 295 Entering/editing comments |
| Statement | | ○ | Page 296 Entering/editing statements |
| Note | | ○ | Page 299 Entering/editing notes |
| Display Lines of Monitored Current Value | | ○ | • [View] ⇒ [Display Lines of Monitored Current Value] |
| Display Format for Device Comment | | ○ | • [View] ⇒ [Display Format for Device Comment] |
| Display Ladder Block | Hide Ladder Block | × ^{*1} | |
| | Display Ladder Block | × ^{*1} | |
| | Hide All Ladder Block | × ^{*1} | |
| | Display All Ladder Block | × ^{*1} | |
| Device Display | Device Display | × | |
| | Batch Device Display | ○ | Page 276 Configuration of a ladder editor |
| | Cancel All Device Display | ○ | |
| Display Compile Result | | ○ | Page 444 Displaying a converted result |
| Zoom | | ○ | • [View] ⇒ [Zoom] ⇒ [Set Zoom Factor]/[Zoom In]/[Zoom Out]/[Fit the editor width to the window width] |
| Text Size | Bigger | ○ | Page 82 Checking and Changing Colors and Fonts The character size can be changed for each editor by using the following menu. • [View] ⇒ [Text Size] ⇒ [Bigger]/[Smaller] |
| | Smaller | ○ | |
| Open Other Window | Open Reference Window | × ^{*2} | |
| | Update Reference Window | × ^{*2} | |
| | Open Reference Source Window | × ^{*2} | |
| | Tile FB Horizontally | ○ | • [View] ⇒ [Open Program Body of Selected Element] ⇒ [Tile Horizontally] |
| | Open Label Setting | ○ | • [View] ⇒ [Open Label Setting] ⇒ [Open in Front] |
| | Open Zoom SFC Block | ○ | Page 381 Creating/displaying Zooms (action/transition) |
| Move SFC Cursor | Up | × | |
| | Down | × | |
| | Left | × | |
| | Right | × | |
| Open Instruction Help | | ○ | Page 307 Displaying instruction help |
| ST Monochrome Display | | × | |

*1 The display status of ladder blocks in a ladder editor can be changed by using the following menu.
[View] ⇒ [Outline] ⇒ [Expand/Collapse of Outlines]/[Expand/Collapse of All Outlines]/[Show/Hide of Outlines]

*2 By splitting a ladder editor vertically, ladder blocks which are described in different parts can be edited and monitored at once.
For details, refer to the following:

📖 Page 279 Splitting a ladder editor

■Online

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------|--------------------------------|------------------|--|
| | | Supported or not | |
| Monitor | Monitor Condition Setting | × | |
| | Monitor Stop Condition Setting | × | |
| | Entry Ladder Monitor | × | |
| | Delete All Entry Ladder | × | |


A

SFC diagram

The following table shows the functions available for editing SFC diagrams.

By comparing with GX Works2, the functions are enhanced and their operability have been improved.

For the editing method, refer to the following:

 Page 353 Creating an SFC Program

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|--------------------|---|------------------|---|
| | | Supported or not | Reference/similar function |
| Delete | | ○ | — |
| Arrange SFC | | × | |
| Change TC Setting | | ○ | Page 300 Changing TC setting values |
| Ladder Edit Mode | Read Mode | × | |
| | Write Mode | × | |
| | Read Mode (All Windows) | × | |
| | Write Mode (All Windows) | × | |
| SFC Step Attribute | No Attribute | ○ | Page 362 Changing a step name/step No./step attribute/step attribute target |
| | Stored Coil | ○ | |
| | Stored Operation (without Transition Check) | ○ | |
| | Stored Operation (with Transition Check) | ○ | |
| | Reset | ○ | |
| Sort SFC Step No. | | × | |
| Documentation | SFC Step/Transition Comment | × | |

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---------------------|--|------------------|--|
| | | Supported or not | |
| Jump | | × | |
| Find Jump Step | | × | |
| Change SFC Step No. | | × | |

■Convert/Compile

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---------------|--|------------------|-----------------------------|
| | | Supported or not | Reference/similar function |
| Convert Block | | ○ | Page 380 Converting a block |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------------|---------|------------------|--|
| | | Supported or not | Reference/similar function |
| Program Display | | × | |
| SFC Step/Transition Comment | | ○ | Page 354 Configuration of an SFC diagram editor |
| Zoom | | ○ | • [View] ⇨ [Zoom] ⇨ [Set Zoom Factor]/[Zoom In]/[Zoom Out] |
| Text Size | Bigger | × | |
| | Smaller | × | |
| SFC Column Setting | | × | |

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Reference/similar function |
| Open SFC Blocklist | ○ | Page 384 Displaying an SFC block list |
| MELSAP3 Display | ○ | Page 358 Display format of action/transition |
| MELSAP-L (Instruction Format) Display | ○ | |
| MELSAP-L (Start Conditions Format) Display | × | |
| Open Zoom/Start Destination Block | ○ | Page 354 Configuration of an SFC diagram editor |
| Back to Start SFC Block | ○ | Page 363 Creating a step that makes another block activated |
| Open Header | ○ | Page 385 Displaying local label editor |
| Reset the Window Position to its Default | × | |

■Online

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------|--------------------------------|------------------|--|
| | | Supported or not | |
| Monitor | Monitor Condition Setting | × | |
| | Monitor Stop Condition Setting | × | |

SFC block list

The following table shows the functions available for editing the SFC block list.

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|-------------------------------|------------------|--|
| | Supported or not | Reference/similar function |
| Jump | ○ | Page 385 Jump |
| Find Block No. | × | |
| Block Information Find Device | ○ | Page 385 Searching for block information |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|------------------------|------------------|--|
| | Supported or not | Reference/similar function |
| SFC Block List Comment | ○ | Page 384 Displaying an SFC block list |
| Device Display | ○ | |
| Open SFC Body | ○ | Page 384 Displaying SFC diagrams |
| Open Header | ○ | Page 385 Displaying local label editor |

A

ST editor

The following table shows the functions available for editing data in an ST editor.

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------|--|------------------|--------------------------------------|
| | | Supported or not | Reference/similar function |
| Delete | | ○ | — |
| List Operands | | × | |
| Display Template | | ○ | Page 326 Displaying syntax templates |
| Mark Template (Left) | | ○ | |
| Mark Template (Right) | | ○ | |

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------|----------------------|------------------|---------------------------------|
| | | Supported or not | Reference/similar function |
| Jump | | ○ | Page 328 Jump |
| Bookmark | Toggle Bookmark | ○ | Page 500 Registering a Bookmark |
| | Bookmark List | ○ | |
| | Next Bookmark | ○ | |
| | Previous Bookmark | ○ | |
| | Delete All Bookmarks | ○ | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|------------------------|-----------------|------------------|---|
| | | Supported or not | Reference/similar function |
| Display Compile Result | | × | |
| Zoom | Set Zoom Factor | ○ | • [View] ⇒ [Zoom] ⇒ [Set Zoom Factor] |
| | Increase Zoom | ○ | • [View] ⇒ [Zoom] ⇒ [Zoom In] |
| | Decrease Zoom | ○ | • [View] ⇒ [Zoom] ⇒ [Zoom Out] |
| Zoom Header/Body | Header | ○ | • [View] ⇒ [Open Label Setting of Selected Element] ⇒ [Open in Front] |
| | Body | ○ | • [View] ⇒ [Open Program of Selected Element] ⇒ [Open in Front] |
| Open Header | | ○ | • [View] ⇒ [Open Label Setting] ⇒ [Open in Front] |
| ST Monochrome Display | | × | |

■Online

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------|-------------------------------|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Monitor | Start Monitoring | ○ | Page 642 Monitor |
| | Start Monitor (bit type only) | ○ | |

Structured Ladder/FBD editor

The following table shows the functions available for editing data in a Structured Ladder/FBD editor.

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------|-------------------------|------------------|---|
| | | Supported or not | Reference/similar function |
| Delete | | ○ | — |
| Select Mode | | ○ | Contacts/coils can always be placed when the editor is in the 'Write' mode. |
| Interconnect Mode | | ○ | Lines can always be drawn when the editor is in the 'Write' mode. |
| Guided Mode | Guided Editing | × | |
| | Overwrite Mode | × | |
| | Insert Mode | × | |
| | Line Mode | × | |
| | Auto Comment | × | |
| Auto Connect | | ○ | • [Edit] ⇨ [Edit Mode] ⇨ [Element Auto-connect] |
| Recalculate Line | | ○ | Lines are always be arranged automatically when the editor is in the 'Write' mode. Page 346 Correcting layout in an FBD network block Page 346 Correcting layout in an FBD network block in a batch |
| Insert Row | | ○ | Page 346 Layout correction |
| Insert Column | | ○ | |
| New Ladder Block List | Top | × | |
| | Before | × | |
| | After | × | |
| | Bottom | × | |
| Input Instruction | | ○ | In GX Works2, enter an instruction in "Input Instruction" screen. In GX Works3, instructions can be entered directly in the editor. |
| Ladder Symbol | Open Contact | ○ | Page 336 Inserting from the menu or on the toolbar |
| | Close Contact | ○ | |
| | Coil | ○ | |
| | Jump | ○ | |
| | Return | ○ | |
| | Open Branch | ○ | |
| | Close Branch | ○ | |
| | Input Label | ○ | |
| | Output Label | ○ | |
| | Horizontal Line Segment | × | Page 336 Inserting from the menu or on the toolbar |
| | Vertical Line Segment | × | |
| | Rising Pulse | ○ | |
| | Falling Pulse | ○ | |
| | Rising Pulse Close | ○ | |
| | Falling Pulse Close | ○ | |
| | Comment | ○ | |
| | Ladder Block Label | ○ | |
| | Left Power Rail | ○ | |
| List Operands | | ○ | • [Edit] ⇨ [Change Name] |
| Number of Pins | Increment | ○ | Page 341 Adding/deleting arguments |
| | Delete | ○ | |

A

| GX Works2 | | GX Works3 | |
|----------------------|-----------|------------------|--|
| | | Supported or not | Reference/similar function |
| Ladder Block List | | ○ | Page 351 Displaying FBD network blocks in a list |
| Signal Configuration | Configure | ○ | Page 337 Switching methods for contacts/instructions |
| | Toggle | ○ | |

■Find/Replace

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------|--|------------------|--|
| | | Supported or not | Reference/similar function |
| Jump | | ○ | Page 351 Displaying FBD network blocks in a list |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---------------------------|----------------------------------|------------------|--|
| | | Supported or not | Reference/similar function |
| View Mode | Label | ○ | Labels used in programs are always displayed with their label names. |
| | Device | × | |
| | Address | × | |
| | Comment | × | |
| | Change Label-Device-Address Mode | × | |
| | Change Label-Comment Mode | × | |
| | Change I/O Label-Comment Mode | ○ | |
| Add Label Display Items | Device | ○ | Page 330 Configuration of an FBD/LD editor |
| | Address | × | |
| | Label Comment | ○ | |
| | Device Comment | ○ | |
| All Device Display | | × | |
| Cancel All Device Display | | × | |
| Grid | | ○ | Page 330 Configuration of an FBD/LD editor |
| Print Wrap Position | | ○ | • [View] ⇨ [Display Page Break] |
| Display Compile Result | | × | |
| Zoom | Set Zoom Factor | ○ | • [View] ⇨ [Zoom] ⇨ [Set Zoom Factor] |
| | Increase Zoom | ○ | • [View] ⇨ [Zoom] ⇨ [Zoom In] |
| | Decrease Zoom | ○ | • [View] ⇨ [Zoom] ⇨ [Zoom Out] |
| Zoom Header/Body | Header | ○ | • [View] ⇨ [Open Label Setting of Selected Element] |
| | Body | ○ | • [View] ⇨ [Open Program Body of Selected Element] |
| Open Header | | ○ | • [View] ⇨ [Open Label Setting] ⇨ [Open in Front] |

CC IE Field configuration window

The following table shows the functions available while the "CC IE Field Configuration" window is displayed.

■CC IE Field configuration

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------------------|---|------------------|--|
| | | Supported or not | Reference/similar function |
| Change Module | Replace General CC IE Field Module | ○ | Page 217 Setting network configuration and target devices |
| | Change to General CC IE Field Module | ○ | |
| Change Transmission Path Method | Line/Star | ○ | |
| | Ring | ○ | |
| Supplementary Setting | | ○ | Navigation window <ul style="list-style-type: none"> "Module Parameter" ⇒ "Basic Settings" ⇒ "Network Topology" "Module Parameter" ⇒ "Basic Settings" ⇒ "Operation of Master Station after Reconnection" "Module Parameter" ⇒ "Application Settings" ⇒ "Supplementary Cyclic Settings" |
| Equal Assignment | | ○ | Page 217 Setting network configuration and target devices |
| Identical Point Assignment | | ○ | |
| Device No. Reassignment | | ○ | |
| Open System Configuration | Open AnyWireASLINK Configuration | ○ | |
| Check | System Configuration | ○ | |
| Online | Detect Now | ○ | |
| | Verification of the Configuration with the Connected Module | × | |
| | Parameter Processing of Device Station | ○ | Page 217 Setting network configuration and target devices |
| | Command Execution of Device Station | ○ | |
| | Backup Device Station | ○ | |
| | Restore Device Station | ○ | |
| Close with Discarding the Setting | | ○ | |
| Close with Reflecting the Setting | | ○ | |

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|------------|--|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Copy | | ○ | — |
| Paste | | ○ | |
| Select All | | ○ | |
| Delete | | ○ | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---------------------|---------------------------|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Docking Window | Module List | ○ | — |
| | Output | ○ | |
| | Supplementary Information | ○ | |
| Object Name Display | | ○ | |

CC-Link configuration window

The following table shows the functions available while the "CC-Link Configuration" window is displayed.

■CC-Link Configuration

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------------------|---|------------------|---|
| | | Supported or not | Reference/similar function |
| Change Module | Replace General CC-Link Module | ○ | Page 217 Setting network configuration and target devices |
| | Change to General CC-Link Module | ○ | |
| Open System Configuration | Open AnyWireASLINK Configuration | ○ | |
| Check | System Configuration | ○ | |
| Online | Detect Now | ○ | Page 217 Setting network configuration and target devices |
| | Verification of the Configuration with the Connected Module | × | |
| | Parameter Processing of Device Station | ○ | |
| | Command Execution of Device Station | ○ | |
| | Backup Device Station | ○ | |
| | Restore Device Station | ○ | |
| Close with Discarding the Setting | | ○ | |
| Close with Reflecting the Setting | | ○ | |

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|------------|--|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Copy | | ○ | — |
| Paste | | ○ | |
| Select All | | ○ | |
| Delete | | ○ | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|----------------|---------------|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Docking Window | Module List | ○ | — |
| | Output | ○ | |
| | Verify Result | × | |

AnyWireASLINK configuration window

The following table shows the functions available while the "AnyWireASLINK Configuration" window is displayed.

■AnyWireASLINK Configuration

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------------------|---|------------------|---|
| | | Supported or not | Reference/similar function |
| Change Module | Replace General AnyWireASLINK Module | ○ | Page 217 Setting network configuration and target devices |
| | Change to General AnyWireASLINK Module | ○ | |
| Address Auto-Input | | ○ | |
| Check | System Configuration | ○ | |
| Online | Detect Now | ○ | |
| | Verification of the Configuration with the Connected Module | ○ | |
| | Parameter Processing of Remote Module | ○ | |
| | Backup Remote Module | ○ | |
| | Restore Remote Module | ○ | |
| Close with Discarding the Setting | | ○ | |
| Close with Saving the Setting | | ○ | |

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|------------|--|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Copy | | ○ | — |
| Paste | | ○ | |
| Select All | | ○ | |
| Delete | | ○ | |

■View


○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|----------------|---------------|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Docking Window | Module List | ○ | — |
| | Output | ○ | |
| | Verify Result | ○ | |

A

Ethernet configuration window

The following table shows the functions available while the "Ethernet Configuration" window is displayed.

The settings of a network configuration and a target device in GX Works3 is set in the configuration setting screen. ( Page 217 Setting network configuration and target devices)

For details on the settings, refer to each user's manual.

■Ethernet Configuration

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------------------|---|------------------|---|
| | | Supported or not | Reference/similar function |
| Change Module | Replace General SLMP Module | ○ | Page 217 Setting network configuration and target devices |
| | Change to General SLMP Module | ○ | |
| Check | System Configuration | ○ | |
| Online | Detect Now | ○ | |
| | Communication Setting Reflection of Ethernet Device | ○ | — |
| | Parameter Processing of Ethernet Device | ○ | |
| | Backup Ethernet Device | ○ | |
| | Restore Ethernet Device | ○ | |
| Close with Discarding the Setting | | ○ | |
| Close with Reflecting the Setting | | ○ | |

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|------------|--|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Copy | | ○ | — |
| Paste | | ○ | |
| Select All | | ○ | |
| Delete | | ○ | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|----------------|-------------|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Docking Window | Module List | ○ | — |
| | Output | ○ | |

CC-Link IEF Basic configuration window

The following table shows the functions available while the "CC-Link IEF Basic Configuration" window is displayed.

■CC-Link IEF Basic Configuration

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------------------|--|------------------|---|
| | | Supported or not | Reference/similar function |
| Change Module | Replace CC-Link IEF Basic Connected Module | ○ | Page 217 Setting network configuration and target devices |
| | Change to CC-Link IEF Basic Connected Module | ○ | |
| Link Scan Setting | | ○ | |
| Check | System Configuration | ○ | |
| Online | Detect Now | ○ | |
| | Communication Setting Reflection of Remote Station | ○ | |
| | Parameter Processing of Remote Station | ○ | |
| Close with Discarding the Setting | | ○ | |
| Close with Reflecting the Setting | | ○ | |

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|------------|--|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Copy | | ○ | — |
| Paste | | ○ | |
| Select All | | ○ | |
| Delete | | ○ | |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|----------------|-------------|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Docking Window | Module List | ○ | — |
| | Output | ○ | |

A

Sensor/device monitor screen

The following table shows the functions available while the sensor/device monitor screen is displayed.

■Sensor/Device Monitor

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---------------------------|----------------------------------|------------------|-------------------------------------|
| | | Supported or not | Reference/similar function |
| Open System Configuration | Open AnyWireASLINK Configuration | ○ | Page 730 Sensor/Device Status Check |

■View

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|----------------|------------------------|------------------|-------------------------------------|
| | | Supported or not | Reference/similar function |
| Docking Window | Monitoring Information | ○ | Page 730 Sensor/Device Status Check |

■Online (CC-Link IE Field Network)

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|--|--|------------------|-------------------------------------|
| | | Supported or not | Reference/similar function |
| Parameter Processing of Device Station | | ○ | Page 730 Sensor/Device Status Check |
| Command Execution of Device Station | | ○ | |
| Start Monitoring | | ○ | |
| Stop Monitoring | | ○ | |

■Online (CC-Link)

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|--|--|------------------|-------------------------------------|
| | | Supported or not | Reference/Similar function |
| Parameter Processing of Device Station | | ○ | Page 730 Sensor/Device Status Check |
| Command Execution of Device Station | | ○ | |
| Backup Device Station | | ○ | |
| Restore Device Station | | ○ | |
| Start Monitoring | | ○ | |
| Stop Monitoring | | ○ | |

■Online (AnyWireASLINK)

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---------------------------------------|--|------------------|-------------------------------------|
| | | Supported or not | Reference/similar function |
| Parameter Processing of Remote Module | | ○ | Page 730 Sensor/Device Status Check |
| Backup Remote Module | | ○ | |
| Restore Remote Module | | ○ | |
| Start Monitoring | | ○ | |
| Stop Monitoring | | ○ | |

■Online (Ethernet)

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|---|------------------|-------------------------------------|
| | Supported or not | Reference/Similar function |
| Parameter Processing of Ethernet Device | ○ | Page 730 Sensor/Device Status Check |
| Backup Ethernet Device | ○ | |
| Restore Ethernet Device | ○ | |
| Start Monitoring | ○ | |
| Stop Monitoring | ○ | |

GX Simulator2 screen

The following table shows the functions available while "GX Simulator2" screen is displayed.

■Tool

○: Similar function supported, ×: Similar function not supported

| GX Simulator2 | | GX Simulator3 | |
|------------------------------------|------|------------------|---|
| | | Supported or not | Reference/similar function |
| Backup Device Memory in Simulation | Save | ○ | The device memory of GX Simulator3 can be read and written by using the following menu in GX Works3. • [Online] ⇄ [Read from PLC] • [Online] ⇄ [Write to PLC] |
| | Read | ○ | |
| I/O System Setting | | ○ | Page 567 Simulation of External Device Operations |

■Options

○: Similar function supported, ×: Similar function not supported

| GX Simulator2 | GX Simulator3 | |
|----------------------------|------------------|--|
| | Supported or not | |
| Start in minimized status | × | |
| Save device memory at stop | × | |

A

Predefined protocol support

The following tables show the functions available while the predefined protocol support function is used.

■File

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------|------------------------------------|------------------|---|
| | | Supported or not | Reference/similar function |
| New | | ○ | Page 228 Predefined Protocol Support Function |
| Open | | ○ | |
| Close | | ○ | |
| Save | | ○ | |
| Save As | | ○ | |
| Open Other Data | Serial Communication Module Format | × | |
| | Ethernet Module Format | × | |
| | Built-in/Adapter Serial Format | × | |
| | Built-in Ethernet Format | × | |
| Print | | ○ | — |
| Exit | | ○ | |

■Edit

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|-----------------------------|--|------------------|---|
| | | Supported or not | Reference/similar function |
| Add Protocol | | ○ | Page 228 Predefined Protocol Support Function |
| Change to Editable Protocol | | ○ | |
| Protocol Detailed Setting | | ○ | |
| Add Receive Packet | | ○ | |
| Delete | | ○ | |
| Copy | | ○ | |
| Paste | | ○ | |
| Delete Multiple Protocols | | ○ | |
| Copy Multiple Protocols | | ○ | |
| Paste Multiple Protocols | | ○ | |
| Device Batch Setting | | ○ | |
| Save User Protocol Library | | ○ | |

■Module Read/Write

○: Similar function supported, ×: Similar function not supported

| GX Works2 | | GX Works3 | |
|---------------------|--|------------------|----------------------------|
| | | Supported or not | Reference/similar function |
| Read from Module | | ○ | — |
| Write to Module | | ○ | |
| Module Verification | | ○ | |

■Tool

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|--------------------------------------|------------------|----------------------------|
| | Supported or not | Reference/similar function |
| Setting Device List | ○ | — |
| Register Predefined Protocol Library | ○ | |

■Debug

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|------------------------|------------------|----------------------------|
| | Supported or not | Reference/similar function |
| Module Selection | ○ | — |
| Protocol Execution Log | ○ | |
| State Monitor | × | |

■Window

○: Similar function supported, ×: Similar function not supported

| GX Works2 | GX Works3 | |
|--------------------------|------------------|----------------------------|
| | Supported or not | Reference/similar function |
| Cascade | ○ | — |
| Tile Horizontally | ○ | |
| (Switch to other window) | ○ | |

Differences of option settings

This section explains the differences of option settings from ones of GX Works2.

Note that the option settings of GX Works3 can be set in the "Options" screen ([Tool]] ⇨ [Options]).

For details, refer to the following:

☞ Page 85 Option Settings for Each Function

List of GX Works2 option settings

| Item | | Reference |
|------------------------------------|----------------------------|--|
| Project | Common Setting | Page 1083 Common Setting |
| | Automatic Save | Page 1083 Automatic Save |
| | Change history | Page 1083 Change history |
| Program Editor | All Editors | Page 1084 All Editors |
| | Structured Ladder/FBD/ST | Page 1084 Structured Ladder/FBD/ST |
| | Structured Ladder/FBD | Page 1085 Structured Ladder/FBD |
| | ST | Page 1086 ST |
| | Ladder/SFC | Page 1087 Ladder/SFC |
| | Ladder | Page 1088 Ladder |
| | SFC | Page 1089 SFC |
| Device Comment Editor | | Page 1090 Device Comment Editor |
| Device Memory Editor | | Page 1090 Device Memory Editor |
| Label Setting Editor | | Page 1090 Label Setting Editor |
| Parameter | | Page 1091 Parameter |
| Monitor | Common | Page 1091 Common |
| | Structured Ladder/FBD/ST | Page 1091 Structured Ladder/FBD/ST |
| | Ladder/SFC | Page 1092 Ladder/SFC |
| | Ladder | Page 1092 Ladder |
| | SFC | Page 1092 SFC |
| PLC Read/Write | | Page 1093 PLC Read/Write |
| Online Change | | Page 1093 Online Change |
| Symbolic Information | | Page 1093 Symbolic Information |
| Save Destination of Device Comment | | Page 1094 Save Destination of Device Comment |
| Compile | Basic Setting | Page 1094 Basic Setting |
| | Output Result | Page 1094 Output Result |
| | Ladder/SFC | Page 1094 Ladder/SFC |
| | Structured Ladder/FBD/ST | Page 1095 Structured Ladder/FBD/ST |
| Intelligent Function Module | QD75/LD75 type positioning | Page 1096 QD75/LD75 Type Positioning |
| | Guidance | Page 1096 Guidance |
| iQ Works Interaction | | Page 1096 iQ Works Interaction |
| System Label Setting | | Page 1096 System Label Setting |
| Sampling Trace | | Page 1096 Sampling trace |

Project

■Common Setting

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Similar setting |
| Automatically change language according to system | ○ | • "Edit" ⇒ "Language" ⇒ "Automatically change language according to system" |
| Use Dedicated Instruction for GX Developer, GX IEC Developer | × | |
| Connect directly to PLC on creating a new project | × | |
| Enable the security check for the project | × | |

■Automatic Save

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | Similar setting |
| Save project after compiling | ○ | • "Project" ⇒ "Save" ⇒ "Save project after conversion" |
| Save project after writing to PLC | ○ | • "Project" ⇒ "Save" ⇒ "Save project after Write to PLC" |
| Save project after online change | ○ | • "Project" ⇒ "Save" ⇒ "Save project after Online Program Change" |
| Save project after changes in TC setting values are written to PLC | ○ | • "Project" ⇒ "Save" ⇒ "Save project after changing TC Setting Value and writing to PLC" |

■Change history

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | Similar setting |
| Revision is not Registered when Save Project | ○ | • "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Register to the Revision When Saving Project" |
| Revision is Registered when Save Project | ○ | |
| Display confirmation message showing whether to register history | ○ | • "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Display Confirmation Message Showing Whether to Register Revision" |
| Automatically set revision titles | ○ | • "Project" ⇒ "Revision" ⇒ "Operational Setting" ⇒ "Automatically Set Revision Titles" |

A

Program Editor

■All Editors

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|----------------|---|------------------|---|
| | | Supported or not | Similar setting |
| Device Comment | Program/Program File Name | ○ | • "Project" ⇔ "Device Comment Reference/Reflection Target" ⇔ "(program/program file name)" |
| | Specify the Reference/Reflection Target | ○ | • "Project" ⇔ "Device Comment Reference/Reflection Target" |
| | Reference/Reflect the other, when device comment is not set | ○ | • "Project" ⇔ "Device Comment Reference/Reflection Target" ⇔ "Reference/Reflection Target for Device Comment" ⇔ "Reference/Reflect the Other Device Comment When Setting Device Comment" |
| | [Apply to all programs] button | × | |
| | [Global] button | ○ | • "Project" ⇔ "Device Comment Reference/Reflection Target" ⇔ "(program/program file name)" Select 'Common' for the application and reference destinations of device comments for each device. |
| | [Local] button | ○ | • "Project" ⇔ "Device Comment Reference/Reflection Target" ⇔ "(program/program file name)" Select 'Each Program' or the application and reference destinations of device comments for each device. |
| | [PLC Parameter Setting] button | × | |

■Structured Ladder/FBD/ST

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|-----------|--------------------------|------------------|--|
| | | Supported or not | Similar setting |
| Tool Hint | Monitored Value | × | • "Program Editor" ⇔ "FBD/LD Editor" ⇔ "Tool Hint" ⇔ "Display Item in Tool Hint" |
| | Class | ○ | |
| | Device | ○ | |
| | Address | × | |
| | Device Comment | ○ | |
| | Data Type | ○ | |
| | Constant Value | ○ | |
| | Label Comment | ○ | |
| | Remark | × | |
| | Tool Hint Display Format | × | |

■Structured Ladder/FBD

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|-----------|--|------------------|--|
| | | Supported or not | Similar setting |
| Label | Display label name/comment of contact or coil in multiline | ○ | <ul style="list-style-type: none"> • Comment: "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Comment" ⇒ "Display Format" ⇒ "Number of Rows" • Label name: "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Element (Ladder Symbol)" ⇒ "Display Format" ⇒ "Numbers of Wrapping Rows for Device/Label Name" • Label name: "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Element (Ladder Symbol)" ⇒ "Display Format" ⇒ "Number of Cells for Device/Label Name" |
| | Device | ○ | <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Element (Ladder Symbol)" ⇒ "Display Format" ⇒ "Display Labels and Devices" |
| | Address | × | |
| | Label Comment | ○ | <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Comment" ⇒ "Display Item" ⇒ "Display Label/Device Comment" |
| | Device Comment | ○ | |
| | Declare new label name | ○ | <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "Enter Element" ⇒ "Operational Setting" ⇒ "Open undefined label registration window at element entry" |
| FB/FUN | Wrap instance name for function block | ○ | <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FB/FUN" ⇒ "Display Format" ⇒ "Number of Wrapping Rows for Instance Name" |
| | Specify the number of enable characters for label name/comment | × | |
| | Automatic input/output labels | × | |
| | Automatic ENO labels | × | |
| | Automatically Add Output Variable to VAR_IN_OUT | × | |
| | Pin overwrites | × | |
| | Double clicking opens header | ○ | <ul style="list-style-type: none"> • "Program Editor" ⇒ "FBD/LD Editor" ⇒ "FB/FUN" ⇒ "Operational Setting" ⇒ "Operation on Double-clicking" |
| | Double clicking opens body | ○ | |
| Guided | Ladder Wrapping | × | |
| | Return Contacts | × | |
| | Open Structured Ladder/FBD Editor in guided mode | × | |
| | Allow hotkey repeater | × | |
| | Enter label names after contacts and coils | × | |
| | Auto Comment Block Width | × | |

A

■ST

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|-----------------------------------|------------------|--|
| | Supported or not | Similar setting |
| Auto Indention | ○ | <ul style="list-style-type: none"> • "Program Editor" ⇒ "ST Editor" ⇒ "Edit Operation" ⇒ "Automatic Indention" |
| Instruction/label name prediction | ○ | <ul style="list-style-type: none"> • "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Operational Setting" ⇒ "Instruction/Device/Label name Prediction" <p>The setting is applied to all program editors.</p> |
| Tabulator Length | ○ | <ul style="list-style-type: none"> • "Program Editor" ⇒ "ST Editor" ⇒ "Edit Operation" ⇒ "Tabulator Length" |

■Ladder/SFC

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|--------------|--|------------------|---|
| | | Supported or not | Similar setting |
| Enter ladder | Check duplicated coil | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter ladder" ⇒ "Operational Setting" ⇒ "Check Duplicated Coil" |
| | Enter label comment and device comment | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter ladder" ⇒ "Operational Setting" ⇒ "Enter label comment and device comment" |
| | Do not leave the Device/Label Comment field editing status | × | |
| | Do not display note in ladder input window when edit coil instructions | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter ladder" ⇒ "Operational Setting" ⇒ "Display Note in Ladder Input Window When Editing Coil Instructions" |
| | Check special relay/special register compatible with A-PLC | × | |
| | Display available instruction tool hints in entering instruction | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter ladder" ⇒ "Display Setting" ⇒ "Display tool hint of instruction when entering instruction" |
| | Display available instructions in entering instruction | ○ | • "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Operational Setting" ⇒ "Instruction/Device/Label name Prediction" |
| | Display available labels in entering instruction | ○ | • "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Operational Setting" ⇒ "Instruction/Device/Label name Prediction" • "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display Local Labels" • "Edit" ⇒ "Instruction/Device/Label Candidacy Display" ⇒ "Candidate Display Setting" ⇒ "Display Global Labels" |
| Tool Hint | Monitored Value | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Tool Hint" ⇒ "Display Item in Tool Hint" |
| | Class | ○ | |
| | Device | ○ | |
| | Device Comment | ○ | |
| | Data Type | ○ | |
| | Constant Value | ○ | |
| | Label Comment | ○ | |
| | Remark | × | |
| | Tool Hint Display Format | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Tool Hint" ⇒ "Display in Multiline" |

A

■Ladder

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|----------------|--|------------------|---|
| | | Supported or not | Similar setting |
| Comment | Device Comment | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Display Items" |
| | Statement | ○ | |
| | Note | ○ | |
| | Device Comment Display Format | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Display Format" |
| | Copy device comment in copying ladder | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Comment" ⇒ "Operational Setting" ⇒ "Copy Device Comment in Copying Ladder" |
| Ladder Diagram | Display Connection of Ladder Diagram | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Display Connection of Ladder Diagram" |
| | Use the Switching Ladder Edit Mode (Read, Write, Monitor, Monitor (Write)) | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Use the Switching Ladder Edit Mode (Read, Write, Monitor, Monitor (Write))" |
| | Display labels and devices | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Display Format" ⇒ "Display labels and devices" |
| | Display STL instruction in contact format. | × | |
| | Display Instruction Help at symbol error occurrence | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter Ladder" ⇒ "Operational Setting" ⇒ "Display Help ladder input window when symbol errors occur" |
| | Open Undefined Label Registration dialog at ladder entry | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Enter Ladder" ⇒ "Operational Setting" ⇒ "Open Undefined Label Registration Window at Ladder Entry" |
| | Set initial value to '1' for Enter HLine/Delete HLine dialog | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Set initial value to '1' for Enter HLine/Delete HLine dialog" |
| | Stop at the connection points (Instruction/Vertical Line) when enter or delete horizontal line | ○ | • "Program Editor" ⇒ "Ladder Editor" ⇒ "Ladder Diagram" ⇒ "Edit Operation" ⇒ "Stop at the connection points (Instruction/Vertical Line) when enter or delete horizontal line" |

■SFC

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | | GX Works3 | |
|-----------|--------------------------------------|--------------------------|------------------|---|
| | | | Supported or not | Similar setting |
| Comment | Block List | | ○ | • "Program Editor" ⇨ "SFC Diagram Editor" ⇨ "Blocklist" ⇨ "Comment Display Items" ⇨ "Display Label/Device Comment" |
| | Step/Transition | | ○ | • "Program Editor" ⇨ "SFC Diagram Editor" ⇨ "Comment" ⇨ "Display Item" ⇨ "Display Label/Device Comment" |
| SFC 1 | SFC Edit Area | | × | |
| | Tile SFC and Zoom vertically | Arrange | × | |
| | | SFC Display Window Ratio | × | |
| | MELSAP-L Label/Device Display Format | | × | |
| | Jump to start destination block | | × | |
| SFC 2 | Leave comment or step No. selected | | × | |
| Zoom | Open Zoom with New Window | | ○ | • "Program Editor" ⇨ "SFC Diagram Editor" ⇨ "Action/Transition" ⇨ "Display Format" ⇨ "Window Display Method" |
| | Number of Action/Transition Contacts | | ○ | • "Program Editor" ⇨ "Ladder Editor" ⇨ "Ladder Diagram" ⇨ "Display Format" ⇨ "Display Connection of Ladder Diagram" |

Device Comment Editor

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Similar setting |
| Number of Device Comment Edit/Display Characters | ○ | • "Other Editor" ⇒ "Device Comment Editor" ⇒ "Number of Editing/Displaying Characters" ⇒ "Number of Device Comment Editing/Displaying Characters" |
| Extended setting | × | |
| Execute the operation including the hidden bit specification information | × | |

Device Memory Editor

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|------------------------------|------------------|--|
| | Supported or not | |
| Always Confirm | × | |
| Auto | × | |
| Specify the number of column | × | |

Label Setting Editor

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|---|------------------|--|
| | Supported or not | Similar setting |
| Automatic copy and increment when inserting a row | ○ | • "Other Editor" ⇒ "Label Editor Common" ⇒ "Editor Setting" ⇒ "Automatic Copy and Increment in Inserting a Row" |
| Copy data type/comment items | ○ | • "Other Editor" ⇒ "Label Editor Common" ⇒ "Editor Setting" ⇒ "Automatic Copy and Increment in Inserting a Row" ⇒ "Copy Data Type/Comment Items" |
| Default Length of String Data Type | ○ | • "Other Editor" ⇒ "Label Editor Common" ⇒ "Data Type Setting" ⇒ "Data Length of Character String Data Type" |
| Display last blank row | ○ | • "Other Editor" ⇒ "Label Editor Common" ⇒ "Display Setting" ⇒ "Display Last Blank Row" |

Parameter



○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | |
| Use user defined parameter | ○ | |
| Display number of columns for CC-Link list setting | × | |
| Display number of rows for CC-Link station information | × | |

Monitor

■Common

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|---|------------------|---|
| | Supported or not | Similar setting |
| Disable Current Value Changing by Pressing the  +  keys | × | |
| Start monitoring if converted or compiled program is opened during monitoring | ○ | <ul style="list-style-type: none"> • "Monitor" ⇒ "Common Item" ⇒ "'Ladder'/'ST'/'FBD'/'LD'/'SFC'" ⇒ "Operational Setting" ⇒ "Start monitoring when opening program editor during monitoring" |

■Structured Ladder/FBD/ST

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Similar setting |
| Display Format of Monitoring Value | ○ | <ul style="list-style-type: none"> • "Monitor" ⇒ "ST Editor" ⇒ "Display Setting" ⇒ "Display Format of Monitoring Value" • "Monitor" ⇒ "FBD/LD Editor" ⇒ "Display Setting" ⇒ "Display Format of Monitoring Value" |
| Monitor buffer memory and link direct device | ○ | <ul style="list-style-type: none"> • "Monitor" ⇒ "ST Editor" ⇒ "Operational Setting" ⇒ "Monitor Buffer Memory and Link Memory" • "Monitor" ⇒ "FBD/LD Editor" ⇒ "Operational Setting" ⇒ "Monitor Buffer Memory and Link Memory" |
| Significant Characters | ○ | <ul style="list-style-type: none"> • "Monitor" ⇒ "ST Editor" ⇒ "Character String Monitoring Setting" ⇒ "Numbers of Characters to Display" • "Monitor" ⇒ "FBD/LD Editor" ⇒ "Character String Monitoring Setting" ⇒ "Numbers of Characters to Display" • "Monitor" ⇒ "SFC Diagram Editor" ⇒ "Character String Monitoring Setting" ⇒ "Numbers of Characters to Display" |
| Verify with PLC setting before starting monitoring | × | |

A

■Ladder/SFC

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Similar setting |
| Set automatic registration destination | ○ | <ul style="list-style-type: none"> • "Monitor" ⇒ "Ladder Editor" ⇒ "Setting for Automatic Registration to Watch Window" ⇒ "Set Automatic Registration Destination" • "Monitor" ⇒ "SFC Diagram Editor" ⇒ "Setting for Automatic Registration to Watch Window" ⇒ "Set Automatic Registration Destination" |

■Ladder

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | Similar setting |
| Display Format of Monitoring Value | ○ | • "Monitor" ⇒ "Ladder Editor" ⇒ "Display Setting" ⇒ "Display Format of Monitoring Value" |
| Monitor buffer memory and link direct device | ○ | • "Monitor" ⇒ "Ladder Editor" ⇒ "Operational Setting" ⇒ "Monitor Buffer Memory and Link Memory" |
| FXGP format Ladder monitor | × | |
| Display monitored value by device/label name of contact/coil instruction | ○ | • "Monitor" ⇒ "Ladder Editor" ⇒ "Operational Setting" ⇒ "Display Monitored Value by Device/Label Name of Contact/Coil Instruction" |
| Display Lines for Monitoring Current Value | ○ | • "Monitor" ⇒ "Ladder Editor" ⇒ "Display Setting" ⇒ "Display Lines for Monitoring Current Value" |

■SFC

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | Similar setting |
| Watch Step Not Transferring within Watching Time | × | |
| Program/Program File Name | × | |
| Target All Blocks | × | |
| Specify the Block | × | |
| Detail Setting | × | |
| Stop Transition Watch Monitor when Detected | × | |
| Monitor block start with new window | ○ | • "Monitor" ⇒ "SFC Diagram Editor" ⇒ "Auto-scroll Monitor Setting" ⇒ "Monitor the Block Start in a New Window" |

PLC Read/Write

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Similar setting |
| Keep last file selection for PLC read/write dialog | ○ | • "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Store file selection status in writing to PLC." |
| Turn PLC to STOP at time of PLC write after executing Rebuild All and do not execute remote RUN | × | |
| Clear the device ranges set in the Device/Label Automatic-Assign setting to 0 at time of PLC write after a Rebuild All operation | × | |
| Check the password in reading/writing/verifying/deleting PLC | × | |
| Check program cache memory when writing to PLC | × | |
| Merge device comment with the project data at time of PLC read | × | |
| Show a completion message if the PLC read/write window is automatically closed | ○ | • "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Show a completion message when the window is automatically closed in executing" |
| Show the confirmation message in executing Write to PLC | ○ | • "Online" ⇒ "Write to PLC" ⇒ "Operational Setting" ⇒ "Show a confirmation message in executing" |

Online Change

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Similar setting |
| Execute fall instruction | × | |
| Transfer program cache memory to program memory | × | |
| Execute online change based on relative step No. | × | |
| Execute online change by Compile | ○ | • "Convert" ⇒ "Online Program Change" ⇒ "Operational Setting" ⇒ "Execute Online Program Change in Converting" |
| Under booting, reflect changes to boot source during online program change | × | • When performing the online program change during the boot operation, select the checkbox of "Reflect Changes to Boot Source." |

Symbolic Information

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|---|------------------|---|
| | Supported or not | Similar setting |
| Setting for Writing Symbolic Information to PLC | × | |
| Write symbolic information when Online Program Change is executed | × | |
| In the Write to PLC window, keep the symbolic information selected status as a write target | ○ | • "Online" ⇒ "Program Restore Information" ⇒ "Operational Setting" ⇒ "Enable the setting to write/not to write program restore information" |
| Setting for Save Destination of Symbolic Information to PLC | × | |

A

Save Destination of Device Comment

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|---|--|------------------|--|
| | | Supported or not | |
| Set save destination of device comment to the target memory of PLC data | | × | |
| Save Destination of Device Comment | | × | |

Compile

■Basic Setting

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|--|--|------------------|---|
| | | Supported or not | Similar setting |
| Enable calling function block and using inline ST | | × | |
| Do not execute duplicated coil check, ladder check and consistency (pair) check after Build or Online Program Change | | ○ | • "Convert" ⇒ "Basic Setting" ⇒ "Program Check" ⇒ "Execute Program Check after Build or Online Program Change" |
| Do not target the SET instruction for duplicated coil check | | ○ | • "Convert" ⇒ "Basic Setting" ⇒ "Program Check" ⇒ "Target the SET instruction for duplicated coil check" |
| Use the same label name in global label and local label | | ○ | • "Convert" ⇒ "Basic Setting" ⇒ "Operational Setting" ⇒ "Use the Same Label Name in Global Label and Local Label" |
| Create cross reference information after completion compile. | | ○ | • "Find/Replace" ⇒ "Cross Reference" ⇒ "Operational Setting" ⇒ "Information Update Timing on Auto-tracking" ⇒ "When the Conversion is Executed" |

■Output Result

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|--|---|------------------|---|
| | | Supported or not | Similar setting |
| Stop Build by | | ○ | • "Convert" ⇒ "Output Result" ⇒ "Cancel Conversion" ⇒ "Number of Conversions to Cancel" |
| Disable Warning and Notification Message | Display the Use Status Notification of Automatic-Assign Device in Output Result | × | |

■Ladder/SFC

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 | |
|-------------------|--|------------------|--|
| | | Supported or not | |
| Compile Condition | Make sure that the instruction is not used beyond the device range assigned by the label | × | |

■Structured Ladder/FBD/ST

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | | GX Works3 |
|---------------------|--|------------------|
| | | Supported or not |
| Compile Condition 1 | Use lower-case device names as labels | × |
| | Function Output Setting | × |
| | Allow VAR_OUTPUT at FB call (ST) | × |
| | Add temporary variables as arguments to use macrocode | × |
| Compile Condition 2 | (D)INT_TO_BOOL_E,(D)WORD_TO_BOOL_E, TIME_TO_BOOL_E(I) | × |
| | NOT_E | × |
| | LIMITATION_E,MAXIMUM_E,MINIMUM_E | × |
| | EQ_E,NE_E,GT_E,GE_E,LT_E,LE_E | × |
| | AND_E,OR_E, XOR_E | × |
| | User Defined Function with EN/ENO | × |
| | User Defined Function Block with EN/ENO | × |
| Compile Condition 3 | Automatically assign each system device to output of functions that use EN/ENO | × |

Intelligent Function Module

■QD75/LD75 Type Positioning

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | |
| Display Specification of Positioning Data | × | |
| Confirm PLC operation status when writing a Data | × | |
| Display a confirmation message when writing to flash ROM | × | |

■Guidance

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | |
| Display intelligent function module guidance | × | |

iQ Works Interaction

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | |
| Enable an editing of parameters set in MELSOFT Navigator | × | |

System Label Setting

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|---|
| | Supported or not | Similar setting |
| Use MELSOFT Navigator Option Information | ○ | • "iQ Works Interaction" ⇒ "System Label Setting" ⇒ "System Label Setting" ⇒ "Use MELSOFT Navigator Option Information" |
| System Label Name Setting | ○ | • "iQ Works Interaction" ⇒ "System Label Setting" ⇒ "System Label Setting" ⇒ "Use MELSOFT Navigator Option Information" ⇒ "System Label Name Setting" |

Sampling trace

○: Similar setting supported, ×: Similar setting not supported

| GX Works2 | GX Works3 | |
|--|------------------|--|
| | Supported or not | |
| Display a message to confirm operation contents at the start of trace | × | |
| Display a message to confirm discard of the trace result at the start of trace | × | |
| Display a caution message in saving data as GX LogViewer format CSV file | × | |

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MEMO

REVISIONS

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| April 2015 | SH(NA)-081215ENG-E | <p>■Added or modified parts</p> <p>TERMS, Section 2.3, Section 2.4, Section 2.9, Section 3.2, Section 3.3, Section 3.4, Section 3.5, Section 3.6, Section 4.2, Section 4.3, Section 4.4, Section 6.1, Section 6.2, Section 6.3, Section 6.7, Chapter 10, Section 10.1, Section 10.3, Section 10.4, Section 13.2, Section 15.4, Chapter 16, Section 16.2, Section 16.3, Appendix 1, Appendix 4</p> |
| July 2015 | SH(NA)-081215ENG-F | <p>■Added or modified parts</p> <p>TERMS, Section 1.2, Section 1.3, Section 1.4, Section 2.1, Section 2.3, Section 2.4, Section 2.7, Section 2.9, Section 3.1, Section 3.2, Section 3.3, Section 3.4, Section 3.5, Section 3.6, Section 3.7, Section 4.1, Section 4.2, Section 4.3, Section 5.1, Section 5.2, Section 5.4, Section 6.1, Section 6.2, Section 6.3, Section 6.5, Section 6.6, Section 6.8, Section 6.9, Section 6.10, Chapter 9, Section 9.1, Section 9.2, Section 9.3, Section 9.4, Section 9.5, Section 9.6, Section 9.7, Chapter 10, Section 10.1, Section 10.3, Section 10.4, Chapter 11, Section 11.3, Section 12.3, Section 13.1, Section 13.3, Section 13.6, Chapter 14, Section 14.1, Section 14.2, Section 14.3, Section 14.4, Section 14.9, Chapter 15, Section 15.3, Section 15.4, Section 15.5, Section 15.6, Section 15.7, Section 16.2, Section 16.4, Chapter 18, Section 18.3, Section 18.5, Appendix 1, Appendix 2, Appendix 3, Appendix 4, Appendix 5</p> |
| January 2016 | SH(NA)-081215ENG-G | <p>■Added or modified parts</p> <p>TERMS, Section 2.2, Section 2.3, Section 2.4, Section 2.9, Section 3.2, Section 3.3, Section 3.5, Section 4.1, Section 4.2, Section 4.3, Section 4.5, Section 5.2, Section 6.1, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 6.8, Section 6.9, Section 6.10, Chapter 9, Section 9.3, Section 10.1, Section 10.2, Section 10.3, Section 10.4, Section 11.1, Section 11.2, Section 11.3, Section 11.4, Section 12.1, Section 12.2, Section 13.1, Section 13.3, Section 13.6, Section 14.2, Section 14.3, Section 14.9, Section 18.1, Appendix 1, Appendix 2, Appendix 4, Appendix 5, Appendix 6, Appendix 7</p> |
| February 2016 | SH(NA)-081215ENG-H | <p>■Added or modified parts</p> <p>Section 2.3, Section 2.4, Section 3.2, Section 3.5, Section 6.5, Section 6.8, Section 6.9, Section 13.1, Section 13.3, Section 15.5, Appendix 1, Appendix 7</p> |
| May 2016 | SH(NA)-081215ENG-I | <p>■Added or modified parts</p> <p>TERMS, Section 1.2, Section 1.3, Section 1.4, Section 1.5, Section 1.6, Section 1.8, Section 2.1, Section 2.2, Section 2.3, Section 2.4, Section 2.6, Section 3.1, Section 3.2, Section 3.3, Section 3.4, Section 3.5, Section 3.6, Section 4.1, Section 4.2, Section 4.4, Section 5.1, Section 5.2, Section 5.3, Chapter 6, Section 6.2, Section 6.3, Section 6.7, Section 6.8, Section 6.9, Section 6.10, Section 7.3, Section 8.1, Chapter 9, Section 9.1, Section 9.5, Section 9.6, Section 9.7, Chapter 10, Section 10.1, Section 10.3, Section 10.4, Section 11.3, Section 11.4, Section 12.1, Section 12.2, Section 12.3, Section 12.6, Section 12.7, Section 12.8, Section 13.1, Section 13.2, Section 13.3, Section 13.4, Section 13.6, Section 14.1, Section 14.2, Section 14.3, Section 14.4, Section 14.5, Section 14.6, Section 14.8, Section 14.9, Chapter 15, Section 15.3, Section 15.5, Section 16.1, Section 16.2, Section 16.3, Chapter 18, Section 18.1, Section 18.2, Section 18.3, Section 18.4, Section 18.6, Appendix 1, Appendix 3, Appendix 4, Appendix 5, Appendix 7, Appendix 8</p> |

| Revision date | *Manual number | Description |
|---------------|--------------------|--|
| October 2016 | SH(NA)-081215ENG-J | <p>■Added or modified parts</p> <p>TERMS, Section 2.4, Section 2.5, Section 2.8, Section 2.9, Section 3.1, Section 3.2, Section 3.5, Section 4.1, Section 4.2, Section 5.2, Section 6.3, Section 6.5, Section 6.6, Section 6.7, Section 6.9, Section 6.10, Section 7.2, Section 7.3, Chapter 9, Section 9.1, Section 9.3, Section 9.6, Section 11.1, Section 11.2, Section 11.3, Section 11.4, Section 12.1, Section 12.2, Section 12.6, Section 13.1, Section 13.2, Section 13.3, Section 13.6, Section 14.1, Section 14.2, Section 14.4, Section 14.5, Section 14.8, Section 14.10, Section 15.6, Section 16.1, Section 16.3, Section 16.4, Chapter 17, Section 17.1, Appendix 1, Appendix 2, Appendix 4, Appendix 5, Appendix 7, Appendix 8</p> |
| January 2017 | SH(NA)-081215ENG-K | <p>■Added or modified parts</p> <p>TERMS, Section 1.2, Section 1.7, Section 1.8, Section 2.4, Section 2.8, Section 2.9, Section 3.1, Section 3.2, Section 3.4, Section 3.5, Section 5.4, Section 6.1, Section 6.2, Section 6.3, Section 6.5, Section 6.6, Section 6.7, Section 6.8, Section 6.9, Section 7.1, Chapter 10, Section 10.1, Section 13.1, Section 13.3, Chapter 14, Section 14.1, Section 14.2, Section 14.11, Section 16.2, Section 16.4, Section 18.4, Appendix 1, Appendix 4, Appendix 5, Appendix 7</p> |
| February 2017 | SH(NA)-081215ENG-L | <p>■Added or modified parts</p> <p>Section 3.6, Section 5.4</p> |
| April 2017 | SH(NA)-081215ENG-M | <p>■Added or modified parts</p> <p>Section 1.2, Section 2.4, Section 2.7, Section 2.8, Section 2.9, Section 3.2, Section 3.4, Section 3.5, Section 4.1, Section 4.2, Section 5.2, Section 6.3, Section 6.5, Section 6.7, Section 6.9, Section 9.1, Section 10.1, Section 11.3, Section 12.1, Section 12.2, Section 12.9, Section 13.1, Section 13.2, Section 13.3, Section 13.6, Chapter 14, Section 14.2, Section 14.9, Section 14.10, Section 16.4, Chapter 17, Section 17.1, Section 17.2, Section 17.3, Section 18.4, Appendix 1, Appendix 4, Appendix 5, Appendix 7, Appendix 9</p> |
| July 2017 | SH(NA)-081215ENG-N | <p>■Added or modified parts</p> <p>Section 1.2, Section 3.3, Section 3.5, Section 6.9, Section 10.1, Section 13.2, Appendix 1, Appendix 4</p> |
| October 2017 | SH(NA)-081215ENG-O | <p>■Added or modified parts</p> <p>TERMS, Section 1.2, Section 1.3, Section 1.4, Section 1.7, Section 1.8, Section 2.3, Section 2.4, Section 2.7, Section 2.8, Section 2.9, Section 3.1, Section 3.2, Section 3.4, Section 3.5, Section 3.6, Chapter 4, Section 4.1, Section 4.2, Section 4.3, Section 4.4, Section 5.1, Section 5.2, Section 5.3, Section 5.4, Section 5.5, Section 6.2, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 6.8, Section 6.9, Section 6.10, Section 7.2, Section 7.3, Section 8.2, Section 8.3, Chapter 9, Section 9.1, Section 9.6, Section 9.7, Chapter 10, Section 10.1, Section 10.2, Section 10.3, Section 10.4, Section 11.1, Section 11.3, Section 12.1, Section 12.8, Section 13.1, Section 13.2, Section 13.3, Section 13.4, Section 13.6, Chapter 14, Section 14.1, Section 14.2, Section 14.3, Section 14.4, Section 14.5, Section 14.6, Section 14.8, Section 14.10, Chapter 15, Section 15.1, Section 15.2, Section 15.3, Section 15.4, Section 15.5, Section 15.6, Section 15.7, Section 16.1, Section 16.2, Section 16.3, Section 16.4, Section 16.5, Section 17.1, Section 17.2, Section 17.3, Chapter 18, Section 18.1, Section 18.2, Section 18.3, Section 18.4, Section 18.6, Appendix 1, Appendix 2, Appendix 3, Appendix 4, Appendix 5, Appendix 7, Appendix 10, Appendix 11</p> |
| April 2018 | SH(NA)-081215ENG-P | <p>■Added or modified parts</p> <p>Section 1.2, Section 1.7, Section 2.3, Section 2.4, Section 2.8, Section 3.2, Section 3.5, Section 3.7, Chapter 4, Section 4.1, Section 4.2, Section 4.6, Section 5.1, Section 5.2, Section 6.3, Section 6.4, Section 6.5, Section 6.9, Section 6.10, Section 7.2, Chapter 9, Section 9.1, Section 9.3, Section 9.4, Section 9.5, Section 9.6, Section 9.7, Section 10.1, Section 10.3, Section 11.2, Section 11.3, Section 11.4, Section 12.1, Section 12.7, Section 12.10, Section 13.1, Section 13.2, Section 13.3, Chapter 14, Section 14.2, Section 14.3, Section 14.4, Section 14.5, Section 14.6, Section 14.9, Section 14.11, Section 15.3, Section 15.4, Section 15.5, Chapter 16, Section 16.1, Section 16.2, Section 16.4, Section 17.3, Appendix 1, Appendix 2, Appendix 4, Appendix 5, Appendix 7, Appendix 11</p> |
| July 2018 | SH(NA)-081215ENG-Q | <p>■Added or modified parts</p> <p>Section 2.4, Section 5.2, Section 6.3, Section 6.7, Section 6.9, Section 7.2, Section 9.1, Section 9.2, Section 9.3, Section 9.4, Section 9.6, Section 10.1, Section 11.1, Section 11.3, Section 13.3, Chapter 14, Section 14.1, Section 14.2, Section 14.4, Section 14.6, Appendix 1, Appendix 4, Appendix 5, Appendix 7, Appendix 11</p> |
| October 2018 | SH(NA)-081215ENG-R | <p>■Added or modified parts</p> <p>Section 1.3, Section 2.3, Section 2.4, Section 2.8, Section 2.9, Section 3.2, Section 3.3, Section 3.5, Section 4.2, Section 4.6, Section 5.4, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 6.10, Section 9.6, Section 10.3, Section 11.3, Section 12.6, Section 13.1, Section 13.6, Section 14.2, Section 14.5, Section 14.12, Chapter 15, Section 15.4, Section 15.5, Section 15.6, Section 16.4, Appendix 1, Appendix 4, Appendix 5, Appendix 11</p> |
| December 2018 | SH(NA)-081215ENG-S | <p>■Added or modified parts</p> <p>Section 1.2, Section 2.8, Section 3.5, Section 13.2, Section 16.4, Appendix 1, Appendix 4</p> |

| Revision date | *Manual number | Description |
|---------------|---------------------|---|
| April 2019 | SH(NA)-081215ENG-T | <p>■Added or modified parts</p> <p>Section 1.2, Section 1.7, Section 2.2, Section 2.4, Section 2.7, Section 2.8, Section 3.2, Section 3.3, Section 3.4, Section 3.5, Section 4.2, Section 4.3, Section 4.6, Section 5.2, Section 6.2, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 6.9, Section 6.10, Section 7.4, Chapter 9, Section 9.1, Section 9.4, Section 9.5, Section 9.6, Section 10.3, Section 12.1, Section 12.2, Section 12.3, Section 12.4, Section 12.7, Section 12.8, Section 13.1, Section 13.2, Section 13.3, Section 14, Section 14.2, Section 14.4, Section 14.6, Section 14.12, Section 15.7, Section 16.2, Section 16.4, Appendix 1, Appendix 3, Appendix 4, Appendix 5, Appendix 7, Appendix 8, Appendix 9, Appendix 11</p> |
| June 2019 | SH(NA)-081215ENG-U | <p>■Added or modified parts</p> <p>Section 2.4, Section 4.3, Appendix 1</p> |
| July 2019 | SH(NA)-081215ENG-V | <p>■Added or modified parts</p> <p>Section 2.4, Section 2.7, Section 3.5, Section 3.7, Section 5.2, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 6.8, Section 6.9, Section 6.10, Section 9.1, Section 9.4, Section 9.5, Section 10.3, Section 14.1, Section 14.4, Section 16.3, Section 17.3, Appendix 1, Appendix 5, Appendix 11</p> |
| October 2019 | SH(NA)-081215ENG-W | <p>■Added or modified parts</p> <p>TERMS, Chapter 1, Section 1.2, Section 1.9, Section 2.3, Section 2.4, Section 2.9, Section 3.1, Section 3.2, Section 3.3, Section 3.4, Section 3.5, Section 3.6, Chapter 4, Section 4.1, Section 4.2, Section 4.3, Section 5.3, Section 5.5, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 6.10, Section 6.11, Section 7.5, Section 9.6, Section 11.1, Section 11.3, Section 12.1, Section 12.2, Section 12.3, Section 12.4, Section 12.5, Section 12.6, Section 12.7, Section 12.8, Section 12.9, Section 12.10, Section 13.1, Section 13.3, Section 13.4, Section 13.6, Chapter 14, Section 14.2, Section 14.4, Section 14.5, Section 14.6, Section 14.12, Section 14.13, Section 15.3, Section 15.5, Section 16.1, Section 16.3, Section 16.4, Section 16.5, Section 17.1, Section 17.2, Chapter 18, Section 18.7, Appendix 1, Appendix 3, Appendix 4, Appendix 5, Appendix 7, Appendix 11</p> |
| November 2019 | SH(NA)-081215ENG-X | Partial correction |
| December 2019 | SH(NA)-081215ENG-Y | <p>■Added or modified part</p> <p>Appendix 1</p> |
| February 2020 | SH(NA)-081215ENG-Z | <p>■Added or modified parts</p> <p>Section 3.2, Section 12.1, Section 12.7, Section 12.8, Section 14.1, Section 16.4, Appendix 1</p> |
| June 2020 | SH(NA)-081215ENG-AA | <p>■Added or modified parts</p> <p>SAFETY PRECAUTIONS, TERMS, Section 1.2, Section 2.1, Section 2.4, Section 2.9, Section 3.1, Section 3.2, Section 3.3, Section 3.5, Section 3.7, Section 4.2, Section 4.6, Section 5.2, Section 6.3, Section 6.4, Section 6.5, Chapter 9, Section 9.5, Section 9.6, Section 9.8, Section 11.1, Section 11.3, Section 11.4, Section 12.2, Section 13.1, Section 14.2, Section 14.4, Section 16.1, Section 16.3, Section 16.4, Section 16.5, Section 16.6, Chapter 17, Section 17.3, Section 17.4, Section 18.4, Appendix 1, Appendix 2, Appendix 3, Appendix 4, Appendix 5, Appendix 6, Appendix 8, Appendix 9, Appendix 10, Appendix 11, Appendix 12, Appendix 13</p> |
| October 2020 | SH(NA)-081215ENG-AB | <p>■Added or modified parts</p> <p>SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, Section 1.2, Section 2.1, Section 2.4, Section 3.3, Section 3.5, Section 3.7, Section 4.1, Section 4.2, Section 5.2, Section 5.4, Section 5.5, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Chapter 9, Section 9.3, Section 9.8, Section 9.9, Section 10.4, Section 11.2, Section 12.10, Section 13.1, Section 14.2, Section 14.4, Section 14.10, Section 16.1, Section 16.3, Section 17.3, Section 17.4, Section 18.7, Appendix 1, Appendix 2, Appendix 5, Appendix 8, Appendix 9, Appendix 13</p> |
| January 2021 | SH(NA)-081215ENG-AC | <p>■Added or modified parts</p> <p>TERMS, GENERIC TERMS AND ABBREVIATIONS, Section 2.5, Section 2.8, Section 3.5, Section 3.7, Section 4.2, Section 4.3, Section 4.6, Section 5.2, Section 13.1, Section 13.2, Section 16.4, Section 16.5, Chapter 17, Section 17.3, Section 17.4, Section 18.4, Appendix 1, Appendix 2</p> |
| April 2021 | SH(NA)-081215ENG-AD | <p>■Added or modified parts</p> <p>GENERIC TERMS AND ABBREVIATIONS, Section 1.8, Section 2.3, Section 2.4, Section 3.2, Section 3.3, Section 3.4, Section 3.6, Section 4.2, Section 4.3, Section 4.6, Section 5.2, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 9.1, Section 9.2, Section 9.6, Section 9.8, Section 10.1, Section 10.3, Section 11.2, Section 11.4, Section 12.2, Section 12.3, Section 13.2, Section 13.3, Section 13.6, Chapter 14, Section 14.1, Section 14.2, Section 14.3, Section 14.4, Section 14.8, Section 16.2, Section 16.5, Section 17.4, Chapter 18, Section 18.4, Section 18.7, Section 18.8, Appendix 1, Appendix 2, Appendix 7, Appendix 9, Appendix 13</p> |
| July 2021 | SH(NA)-081215ENG-AE | <p>■Added or modified parts</p> <p>Section 2.1, Section 10.1, Appendix 1</p> |

| Revision date | *Manual number | Description |
|---------------|---------------------|---|
| October 2021 | SH(NA)-081215ENG-AF | <p>■Added or modified parts</p> <p>GENERIC TERMS AND ABBREVIATIONS, Section 2.3, Section 2.4, Section 2.5, Section 2.10, Section 3.2, Section 3.4, Section 3.6, Section 4.6, Section 5.2, Section 6.1, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 9.1, Section 9.3, Section 9.4, Section 9.5, Section 9.6, Section 9.7, Section 9.8, Section 9.9, Section 10.1, Section 10.3, Section 11.1, Section 11.3, Section 12.6, Section 13.4, Section 14.1, Section 14.2, Section 14.4, Section 14.11, Section 15.2, Section 16.1, Section 16.4, Section 17.4, Appendix 1, Appendix 2, Appendix 4, Appendix 5, Appendix 7, Appendix 9, Appendix 13</p> |
| January 2022 | SH(NA)-081215ENG-AG | <p>■Added or modified parts</p> <p>Section 2.4, Section 3.2, Section 4.2, Section 13.1, Chapter 14, Section 14.1, Section 14.8, Section 15.5, Section 15.7, Section 16.5, Appendix 1, Appendix 2, Appendix 13</p> |
| April 2022 | SH(NA)-081215ENG-AH | <p>■Added or modified parts</p> <p>GENERIC TERMS AND ABBREVIATIONS, Section 2.3, Section 2.4, Section 3.3, Section 4.2, Section 6.3, Section 6.4, Section 6.7, Section 6.9, Section 10.1, Section 14.1, Section 14.4, Appendix 1, Appendix 2, Appendix 9, Appendix 13</p> |
| July 2022 | SH(NA)-081215ENG-AI | <p>■Added or modified parts</p> <p>Section 15.5, Appendix 1</p> |
| October 2022 | SH(NA)-081215ENG-AJ | <p>■Added or modified parts</p> <p>GENERIC TERMS AND ABBREVIATIONS, Section 2.4, Section 3.2, Section 3.3, Section 4.2, Section 4.6, Section 5.2, Section 6.3, Section 6.5, Section 6.6, Section 6.7, Section 6.10, Section 11.4, Section 13.1, Section 14.2, Section 14.3, Section 14.4, Section 16.5, Section 16.6, Section 17.4, Section 18.7, Appendix 1, Appendix 2, Appendix 5, Appendix 9, Appendix 13</p> |
| April 2023 | SH(NA)-081215ENG-AK | <p>■Added or modified parts</p> <p>GENERIC TERMS AND ABBREVIATIONS, Section 2.4, Section 3.2, Section 3.3, Section 3.5, Section 3.7, Section 3.8, Section 4.2, Section 5.2, Section 6.1, Section 6.3, Section 6.6, Section 6.8, Section 6.9, Section 6.10, Section 6.11, Section 9.3, Section 9.7, Section 10.3, Section 11.3, Section 12.2, Section 12.3, Section 13.1, Section 13.3, Section 13.4, Chapter 14, Section 14.1, Section 14.2, Section 14.3, Section 14.4, Section 14.8, Section 14.11, Chapter 15, Section 15.2, Section 15.5, Section 15.8, Section 16.1, Section 16.2, Section 16.5, Section 17.4, Section 18.4, Appendix 1, Appendix 2, Appendix 4, Appendix 5, Appendix 8, Appendix 9, Appendix 13</p> |
| June 2023 | SH(NA)-081215ENG-AL | <p>■Added or modified parts</p> <p>Section 3.3, Section 3.5, Section 3.7, Section 3.8, Section 6.11, Section 10.3, Section 13.1, Chapter 15, Section 15.1, Section 15.2, Section 15.8, Appendix 1, Appendix 2, Appendix 8</p> |
| October 2023 | SH(NA)-081215ENG-AM | <p>■Added or modified parts</p> <p>Section 1.9, Section 2.4, Section 2.10, Section 3.3, Section 4.2, Section 5.2, Section 6.7, Section 6.10, Section 8.3, Section 9.6, Section 9.7, Section 12.6, Section 13.1, Section 13.7, Section 14.4, Section 14.5, Section 14.13, Section 14.14, Chapter 15, Section 16.5, Section 16.6, Section 17.4, Section 18.4, Appendix 1, Appendix 2, Appendix 4, Appendix 13</p> |
| April 2024 | SH(NA)-081215ENG-AN | <p>■Added or modified parts</p> <p>GENERIC TERMS AND ABBREVIATIONS, Section 1.2, Section 2.3, Section 2.4, Section 3.3, Section 3.6, Section 3.8, Section 3.9, Section 4.1, Section 5.2, Section 5.3, Section 6.3, Section 6.4, Section 6.7, Section 6.8, Section 6.9, Section 7.5, Section 9.6, Section 9.8, Section 9.9, Section 10.3, Section 11.4, Section 13.2, Section 13.3, Section 14.2, Section 14.4, Section 14.5, Section 14.13, Section 15.5, Section 15.7, Section 17.2, Section 17.3, Section 17.4, Appendix 1, Appendix 2, Appendix 7, Appendix 8, Appendix 9, Appendix 13</p> |
| October 2024 | SH(NA)-081215ENG-AO | <p>■Added or modified parts</p> <p>Section 1.5, Section 2.1, Section 2.4, Section 3.2, Section 3.3, Section 5.3, Section 6.11, Section 9.6, Section 10.3, Section 14.2, Section 15.5, Section 15.7, Section 16.5, Section 17.4, Appendix 1, Appendix 2, Appendix 9</p> |

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