MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-R series

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

-RJ71PB91V

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the 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

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.
  (2) When the programmable controller detects an abnormal condition, it stops the operation and all outputs are:
    - Turned off if the overcurrent or overvoltage protection of the power supply module is activated.
    - Held or turned off according to the parameter setting if the self-diagnostic function of the CPU module detects an error such as a watchdog timer error.
  (3) All outputs may be turned on if an error occurs in a part, such as an I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For a fail-safe circuit example, refer to "General Safety Requirements" in the MELSEC iQ-R Module Configuration Manual.
  (4) Outputs may remain on or off due to a failure of a component such as a relay and transistor in an output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.
- In an output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.
- Configure a circuit so that the external power supply is turned off first and then the programmable controller. If the programmable controller is turned off first, an accident may occur due to an incorrect output or malfunction.
- For the operating status of each station after a communication failure, refer to manuals for the network used. For the manuals, please consult your local Mitsubishi representative. Incorrect output or malfunction due to a communication failure may result in an accident.
- When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.

[Design Precautions]

⚠WARNING

- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not write any data to the "system area" and "write-protect area" of the buffer memory in the module. Also, do not use any "use prohibited" signals as an output signal from the CPU module to each module. Doing so may cause malfunction of the programmable controller system. For the "system area", "write-protect area", and the "use prohibited" signals, refer to the user's manual for the module used. For areas used for safety communications, they are protected from being written by users, and thus safety communications failure caused by data writing does not occur.
- If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail. Failure to do so may result in an accident due to an incorrect output or malfunction. When safety communications are used, an interlock by the safety station interlock function protects the system from an incorrect output or malfunction.
- If a communication failure occurs with a PROFIBUS-DP network, the operating status of each station is as follows:
  (1) The DP-Master holds the input data when the communication failure occurs.
  (2) If the DP-Master goes down, the output status of each DP-Slave depends on the parameter setting of the DP-Master.
  (3) If a DP-Slave goes down, the output status of other DP-Slaves depends on the parameter setting of the DP-Master.

  Check the diagnostic information and configure an interlock circuit in the program to ensure that the entire system will operate safely. Failure to do so may result in an accident due to an incorrect output or malfunction.
- The assignments of I/O signals and buffer memory areas differ depending on whether the RJ71PB91V is used as the DP-Master or a DP-Slave. Configure an interlock circuit in the program to ensure that the program does not run with the incorrect station type.

[Design Precautions]

⚠WARNING

- If a stop error occurs in the CPU module, the operating status of the DP-Master is as follows.
  In a redundant system, however, the operation is the same as when "CPU Error Output Mode Setting" is set to "Hold" regardless of its setting value.
  (1) When "CPU Error Output Mode Setting" is set to "Clear"
    - I/O data exchanges with DP-Slaves are interrupted.
    - Output data in the buffer memory of the DP-Master are cleared and not sent.
    - Input data which have been received from DP-Slaves when a stop error occurs in the CPU module are held in the buffer memory of the DP-Master.

  (2) When "CPU Error Output Mode Setting" is set to "Hold"
    - I/O data exchanges with DP-Slaves are continued.
    - Output data which have been stored in the buffer memory of the DP-Master when a stop error occurs in the CPU module are held and sent to DP-Slaves.
    - Data in the buffer memory of the DP-Master are updated with input data received from DP-Slaves.
- If a stop error occurs in the CPU module, the operating status of DP-Slaves is as follows:
  (1) When "CPU Error Output Mode Setting" is set to "Clear"
    - Input data to be sent from DP-Slaves to the DP-Master are cleared.
    - Output data which have been received from the DP-Master when a stop error occurs in the CPU module are held in the buffer memory of DP-Slaves.

  (2) When "CPU Error Output Mode Setting" is set to "Hold"
    - Input data to be sent from DP-Slaves to the DP-Master when a stop error occurs in the CPU module are held.
    - Output data which have been received from the DP-Master when a stop error occurs in the CPU module are held in the buffer memory of DP-Slaves.

[Design Precautions]

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Doing so may result in malfunction due to electromagnetic interference. Keep a distance of 100mm or more between those cables.
- During control of an inductive load such as a lamp, heater, or solenoid valve, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Therefore, use a module that has a sufficient current rating.
- After the CPU module is powered on or is reset, the time taken to enter the RUN status varies depending on the system configuration, parameter settings, and/or program size. Design circuits so that the entire system will always operate safely, regardless of the time.
- Do not power off the programmable controller or reset the CPU module while the settings are being written. Doing so will make the data in the flash ROM and SD memory card undefined. The values need to be set in the buffer memory and written to the flash ROM and SD memory card again. Doing so also may cause malfunction or failure of the module.
- When changing the operating status of the CPU module from external devices (such as the remote RUN/STOP functions), select "Do Not Open by Program" for "Opening Method" of "Module Parameter". If "Open by Program" is selected, an execution of the remote STOP function causes the communication line to close. Consequently, the CPU module cannot reopen the line, and external devices cannot execute the remote RUN function.

[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.

[Installation Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in electric shock or cause the module to fail or malfunction.

[Installation Precautions]

⚠CAUTION

- Use the programmable controller in an environment that meets the general specifications in the Safety Guidelines (IB-0800525). Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount a module, place the concave part(s) located at the bottom onto the guide(s) of the base unit, and push in the module until the hook(s) located at the top snaps into place. Incorrect interconnection may cause malfunction, failure, or drop of the module.
- To mount a module with no module fixing hook, place the concave part(s) located at the bottom onto the guide(s) of the base unit, push in the module, and fix it with screw(s). Incorrect interconnection may cause malfunction, failure, or drop of the module.
- When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
- Tighten the screws within the specified torque range. Undertightening can cause drop of the component or wire, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction. For the specified torque range, refer to the MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup).
- When using an extension cable, connect it to the extension cable connector of the base unit securely. Check the connection for looseness. Poor contact may cause malfunction.
- When using an SD memory card, fully insert it into the SD memory card slot. Check that it is inserted completely. Poor contact may cause malfunction.
- Securely insert an extended SRAM cassette or a battery-less option cassette into the cassette connector of the CPU module. After insertion, close the cassette cover and check that the cassette is inserted completely. Poor contact may cause malfunction.
- Beware that the module could be very hot while power is on and immediately after power-off.
- Do not directly touch any conductive parts and electronic components of the module, SD memory card, extended SRAM cassette, battery-less option cassette, or connector. Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before installation and wiring. Failure to do so may result in electric shock or cause the module to fail or malfunction.
- After installation and wiring, attach a blank cover module (RG60) to each empty slot before powering on the system for operation. Also, attach an extension connector protective cover[*1] to each unused extension cable connector as necessary. Directly touching any conductive parts of the connectors while power is on may result in electric shock.
  *1 For details, please consult your local Mitsubishi Electric representative.

[Wiring Precautions]

⚠CAUTION

- Individually ground the FG and LG terminals of the programmable controller with a ground resistance of 100 ohms or less. Failure to do so may result in electric shock or malfunction.
- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Check the rated voltage and signal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause fire or failure.
- Connectors for external devices must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered. Incomplete connections may cause short circuit, fire, or malfunction.
- Securely connect the connector to the module. Poor contact may cause malfunction.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Doing so may result in malfunction due to noise. Keep a distance of 100mm or more between those cables.
- Place the cables in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in malfunction or damage to modules or cables.
  In addition, the weight of the cables may put stress on modules in an environment of strong vibrations and shocks.
  Do not clamp the extension cables with the jacket stripped. Doing so may change the characteristics of the cables, resulting in malfunction.
- Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the module and external device.
- Tighten the terminal screws or connector screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, fire, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, fire, or malfunction.

[Wiring Precautions]

⚠CAUTION

- When disconnecting the cable from the module, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. For the cable connected to the terminal block, loosen the terminal screw. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- When a protective film is attached to the top of the module, remove it before system operation. If not, inadequate heat dissipation of the module may cause a fire, failure, or malfunction.
- Programmable controllers must be installed in control panels. Connect the main power supply to the power supply module in the control panel through a relay terminal block. Wiring and replacement of a power supply module must be performed by qualified maintenance personnel with knowledge of protection against electric shock. For wiring, refer to the MELSEC iQ-R Module Configuration Manual.
- For Ethernet cables to be used in the system, select the ones that meet the specifications in the user's manual for the module used. If not, normal data transmission is not guaranteed.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Correctly connect the battery connector. Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire. Also, do not expose it to liquid or strong shock. Doing so will cause the battery to produce heat, explode, ignite, or leak, resulting in injury and fire.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws, connector screws, or module fixing screws. Failure to do so may result in electric shock.
  Antistatic Precautions Before Using MELSEC iQ-R Series Products (FA-A-0368)

[Startup and Maintenance Precautions]

⚠CAUTION

- When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the programmable controller. Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
- Tighten the screws within the specified torque range. Undertightening can cause drop of the component or wire, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- After the first use of the product, do not perform each of the following operations more than 50 times (IEC 61131-2/JIS B 3502 compliant).
  Exceeding the limit may cause malfunction.
  - Mounting/removing the module to/from the base unit
  - Inserting/removing the extended SRAM cassette or battery-less option cassette to/from the CPU module
  - Mounting/removing the terminal block to/from the module
  - Connecting/disconnecting the extension cable to/from the base unit
- After the first use of the product, do not insert/remove the SD memory card to/from the CPU module more than 500 times. Exceeding the limit may cause malfunction.
- Do not touch the metal terminals on the back side of the SD memory card. Doing so may cause malfunction or failure of the module.
- Do not touch the integrated circuits on the circuit board of an extended SRAM cassette or a battery-less option cassette. Doing so may cause malfunction or failure of the module.
- Do not drop or apply shock to the battery to be installed in the module. Doing so may damage the battery, causing the battery fluid to leak inside the battery. If the battery is dropped or any shock is applied to it, dispose of it without using.

[Startup and Maintenance Precautions]

⚠CAUTION

- Startup and maintenance of a control panel must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel so that only qualified maintenance personnel can operate it.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Wearing a grounded antistatic wrist strap is recommended. Failure to discharge the static electricity may cause the module to fail or malfunction.
- After unpacking, eliminate static electricity from the module to prevent electrostatic discharge from affecting the module. If an electrostatically charged module comes in contact with a grounded metal object, a sudden electrostatic discharge of the module may cause failure.
  For details on how to eliminate static electricity from the module, refer to the following.
  Antistatic Precautions Before Using MELSEC iQ-R Series Products (FA-A-0368)
- Use a clean and dry cloth to wipe off dirt on the module.

[Operating Precautions]

⚠CAUTION

- When changing data and operating status, and modifying program of the running programmable controller from an external device such as a personal computer connected to an intelligent function module, read relevant manuals carefully and ensure the safety before operation. Incorrect change or modification may cause system malfunction, damage to the machines, or accidents.
- Do not power off the programmable controller or reset the CPU module while the setting values in the buffer memory are being written to the flash ROM in the module. Doing so will make the data in the flash ROM and SD memory card undefined. The values need to be set in the buffer memory and written to the flash ROM and SD memory card again. Doing so can cause malfunction or failure of the module.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.
- When disposing of batteries, separate them from other wastes according to the local regulations. For details on battery regulations in EU member states, refer to the MELSEC iQ-R Module Configuration Manual.

[Transportation Precautions]

⚠CAUTION

- When transporting lithium batteries, follow the transportation regulations. For details on the regulated models, refer to the MELSEC iQ-R Module Configuration Manual.
- The halogens (such as fluorine, chlorine, bromine, and iodine), which are contained in a fumigant used for disinfection and pest control of wood packaging materials, may cause failure of the product. Prevent the entry of fumigant residues into the product or consider other methods (such as heat treatment) instead of fumigation. The disinfection and pest control measures must be applied to unprocessed raw wood.

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 Mitsubishi Electric MELSEC iQ-R series programmable controllers.
This manual describes the procedures, system configuration, and wiring of the relevant product listed below.
Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the MELSEC iQ-R series programmable controller to handle the product correctly.
When applying the program examples provided in this manual to an actual system, ensure the applicability and confirm that it will not cause system control problems.
Please make sure that the end users read this manual.

Relevant product

RJ71PB91V

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R PROFIBUS-DP Module User's Manual (Application) [SH-081857ENG] (this manual)	Functions, parameter settings, PROFIBUS Configuration Tool, programming, troubleshooting, I/O signals, and buffer memory of the PROFIBUS-DP module	Print book e-Manual PDF
MELSEC iQ-R Module Configuration Manual [SH-081262ENG]	The combination of the MELSEC iQ-R series modules, common information on the installation/wiring in the system, and specifications of the power supply module, base unit, SD memory card, and battery	Print book e-Manual PDF
MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup) [SH-081855ENG]	Specifications, procedures before operation, system configuration, wiring, and communication examples of the PROFIBUS-DP module	Print book e-Manual PDF
MELSEC iQ-R PROFIBUS-DP Module Function Block Reference [BCN-P5999-0914]	Specifications of the MELSEC iQ-R series PROFIBUS-DP module FBs	e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configuration, parameter settings, and online operations of GX Works3	e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- The hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Backup mode	A mode to continue operation in a redundant system. This mode can continue the operation by switching the systems from the control system to the standby system when an error occurs in the control system.
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 system	A system that controls a redundant system and performs network communications in a redundant system.
Device	A memory of a CPU module to store data. Devices such as X, Y, M, D, and others are provided depending on the intended use.
Diagnostic information	Diagnostic information of PROFIBUS-DP detected from the DP-Master or notified from a DP-Slave.
DP-Master	A device name when the RJ71PB91V is used as the DP-Master (Class 1). This device exchanges I/O data with DP-Slaves.
DP-Master (Class 1)	A device (such as a general master station that uses a PROFIBUS-DP module) that exchanges I/O data with DP-Slaves.
DP-Master (Class 2)	A device (such as a personal computer) that communicates with DP-Slaves to check the FDL address setting and the operating status. This device is capable of performing start-up, maintenance, and diagnostics of the network as the DP-Master for network control.
DP-Slave	A device that exchanges I/O data with the DP-Master (Class 1)
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance
Extended diagnostic information	Diagnostic information specific to each DP-Slave. A DP-Slave notifies the DP-Master of an error detection.
FDL address	The numbers assigned to a DP-Master and DP-Slaves The FDL address is set within the range from 0 to 125.
Global label	A label that is valid for all the program data when multiple program data are created in the project. There are two types of global label: a module specific label (module label), which is generated automatically by GX Works3, and an optional label, which can be created for any specified device.
GSD database	The database that batch manages information of the module with the registered GSD file. Use when the module is set with PROFIBUS Configuration Tool.
GSD file	The file that is written the parameters of a DP-Slave. Use this file to set slave parameters with PROFIBUS Configuration Tool that supports the DP-Master used.
Ident No.	The number of each module to connect a PROFIBUS-DP network. The number is written to the GSD file of each module.
Intelligent function module	A module that has functions other than input and output, such as an A/D converter module and D/A converter module
Module label	A label that represents one of memory areas (I/O signals and buffer memory areas) specific to each module in a given character string. For the module used, GX Works3 automatically generates this label, which can be used as a global label.
New control system	A system that has switched to control system from standby system after system switching
New standby system	A system that has switched to standby system from control system after system switching
Process CPU	A CPU module that performs process control and sequence control. Process control function blocks and the online module change function can be executed. This module is also used with a redundant function module as a pair and configures a redundant system.
Process CPU (redundant mode)	A Process CPU operating in redundant mode. A redundant system is configured with this CPU module. Process control function blocks and the online module change function can be used even in this mode.
PROFIBUS-DPV0	Basic version of PROFIBUS-DP. This version can be executed the I/O data exchange function or other functions.
PROFIBUS-DPV1	Version of PROFIBUS-DP that contains the following functions in addition to the basic functions of PROFIBUS-DPV0. • Acyclic communication function • Alarm acquisition function
PROFIBUS-DPV2	Version of PROFIBUS-DP that contains the time control over DP-Slaves or other functions in addition to the functions of PROFIBUS-DPV1.
Redundant function module	A module to configure a redundant system by using it in combination with a process CPU (redundant mode).
Redundant system	A system consisting of two systems that have same configuration (CPU module, power supply module, network module, and other modules). Even after an error occurs in one of the two system, the other system takes over the control of the entire system.
Redundant system with redundant extension base unit	A redundant system that is configured using extension base unit(s)

Term	Description
Separate mode	A mode for system maintenance in a redundant system. This mode can maintain a redundant system without stopping control while the system is running.
Standby system	A backup system in a redundant system
System A	A system that is set as system A to distinguish two systems in a redundant system. It is used to distinguish connected two systems (system A and system B).
System B	A system that is set as system B to distinguish two systems in a redundant system. It is used to distinguish connected two systems (system A and system B).
System switching	A function which switches the systems between the control system and the standby system to continue operation of the redundant system when a failure or an error occurs in the control system.
Time master	The DP-Master can send a request of time control
Tracking cable	An optical fiber cable used to connect two redundant function modules in a redundant system

GENERIC TERMS AND ABBREVIATIONS

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

Generic term/abbreviation	Description
ACK	An abbreviation for ACKnowledgement. This signal is sent to inform the sending side that the data transfer has been normally completed.
Both systems	A generic term for systems A and B or for the control and standby systems.
DUT	An abbreviation for Data Unit Type. This term is defined by the international standard IEC 61131. DUT has the same meaning as the structure used in the engineering tool.
Remote head module	An abbreviation for the RJ72GF15-T2 CC-Link IE Field Network remote head module.
UTC	An abbreviation for Coordinated Universal Time. The time is added to leap time to adjust the time difference with GMT (Greenwich Mean Time)

1 FUNCTIONS

The RJ71PB91V supports the following functions.

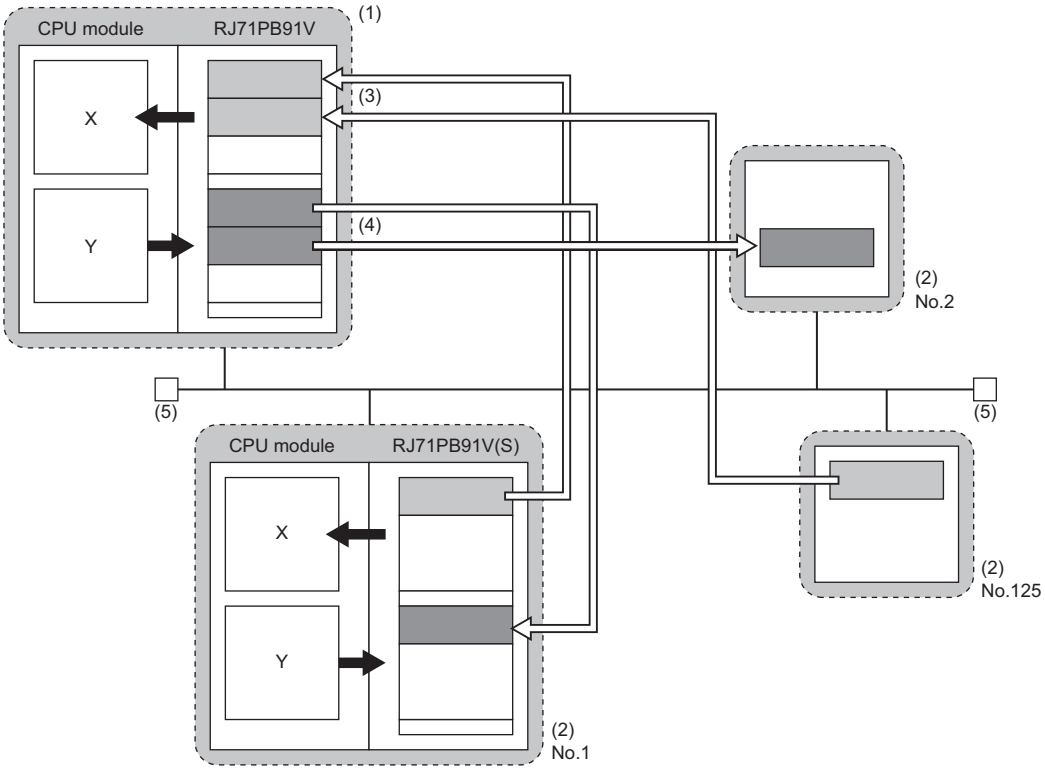
PROFIBUS-DP version	Function		Reference	Station type
PROFIBUS-DPV0	I/O data exchange function		Page 21 I/O Data Exchange Function	DP-Master DP-Slave
PROFIBUS-DPV0	Check of diagnostic information	Acquisition of diagnostic information and extended diagnostic information	Page 24 Acquisition of diagnostic information and extended diagnostic information	DP-Master
PROFIBUS-DPV0		Notification function of extended diagnostic information	Page 26 Notification function of extended diagnostic information	DP-Slave
PROFIBUS-DPV0	Global control function		Page 28 Global Control Function	DP-Master DP-Slave
PROFIBUS-DPV1	Acyclic communication function		Page 31 Acyclic Communication Function	DP-Master
PROFIBUS-DPV1	Alarm acquisition function		Page 34 Alarm Acquisition Function	DP-Master
PROFIBUS-DPV2	Time control over DP-Slaves		Page 36 Time Control over DP-Slaves	DP-Master
—	Data swap function		Page 37 Data Swap Function	DP-Master DP-Slave
—	Data consistency function		Page 39 Data Consistency Function	DP-Master DP-Slave
—	Output setting function for CPU stop error		Page 41 Output Setting Function for CPU Stop Error	DP-Master DP-Slave
—	Temporarily reserved station specification function		Page 44 Temporarily Reserved Station Specification Function	DP-Master
—	Operation mode changing function		Page 45 Operation Mode Changing Function	DP-Master DP-Slave
—	FDL address setting function		Page 76 Set Slave Address	DP-Master
PROFIBUS-DPV0	Communications with DP-Master (Class 2)	I/O data read function	Page 47 I/O data read function	DP-Slave
PROFIBUS-DPV0		Read function of I/O configuration information	Page 47 Read function of I/O configuration information	DP-Slave
PROFIBUS-DPV0		FDL address changing function	Page 48 FDL address changing function	DP-Slave
—	Redundant system function		Page 49 Redundant System Function	DP-Master

Point

- To use functions of the PROFIBUS-DPV1 or the PROFIBUS-DPV2, use the DP-Master or DP-Slaves that support the corresponding version. (📖 Manual for the DP-Master or DP-Slave used)
- To use functions of the PROFIBUS-DPV1 or the PROFIBUS-DPV2, set MSI (Min. slave interval), the minimum required time for polling cycle, to a value larger than the total of Pt (Polling time), Tsdi (the RJ71PB91V request/response processing time ÷ transmission speed[bps]), and Lr (Data refresh time). If MSI is shorter than the total of Pt, Tsdi, and Lr, processing the functions may take longer time. (☞ Page 272 Bus cycle time)

1.1 I/O Data Exchange Function

This function exchanges I/O data between a DP-Master and DP-Slaves.



(1) DP-Master (Class 1)
(2) DP-Slave
(3) Input data
(4) Output data
(5) Bus terminator

Point

For a program example of the I/O data exchange function, refer to the following.

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

I/O data exchanges on DP-Master

This section describes I/O data exchanges on the RJ71PB91V used as the DP-Master.

Reading/writing I/O data from/to the CPU module

■Buffer Memory

I/O data are read/written between the devices of the CPU module and the buffer memory of the RJ71PB91V.

- Input data: 'Input data area (for mode 3)' (Un\G6144 to Un\G10239)
- Output data: 'Output data area (for mode 3)' (Un\G14336 to Un\G18431)

■Read/write method

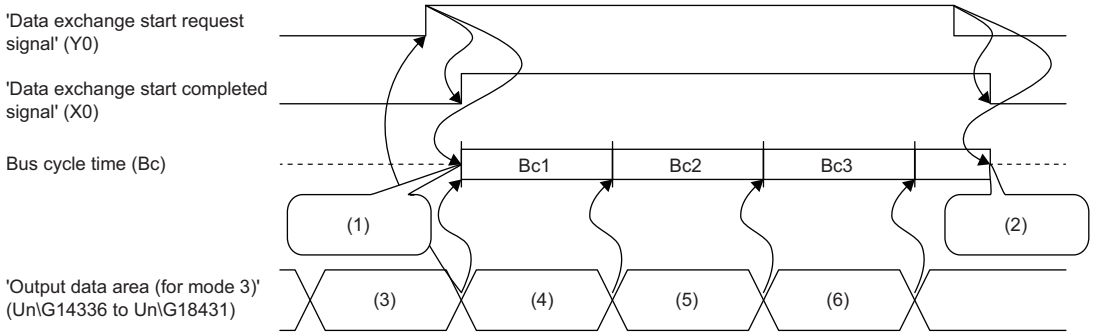
I/O data are read/written between the devices of the CPU module and the buffer memory of the RJ71PB91V by using one of the following methods.

Item	Method	Data consistency
Refresh Setting	PROFIBUS Configuration Tool	Available
MOV instruction or FROM/TO instructions	Program	Unavailable

Starting/stopping I/O data exchanges with DP-Slave

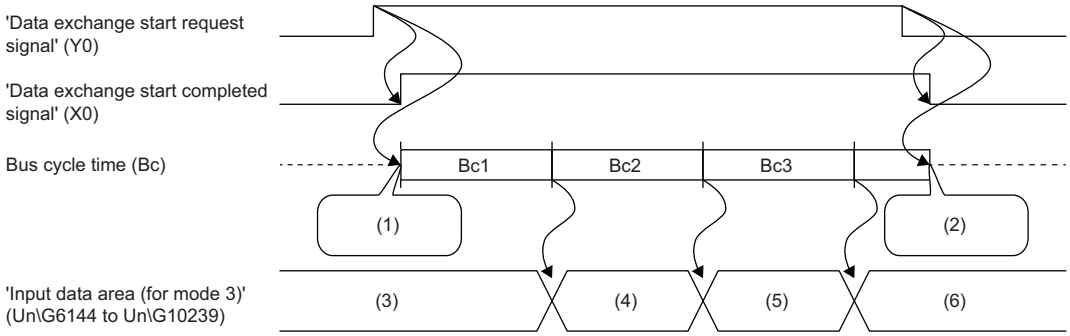
1. Write the initial values of output data to 'Output data area (for mode 3)' (Un\G14336 to Un\G18431).
2. Turn on 'Data exchange start request signal' (Y0).
3. Turn on 'Data exchange start request signal' (Y0) and I/O data exchanges start, 'Data exchange start completed signal' (X0) turns on.
4. The input data from the DP-Slaves are stored in 'Input data area' (for mode 3) (Un\G6144 to Un\G10239).
5. Turn off 'Data exchange start request signal' (Y0), 'Data exchange start completed signal' (X0) turns off, and I/O data exchanges stop.

- Output data communication



(1) I/O data exchanges start
(2) I/O data exchanges stop
(3) Output data at Bc1 (initial value)
(4) Output data at Bc2
(5) Output data at Bc3
(6) Output data at Bc4

- Input data communication



(1) I/O data exchanges start
(2) I/O data exchanges stop
(3) Data from the last data exchanges
(4) Input data at Bc1
(5) Input data at Bc2
(6) Input data at Bc3

I/O data exchanges with DP-Slaves

This section describes I/O data exchanges on the RJ71PB91V used as a DP-Slave.

Reading/writing I/O data from/to the CPU module

■Buffer Memory

I/O data are read/written between the devices of the CPU module and the buffer memory of the RJ71PB91V.

- Input data: "Input send area" (Un\G256 to Un\G447)
- Output data: "Output receive area" (Un\G0 to Un\G191)

■Read/write method

I/O data are read/written between the devices of the CPU module and the buffer memory of the RJ71PB91V by using one of the following methods.

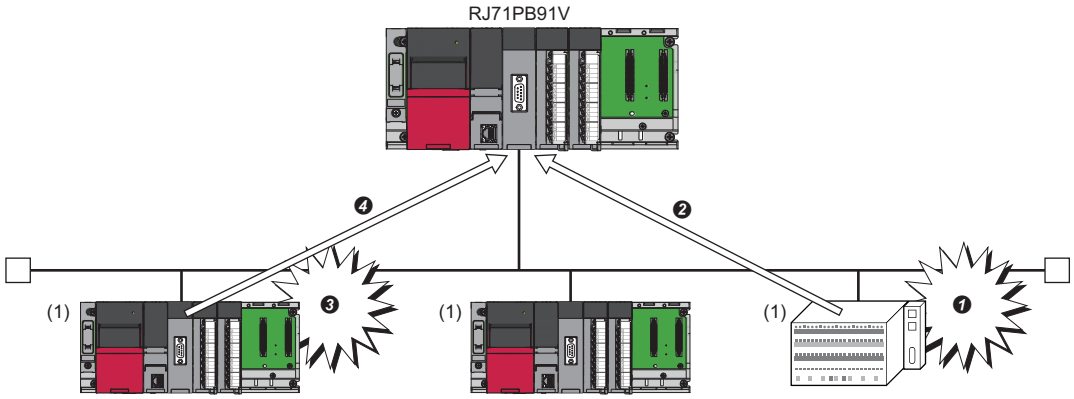
Item	Method	Data consistency
Refresh Setting	Parameter settings in the engineering tool	Available
MOV instruction or FROM/TO instructions	Program	Unavailable

Starting/stopping I/O data exchanges with DP-Master

1. When communication with the DP-Master becomes ready, 'During data exchange signal' (X1) turns on.
2. When 'During data exchange signal' (X1) turns on, output data from the DP-Master is stored in 'Output receive area' (Un\G0 to Un\G191).
3. To start I/O data exchanges, turn on 'Input send area refresh instruction signal' (Y0).
4. To stop I/O data exchanges, turn off 'Input send area refresh instruction signal' (Y0).
5. 'During data exchange signal' (X1) turns off when the communication with the DP-Master is stopped.

1.2 Check of Diagnostic Information

Check the diagnostic information and extended diagnostic information issued on DP-Slaves during I/O data exchanges by using the buffer memory and I/O signals.



(1) DP-Slave
❶ Communications error occurs
❷ DP-Slave sends diagnostic information to buffer memory of DP-Master.
❸ Extended communications error occurs
❹ DP-Slave notifies DP-Master of extended diagnostic information.

Acquisition of diagnostic information and extended diagnostic information

Acquire the diagnostic information and extended diagnostic information on the DP-Master. (☞ Page 138 Program example of the acquisition of diagnostic information, Page 140 Program example of the acquisition of extended diagnostic information)

1. Check if diagnostic information is generated.
   - BF LED turns on.
   - 'Diagnostic information detection signal' (X1) turns on.
2. Check which DP-Slave sent the diagnostic information. (☞ Page 24 How to check if diagnostic information occurs)
3. Store the diagnostic information sent from the DP-Slave to the buffer memory of the RJ71PB91V. (☞ Page 24 Acquisition of diagnostic information)
4. Check whether that occurrence of extended diagnostic information has been notified from DP-Slave. (☞ Page 25 How to check if extended diagnostic occurs)
5. Read the extended diagnostic information stored in the buffer memory on the DP-Slave to the buffer memory on the DP-Master. (☞ Page 25 Acquisition of extended diagnostic information from the target DP-Slave)
6. Check the error cause which acquired from the diagnostic information and extended diagnostic information and take necessary action.

Acquisition of diagnostic information

■How to check if diagnostic information occurs

Occurrence status of diagnostic information of each DP-Slave is stored in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) on the DP-Master.

For stations that sent diagnostic information, the relevant bit of 'Each station's diagnostic status' (Un\G23057 to Un\G23064) is turned on.

■Acquisition of diagnostic information

Acquire the diagnostic information of DP-Slaves from 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) on the DP-Master.

Acquisition of extended diagnostic information

■How to check if extended diagnostic occurs

To check if extended diagnostic information has been stored in DP-Slaves, check the status 1 information of each DP-Slave stored in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) on the DP-Master.

Ex.

For the first DP-Slave, check b11 of 'Diagnostic information area (1st station)' (Un\G23073).

■Acquisition of extended diagnostic information from the target DP-Slave

Acquire the extended diagnostic information of the target DP-Slave and save it to the DP-Master by the following procedure. (☞ Page 235 Acquisition of extended diagnostic information)

1. Write the FDL address for the DP-Slave from which to acquire extended diagnostic information to 'Extended diagnostic information read request area' (Un\G23456).
2. Turn on 'Extended diagnostic information read request signal' (Y6).
3. When the extended diagnostic information is read completely, 'Extended diagnostic information read response signal' (X6) turns on and the extended diagnostic information is stored in 'Extended diagnostic information read response area' (Un\G23457 to Un\G23583) on the DP-Master.
4. After checking the acquired extended diagnostic information, turn off 'Extended diagnostic information read request signal' (Y6).

Point

The latest extended diagnostic information of all DP-Slaves is stored in 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454) on the DP-Master.

Notification function of extended diagnostic information

When a system error occurs in a DP-Slave, this function notifies the DP-Master of the error using the extended diagnostic information (data defined optionally). (☞ Page 158 Program example of notification request of extended diagnostic information)
In addition, when the DP-Slave recovers from the error, the correction of the error is notified to the DP-Master.

Error detection notification and error correction notification

■Error detection notification

The following describes the procedure to notify the DP-Master of an error detected on a DP-Slave using the extended diagnostic information.

1. Set the data length and data (of up to 24 bytes) of the extended diagnostic information in 'Extended diagnostic information area' (Un\G2041 to Un\G2053) using a program.
2. Turn on 'Extended diagnostic information notification request signal' (Y2) using a program.
3. The extended diagnostic information (other than 0) is sent to the DP-Master when the turning on of 'Extended diagnostic information notification request signal' (Y2) is detected.
4. 'Extended diagnostic information notification completed signal' (X2) turns on and the DIA LED turns on.

When the DP-Master receives the extended diagnostic information (other than 0) from a DP-Slave, the following operation is performed on the DP-Master.

- Bit 11 of status 1 for the corresponding DP-Slave turns on in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321).
- Data is stored in 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454).
- The DIA LED turns on.

Precautions

- While the DIA LED is on, the DP-Slave responds the extended diagnostic information whenever the DP-Master makes an extended diagnostic information read request.
- To turn off the DIA LED, send the error correction notification to the DP-Master, reset the CPU module of the DP-Slave, or power off and on the system.
- When the error is corrected after the error detection is notified, send the error correction notification to the DP-Master.

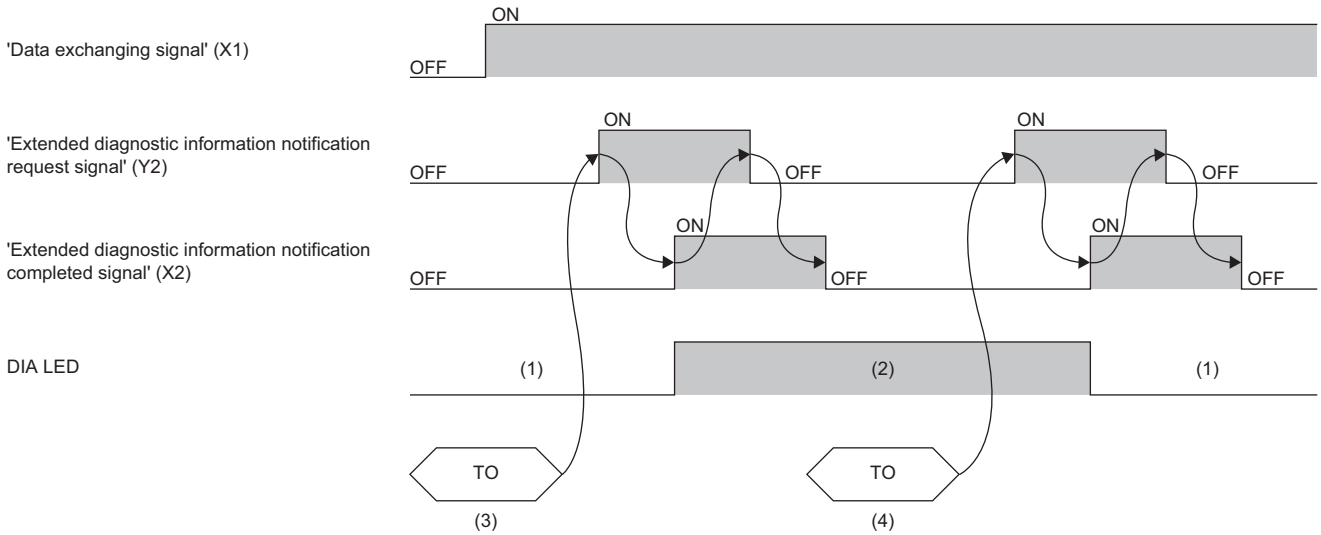
■Error correction notification

The following describes the procedure to notify the DP-Master of the extended diagnostic information about completion of error correction on the DP-Slave.

1. Set 0 to the data length of 'Extended diagnostic information area' (Un\G2041 to Un\G2053) by using a program.
2. Turn on 'Extended diagnostic information notification request signal' (Y2) using a program.
3. The extended diagnostic information (0) is sent to the DP-Master when the turning on of 'Extended diagnostic information notification request signal' (Y2) is detected.
4. 'Extended diagnostic information notification completed signal' (X2) turns on and the DIA LED goes off.

When 'Diagnostic information area clear request signal' (Y2) is turning on while the DP-Master receives the extended diagnostic information (0) from a DP-Slave, the operation on the DP-Master is the following.

- Bit 11 of status 1 for the corresponding DP-Slave turns off in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321).
- The DIA LED turns off if all DP-Slaves have no extended diagnostic information and no alarm.

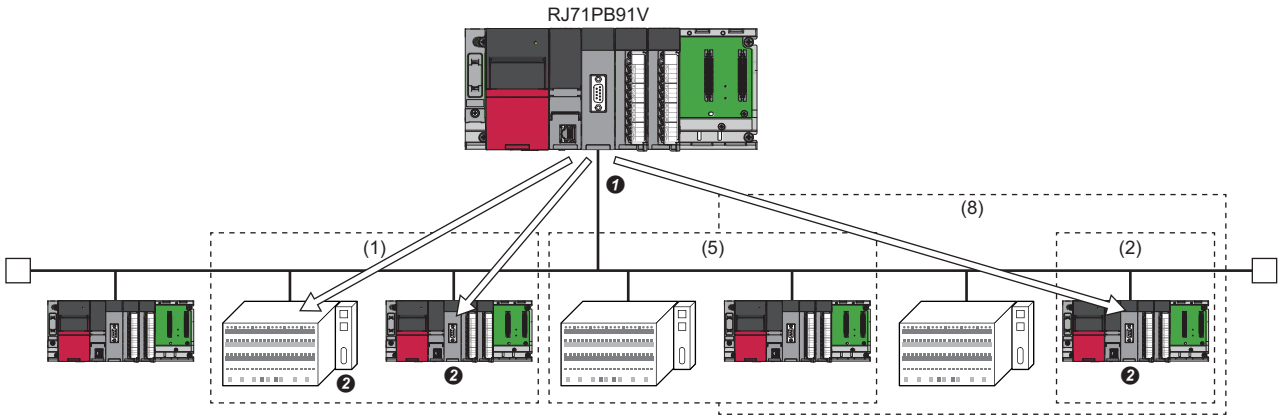


(1) Off
(2) On
(3) Set a value other than 0 to the data length of 'Extended diagnostic information area' (Un\G2041 to Un\G2053).
(4) Set 0 to the data length of 'Extended diagnostic information area' (Un\G2041 to Un\G2053).

1.3 Global Control Function

This function is used to simultaneously control DP-Slaves that belong to the specified group to hold/clear the I/O data by sending the service via multicast (simultaneous broadcast) from the DP-Master.
The DP-Slaves that belong to the specified group automatically hold/clear the I/O data according to the received service.

Ex.
When output data is simultaneously changed by sending the SYNC service from the DP-Master to the DP-Slaves that belong to Group 1 and Group 2



(1) Group 1
(2) Group 2
(5) Group 5
(8) Group 8
❶ To send the SYNC service, set groups of the DP-Slaves on the DP-Master and select Groups 1, 2, and the SYNC service from a program.
❷ The three DP-Slaves go into the SYNC mode when receiving the SYNC service and hold output data. The output data of the three DP-Slaves are simultaneously changed when the three DP-Slaves receive the SYNC service during the SYNC mode.

Precautions

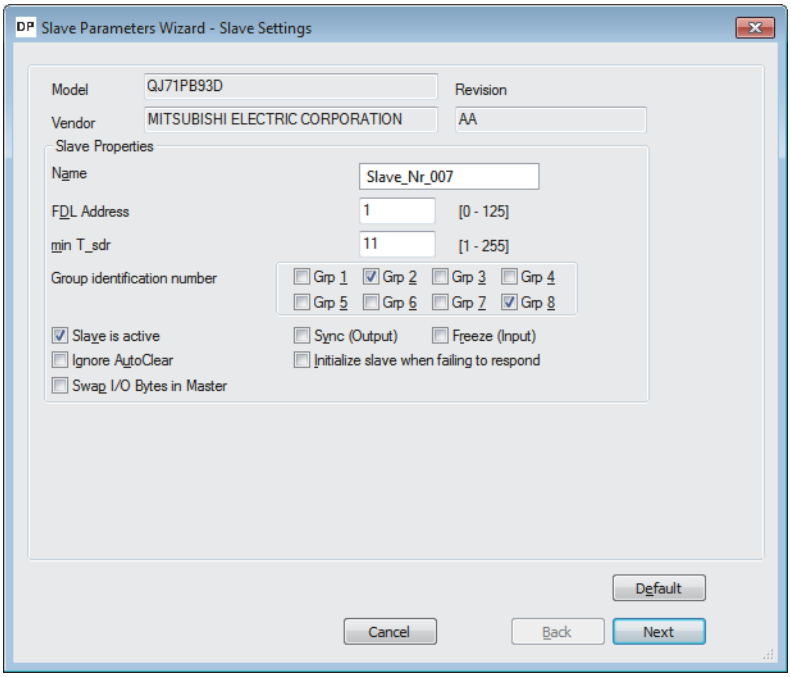
The global control function cannot execute with the acyclic communication function.

Configuring groups

Configure groups by "Group identification number" in the "Slave Settings" window in PROFIBUS Configuration Tool on the DP-Master. (☞ Page 113 Slave Settings)

A maximum of eight groups, "Grp 1" to "Grp 8", are available.

One DP-Slave can be assigned with multiple groups.



Global control function services

The global control function has the following services:

- SYNC/UNSYNC services: Used to simultaneously change output data of multiple DP-Slaves.
- FREEZE/UNFREEZE services: Used to simultaneously acquire input data of multiple DP-Slaves.

The DP-Slaves that belong to the specified group automatically operate as follows according to the service received from the DP-Master.

■SYNC service

1. The DP-Slaves go into the SYNC mode when receiving the SYNC service from the DP-Master. During this mode, 'Output receive area' (Un\G0 to Un\G191) is held and is not updated by output data from the DP-Master.
2. When the SYNC service is received from the DP-Master during the SYNC mode, 'Output receive area' (Un\G0 to Un\G191) is updated only once by output data from the DP-Master.

The input data sent from 'Input send area' (Un\G256 to Un\G447) to the DP-Master is updated even during the SYNC mode.

■UNSYNC service

The DP-Slaves exit the SYNC mode when receiving the UNSYNC service from the DP-Master.

■FREEZE service

1. The DP-Slaves go into the FREEZE mode when receiving the FREEZE service from the DP-Master. During this mode, 'Input send area' (Un\G256 to Un\G447) is held, and input data to the DP-Master is not updated.
2. When the FREEZE service is received from the DP-Master during the FREEZE mode, input data sent from 'Input send area' (Un\G256 to Un\G447) to the DP-Master is updated only once.

'Output receive area' (Un\G0 to Un\G191) is updated by output data from the DP-Master even during FREEZE mode.

■UNFREEZE service

The DP-Slaves exit the FREEZE mode when receiving the UNFREEZE service from the DP-Master.

Execution of the global control function

Execute the global control function on the DP-Master by the following procedure.

1. Write services to send and target groups to 'Global control area' (Un\G2081).
2. Turn on 'Global control request signal' (Y4).
3. When the global control processing is completed, 'Global control completed signal' (X4) turns on. If the processing was completed with an error, 'Global control failed signal' (X5) turns on.
4. Check that the global control processing has been completed and then turn off 'Global control request signal' (Y4).

Point

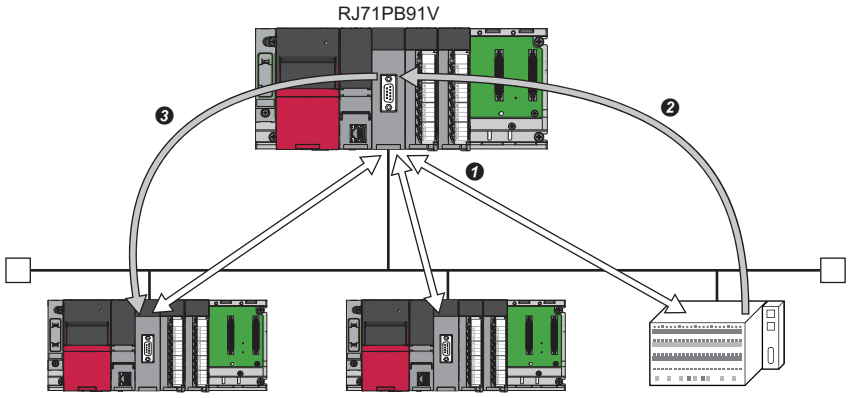
- To execute the global control function to all the DP-Slaves (including those without a group number), set 0 to all of b8 to b15 of 'Global control area' (Un\G2081).
- For a program example of the global control function, refer to the following.

☞ Page 143 Program example of the global control function

On a DP-Slave that has received a service, the I/O signals turn on or off depending on which service the DP-Slave has received. (☞ Page 211 Global control functions (X5), (X6), and (X7))

1.4 Acyclic Communication Function

This function enables the DP-Master to read/write data from/to DP-Slaves at a different timing from the I/O data exchanges. A maximum of eight requests can be issued.



❶ I/O data exchanges
❷ Data reading from a DP-Slave
❸ Data writing to a DP-Slave

Precautions

The acyclic communication function cannot execute with the global control function or time control over DP-Slaves.

Services available on the DP-Master

Acyclic communication falls into two types of services: Class 1 and Class 2 services.

Services available vary depending on whether or not the target DP-Slaves are exchanging I/O data.

○: Available, ×: Not available

Target DP-Slave	Available services	
	Class 1 service	Class 2 service
DP-Slaves exchanging I/O data	○	○
DP-Slaves not exchanging I/O data	×	○

■Class 1 service

Before executing a Class 1 service, check 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) to see that relevant bits of the DP-Slave are turned on.

Service name	Description
READ (Class1) service	Reads data from a specified DP-Slave.*1
WRITE (Class1) service	Writes data to a specified DP-Slave.*1

*1 Data that can be read/written by READ (Class1) or WRITE (Class1) service differs depending on the DP-Slave used. (📖 Manual for the DP-Slave)

■Class 2 service

Establish a connection to DP-Slaves by INITIATE (Class2) service before executing READ (Class2) or WRITE (Class2) service.

To stop acyclic communications, disconnect DP-Slaves by ABORT (Class2) service.

To execute a Class 2 service for DP-Slaves that are exchanging I/O data, check 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) for whether bits relevant to the targets are on before executing the service.

To execute a Class 2 service for DP-Slaves that are not exchanging data, before executing the service, check that DP-Slaves have started. (📖 Manual for the DP-Slave)

Service name	Description
INITIATE (Class2) service	Establishes a connection to a specified DP-Slave.
ABORT (Class2) service	Disconnects a connection to a specified DP-Slave.
READ (Class2) service	Reads data from a DP-Slave that is connected by INITIATE (Class2) service.*1
WRITE (Class2) service	Writes data to a DP-Slave that is connected by INITIATE (Class2) service.*1

*1 Data that can be read/written by READ (Class2) or WRITE (Class2) service differs depending on the DP-Slave used. (📖 Manual for the DP-Slave)

Execution of acyclic communication function

Execute the acyclic communication function by the following procedure.

1. Set the request instruction data (request code or FDL address) to 'Acyclic communication request area' (Un\G23809 to Un\G24832) using a request format. (☞ Page 241 Request instructions of acyclic communication function)
2. Turn on bits of 'Acyclic communication request execution instruction area' (Un\G23808) that are relevant to the request instruction numbers to execute.
3. When the RJ71PB91V accepts the acyclic communication request instructions, the acceptance statuses of 'Acyclic communication request result area' (Un\G25120) turns on.
4. When acyclic communication is completed, the request execution completed statuses of 'Acyclic communication request result area' (Un\G25120) turns on and the request execution result is stored in 'Acyclic communication response area' (Un\G25121 to Un\G26144). (☞ Page 244 Execution result of acyclic communication function)
5. Turn off bits of 'Acyclic communication request execution instruction area' (Un\G23808) that are relevant to the request instruction numbers to execute.
6. When acyclic communication is completed, the request acceptance status and request execution completion status of 'Acyclic communication request result area' (Un\G25120) turn off.

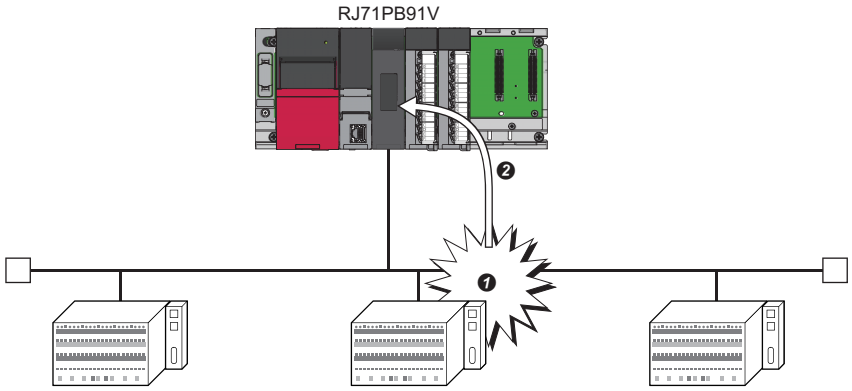
Point

- Communications with DP-Slaves may be initialized if a problematic cable or noise causes a problem to the communications during a Class 1 service. (Input and output are turned off)
- For a program example of the acyclic communication function, refer to the following.

☞ Page 146 Program example of acyclic communication (acyclic communication)

1.5 Alarm Acquisition Function

The alarm acquisition function acquires alarms or the status information occurring to DP-Slaves on the DP-Master.
A maximum of eight pieces of information can be acquired for a DP-Slave.



❶ An alarm occurs
❷ An alarm or status information is acquired

Requests available on the DP-Master

Alarms can be acquired by the following two methods.

- An Alarm read request (without ACK) or Alarm ACK request can be used
- Using Alarm read request (with ACK)

■An Alarm read request (without ACK) or Alarm ACK request can be used

Use an Alarm read request (without ACK) when an interval is required until ACK is returned after an alarm is acquired from a DP-Slave.
Alarm ACK request enables returning of ACK for each acquired alarm.

1. An alarm occurs.
2. Acquire the alarm from the DP-Slave. (Alarm read request (without ACK))
3. Take action against the cause of the problem occurring to the DP-Slave.
4. Return ACK for the alarm that has been resolved. (Alarm ACK request)

■Using Alarm read request (with ACK)

Use Alarm read request (with ACK) to automatically return ACK to all acquired alarms after acquiring the alarms from the DP-Slave. (☞ Page 149 Program example of the alarm acquisition function)

1. An alarm occurs.
2. Acquire the alarm from the DP-Slave and return ACK to all alarms. (Alarm read request (with ACK))
3. Take action against the cause of the problem occurring to the DP-Slave.

Execution of the alarm acquisition function

Execute the alarm acquisition function (Alarm read request (without ACK) and Alarm ACK request) by the following procedure.

1. When an alarm occurs, the DIA LED turns on and bit corresponding to the DP-Slave where the alarm is occurring turns on in 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424).
2. Write Alarm read request (without ACK) to 'Alarm request area' (Un\G26432 to Un\G26434) (☞ Page 250 Alarm acquisition function (request))
3. Turn on 'Alarm read request signal' (Y18).
4. Alarms are acquired and the results are stored in 'Alarm response area' (Un\G26446 to Un\G26768). (☞ Page 251 Normal response format when the alarm is read (without ACK))
5. 'Alarm read response signal' (X18) turns on. Check the alarm stored in 'Alarm response area' (Un\G26446 to Un\G26768) and turn off 'Alarm read request signal' (Y18).
6. Write Alarm ACK request to 'Alarm request area' (Un\G26432 to Un\G26434).
7. Turn on 'Alarm read request signal' (Y18).
8. ACK is returned and the results are stored in 'Alarm response area' (Un\G26446 to Un\G26768). (☞ Page 253 Normal response format for alarm ACK)
9. If ACK is returned for all alarms of the DP-Slave, the corresponding bit in 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424) and the DIA LED turn off. If ACK is not returned for some alarms, the corresponding bit and the DIA LED remain on.
10. 'Alarm read response signal' (X18) turns on. Check the alarm stored in 'Alarm response area' (Un\G26446 to Un\G26768) and turn off 'Alarm read request signal' (Y18).

■Turning off of DIA LED

The DIA LED turns off when ACK is returned for all alarms if all of the following conditions are met.

- Bits of all DP-Slaves are off in 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424).
- Bit 11 is off for status 1 in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321).

However, the DIA LED does not turn off if an alarm or extended diagnostics is generated in another DP-Slave.

■Turning off of BF LED

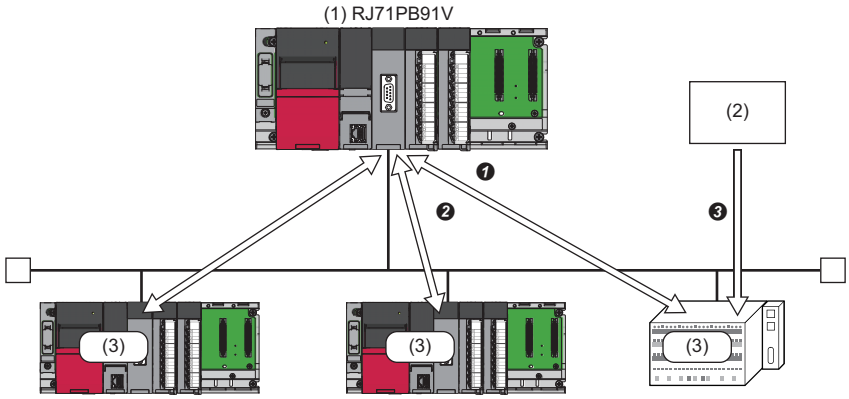
The BF LED turns off when ACK is returned for all alarms if all of the following conditions are met.

- Bits of all DP-Slaves are off in 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424).
- Bits of all DP-Slaves are off in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064).

If ACK is not returned for all alarms, BF LED turns off when bits of all DP-Slaves are off in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064), regardless of the alarm detection status.

1.6 Time Control over DP-Slaves

The DP-Master makes the time setting of DP-Slaves as a time master.
In addition, the DP-Master acquires the time setting of DP-Slaves that is made by other time masters.



(1) Time master 1
(2) Time master 2
(3) Clock data
❶ Time write request
❷ Time read request
❸ Time setting

Precautions

Time control over DP-Slaves cannot execute with the acyclic communication function.

Requests available on the DP-Master

■Write request

Request name	Description
Time write request	Writes clock data of specified year, month, day, hour, minute, and second. The clock data can be set at 6:28:16 AM on February 7, 2036.
UTC write request	Writes clock data in UTC seconds (year + month + day + hour + minute + second). The setting value 9DFF4400H indicates 0:0:0 AM on January 1, 1984.

■Read request

Request name	Description
Time read request	Requests for reading to the RJ71PB91V which the clock data written to the DP-Slave from other time master. This request is used when multiple time masters are present.

Execution of time control over DP-Slaves

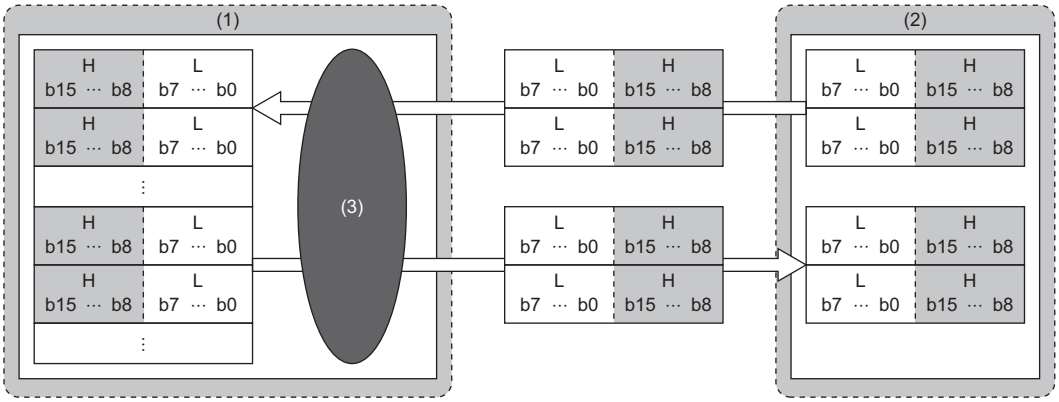
Execute the time control over DP-Slaves by the following procedure.

1. Write request data in 'Time control setting request area' (Un\G26784 to Un\G26792). (☞ Page 259 Time control over DP-Slaves (request))
2. Turn on 'Time control start request signal' (Y19).
3. Completing the time control over DP-Slaves causes the result to be stored in 'Time control setting response area' (Un\G26800 to Un\G26812) and 'Time control start response signal' (X19) to turn on. (☞ Page 261 Time control over DP-Slaves (response))
4. Check the result stored in 'Time control setting response area' (Un\G26800 to Un\G26812) and turn off 'Time control start request signal' (Y19).

1.7 Data Swap Function

This function swaps the upper byte and lower byte of exchanged data in units of words when I/O data are sent/received.
This function is used when the word configuration of I/O data is different (upper and lower bytes are reversed) between the DP-Master and DP-Slaves.
This function enables I/O data exchanges by swapping the upper and lower bytes without creating a program for the processing.

Ex.
When the data swap function is enabled on the DP-Master and the upper and lower bytes of I/O data from the DP-Slave are reversed



(1) DP-Master
(2) DP-Slave
(3) Data swap processing
H: Upper byte, L: Lower byte

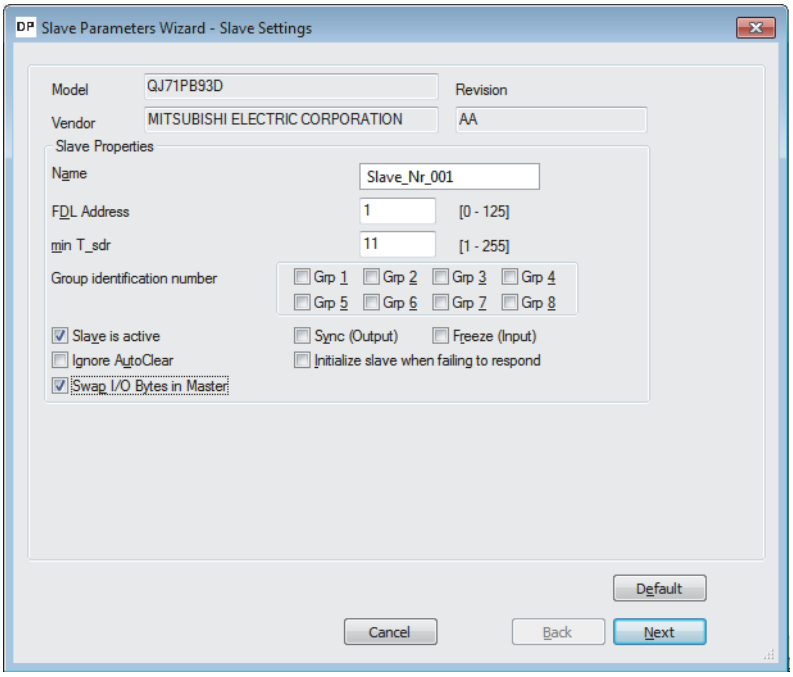
Data swap function setting

For the combination of the RJ71PB91V used as the DP-Master and the RJ71PB91V used as the DP-Slave, disable (default) the data swap function on both modules or enable it on both modules.

■When the RJ71PB91V used as the DP-Master is connected to the DP-Slave having different word configuration

Set the data swap function in the "Slave Settings" window in PROFIBUS Configuration Tool on the DP-Master. (☞ Page 113 Slave Settings)

Check "Swap I/O Bytes in Master" for each DP-Slave to which the swap function is applied.



■When the RJ71PB91V used as the DP-Slave is connected to the DP-Master having different word configuration

Set the data swap function in the slave parameters in the configuration tool on the DP-Master used. (☞ Page 69 Slave parameter settings on DP-Master)

1.8 Data Consistency Function

This function maintains consistency of I/O data read/written from/to the buffer memory.

Data inconsistency is an issue where new and old two-word size (32 bits) link data, such as a current value of a positioning module, is divided in units of words (16 bits) at the timing of refresh of I/O data.

I/O data consistency and occurrence

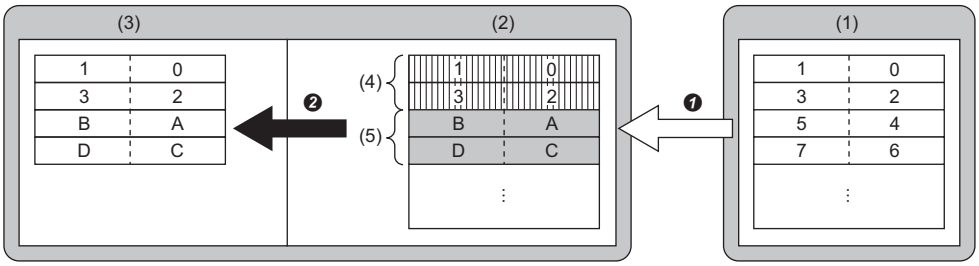
■Without the data consistency function

The PROFIBUS-DP bus cycle is asynchronous with the sequence scan by the CPU module.

Therefore, consistency of data on the DP-Master will not be maintained in the following example.

Ex.

When the data is read from the CPU module while the input data is being transferred from the DP-Slave to the buffer memory on the DP-Master



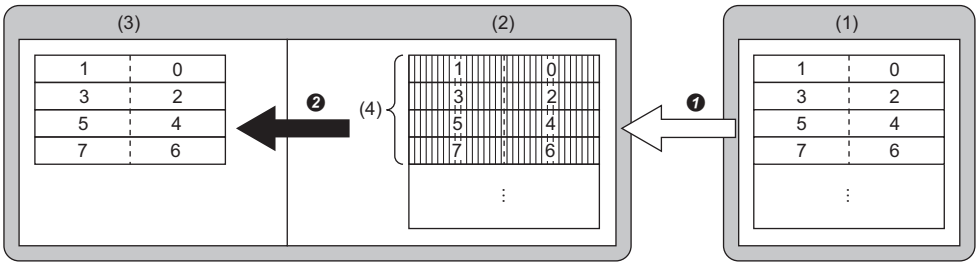
(1) DP-Slave
(2) Buffer memory of the DP-Master
(3) CPU module of the DP-Master
(4) Area that has already updated with data transferred from a DP-Slave
(5) Area that has not updated with data transferred from a DP-Slave
❶ Data being transferred
❷ Data read while transferred

Similarly to the above example, consistency of data will not be maintained in I/O data processing on the DP-Slave.

■With the data consistency function

When the data consistency function is used, reading of data from the CPU module is not performed while the data is being transferred from the DP-Slave to the buffer memory of the DP-Master (Input data area). When the data transfer has completed, reading of data starts.

In addition, transfer of data to the DP-Slave is not performed until the data has been written completely from the CPU module to the buffer memory of the DP-Master (Output data area). When the data writing has completed, transfer of data starts.



(1) DP-Slave
(2) Buffer memory of the DP-Master
(3) CPU module of the DP-Master
(4) Area that has already updated with data transferred from a DP-Slave
❶ Data transfer completed
❷ Data read after transferred

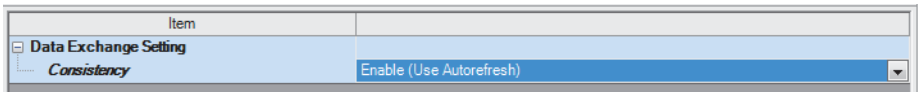
How to activate the data consistency function

Enable the data consistency function.

■For the DP-Master

Set "Data consistency" to "Enable (Use Autorefresh)" in the settings below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Module Parameter] ⇨ [Basic Setting]

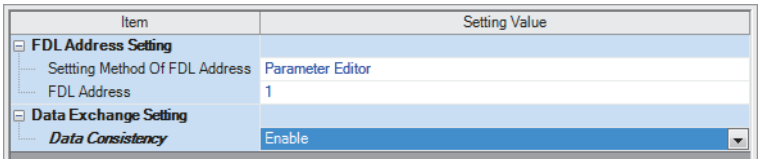


Enable the refresh settings when enabling the data consistency function. (☞ Page 110 CPU Device Access)

■For the DP-Slave

Set "Data Consistency" to "Enable" in the setting below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Basic Setting]



Enable the refresh settings to enable the data consistency function. (☞ Page 66 Module parameter)

Precautions

- The data consistency function requires waiting time to read/write data from/to CPU module or to transfer data of DP-Master and DP-Slave, which results in longer transmission delay time.
- The data consistency function is unavailable for executing refresh between the buffer memory of the RJ71PB91V and the CPU module with the MOV instruction or FROM/TO instructions.

Restriction

The data consistency function restricts firmware versions of the supported CPU modules and remote head modules. (☞ Page 291 Restricted functions of the CPU module)
If the versions of the module used are not supported, disable the data consistency function and refresh setting.

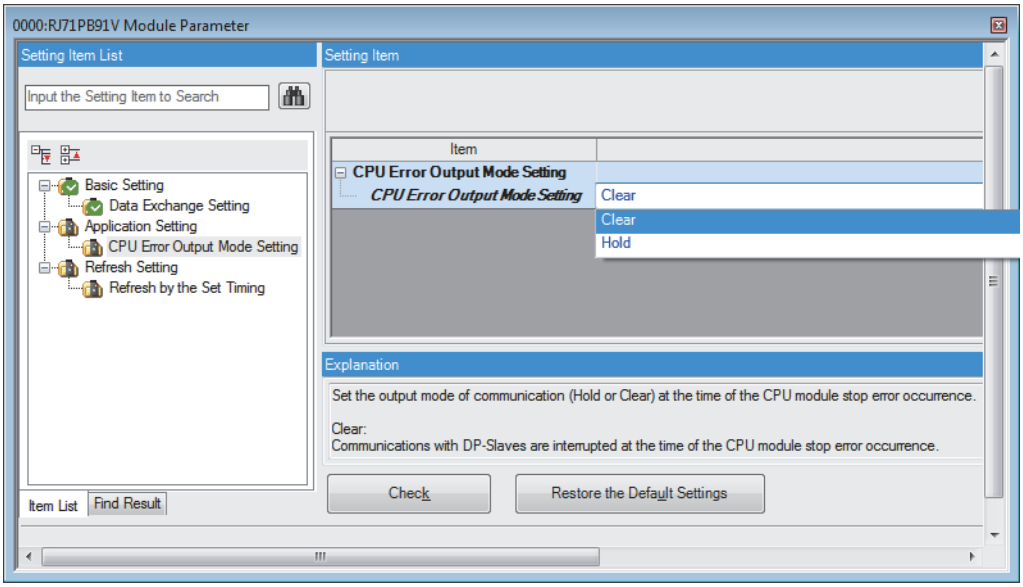
1.9 Output Setting Function for CPU Stop Error

This function sets the handling of I/O data when a CPU stop error occurs on the CPU module to which the RJ71PB91V is mounted.

Settings for DP-Master

Set the output setting function for a CPU stop error as follows on the DP-Master.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Module Parameter] ⇨ [Application Setting]



When "Clear" is selected for "CPU Error Output Mode Setting"

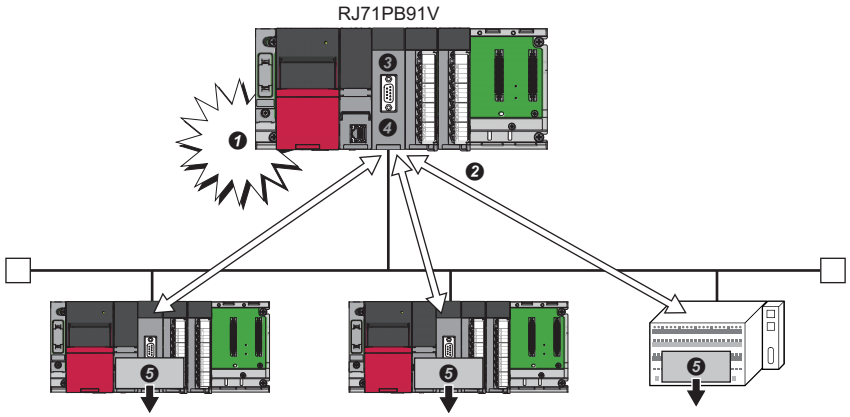
- I/O data exchanges with the DP-Slave are interrupted.
- The output data of the RJ71PB91V buffer memory is cleared and is not sent.
- Input data that was already received from the DP-Slave when the CPU module stop error occurred is held in the RJ71PB91V buffer memory.

Point

Data output after I/O data exchanges are stopped may be output from the DP-Slave to an external device depending on the settings of the DP-Slave. (Manual for the DP-Slave)

When "Hold" is selected for "CPU Error Output Mode Setting"

- I/O data exchanges with the DP-Slave continue.
- The output data in the buffer memory of the RJ71PB91V are held when the CPU module stop error occurs and the data is sent to the DP-Slaves.
- The buffer memory of the RJ71PB91V is updated with the input data received from the DP-Slave.

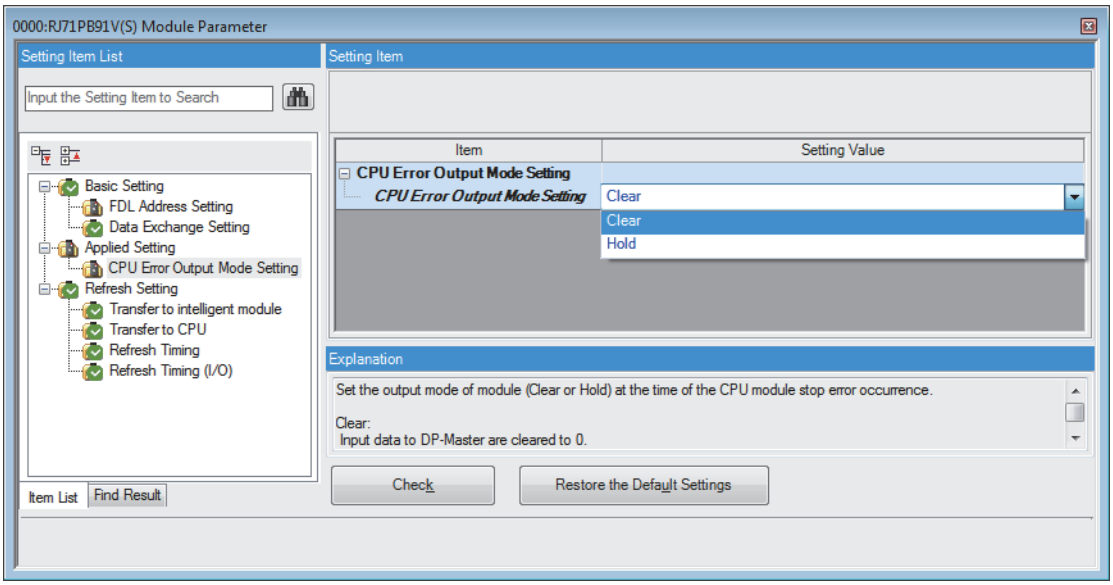


❶ A CPU stop error occurs
❷ I/O data exchanges continue
❸ For the output data in the buffer memory, the value stored at the occurrence of the CPU module stop error is held
❹ The buffer memory is updated by the input data from the DP-Slaves
❺ The output data before the CPU stop error occurs is held

Settings for DP-Slaves

Set the output setting function for a CPU stop error on the DP-Slave as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Applied Setting]

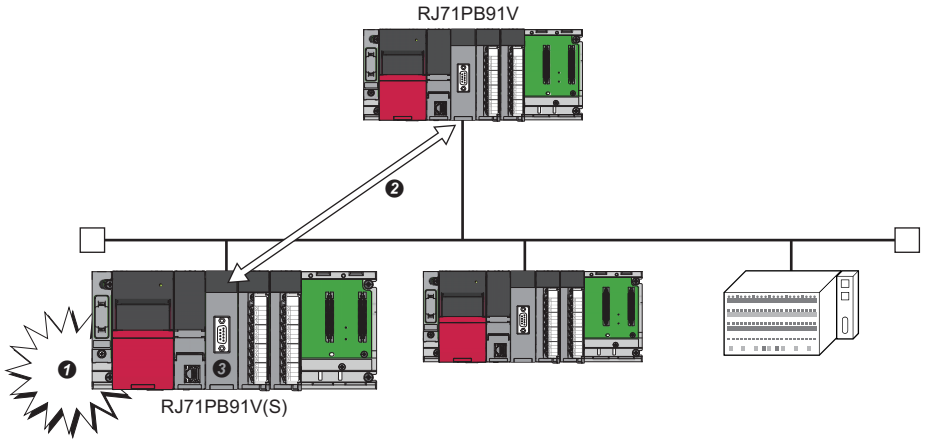


When "Clear" is selected for "CPU Error Output Mode Setting"

- The input data sent from the RJ71PB91V to the DP-Master is cleared.
- The output data received from the DP-Master at the occurrence of the CPU module stop error is held in the buffer memory on the RJ71PB91V.

When "Hold" is selected for "CPU Error Output Mode Setting"

- For the input data in the buffer memory sent from the RJ71PB91V to the DP-Master, the value at the occurrence of the CPU module stop error is held.
- The output data received from the DP-Master at the occurrence of the CPU module stop error is held in the buffer memory on the RJ71PB91V.



❶ A CPU stop error occurs
❷ I/O data exchanges
❸ For the I/O data in the buffer memory, the value stored at the occurrence of the CPU module stop error is held

1.10 Temporarily Reserved Station Specification Function

This function can be used to switch a DP-Slave to a temporarily reserved station when the DP-Slave from network is isolated temporarily.
A temporarily reserved station can be changed easily since changing the slave parameter in PROFIBUS Configuration Tool is not required.

Point

For the RJ71PB91V to reflect the settings for the temporarily reserved station specification function, suspend data exchange and then turn off and on 'Data exchange start request signal' (Y0) when module is in communication mode (mode 3).

DP-Slaves that can be switched

- DP-Slaves can be switched into temporarily reserved stations.
- Temporarily reserved stations can be switched into DP-Slaves.
- Reserved station (Unchecked DP-Slaves in "Slave is active" of "Slave Settings" window) cannot be switched into a DP-Slave or temporarily reserved station. (☞ Page 113 Slave Settings)

Point

DP-Slaves which are checked in "Slave is active" in "Slave Settings" window support the temporarily reserved station specification function.
The corresponding DP-Slaves can be checked in 'Parameter setting status area (Active station)' (Un\G23584 to Un\G23591).

Setting and clearing temporarily reserved stations

Execute the temporarily reserved station specification function by the following procedure. (☞ Page 237 Temporarily reserved station specification function)

■Setting method

1. Set the DP-Slaves to switch into temporarily reserved stations as 'Temporarily reserved station specification request area' (Un\G23608 to Un\G23615).
2. Turn on 'Data exchange start request signal' (Y0).
3. When temporarily reserved stations have been specified, the result is stored in 'Temporarily reserved station specification status area' (Un\G23600 to Un\G23607) and 'Data exchange start completed signal' (X0) turns on.

■Clearing method

1. Turn off 'Data exchange start request signal' (Y0).
2. Clear temporarily reserved stations of the specified DP-Slaves on 'Temporarily reserved station specification request area' (Un\G23608 to Un\G23615).
3. Turn on 'Data exchange start request signal' (Y0).
4. When temporarily reserved stations have been cleared the result is stored in 'Temporarily reserved station specification status area' (Un\G23600 to Un\G23607) and 'Data exchange start completed signal' (X0) turns on.

Point

The reserved stations specified by the current slave parameters and temporarily reserved stations specified by the temporarily reserved station specification function can be checked in 'Slave status area (Reserved station setting)' (Un\G23048 to Un\G23055).

1.11 Operation Mode Changing Function

This section describes operation modes and procedure for changing operation modes of the RJ71PB91V.

Point

When the parameters are written to the DP-Master with PROFIBUS Configuration Tool, operation mode is changed as follows.

- While parameters are written: Parameter setting mode (mode 1)
- After parameters are written: Communication mode (mode 3)

Operation mode type

The following table lists operation modes of the RJ71PB91V.

Operation mode	Description	Station type
Normal operation mode (mode 0)	Operates DP-Slaves using parameters distributed from the DP-Master. The operation mode is not saved to the flash ROM, and therefore the module starts up automatically in the normal operation mode (mode 0) when the CPU module is reset or the system is powered off and on.	DP-Slave
Parameter setting mode (mode 1)	Activates when the parameters set in PROFIBUS Configuration Tool are written to the DP-Master. When the PROFIBUS communications parameter (module extension parameter) is not written to the CPU module or the SD memory card of CPU module, activate the module in this operation mode and error code: 1806 appears.	DP-Master
Self-diagnostic mode (mode 2)	Performs a unit test on the RJ71PB91V. (☞ Page 174 Self-diagnostic Test)	DP-Master DP-Slave
Communication mode (mode 3)	Performs I/O data exchanges between DP-Master and DP-Slaves. When the PROFIBUS communications parameter (module extension parameter) is written to the CPU module or the SD memory card of CPU module, activate the module in this operation mode.	DP-Master
Flash ROM clear mode (mode 9→mode F→mode A)	Initialization and test of the flash ROM are performed. (☞ Page 174 Initialization of flash ROM)	DP-Master DP-Slave

For the operation mode changing function, the mode cannot be changed into parameter setting mode (mode 1) and communication mode (mode 3).

Procedure for changing operation modes

1. Write the value for the desired operation mode to 'Operation mode change request area' (Un\G2255).
2. Turn on 'Operation mode change request signal' (Y11).
3. Operation mode is changed and the result is stored in 'Operation mode change result area' (Un\G2256).Then 'Operation mode change completed signal' (X11) turns on.
4. Check that the following have been stored in 'Operation mode change result area' (Un\G2256) and turn off 'Operation mode change request signal' (Y11).

- DP-Master: A300H (completed successfully)
- DP-Slave: 0000H (completed successfully)

5. Turn off 'Operation mode change request signal' (Y11) and 'Operation mode change completed signal' (X11) turns off.

Operation mode change completed with an error

When operation mode change is completed with an error, the following are stored in 'Operation mode change result area' (Un\G2256).

- DP-Master: Status code (☞ Page 185 List of Status Codes)
- DP-Slave: 0001H

Precautions for changing operation mode

■When operation mode change is requested during data exchange

- DP-Master: Change of the operation mode is executed after 'Data exchange start completed signal' (X0) turns off and the I/O data exchanges stop.
- DP-Slave: Change of the operation mode is executed after 'During data exchange signal' (X1), 'During SYNC mode signal' (X5), 'SYNC receive signal' (X6), and 'During FREEZE mode signal' (X7) turn off and the data exchanges stop.

The data exchange restarts when the operation mode on the DP-Slave is switched into the normal operation mode (mode 0). If a request made before the operation mode change remains in the buffer memory or input signal, the request may be executed immediately after the data exchange restarts. Clear any request made before the operation mode change to prevent an unintended execution of the request.

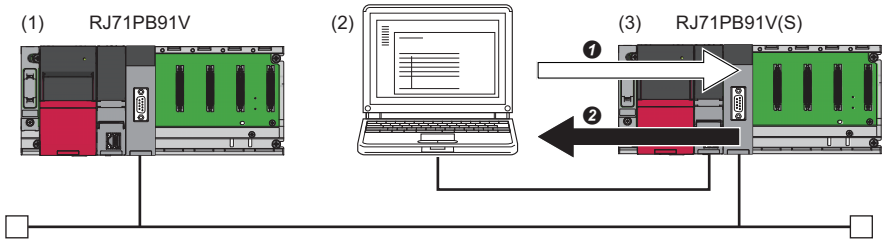
■When operation mode cannot be changed

The operation mode cannot be changed while the DP-Master is processing the following functions or the following state. After E302H is stored in 'Operation mode change result area' (Un\G2256), execute the operation mode change again.

- Acquisition of extended diagnostic information
- Global control function
- Acyclic communication function
- Alarm acquisition function
- Time Control over DP-Slaves
- When the reflection timing of the PROFIBUS module setting is set to "after writing to CPU" (☞ Page 64 PROFIBUS module setting)

1.12 Communications with DP-Master (Class 2)

The DP-Master (Class 2), such as a personal computer, is capable of controlling and diagnosing complicated network systems. The following functions can be used when DP-Slaves are connected to the DP-Master (Class 2).



(1) DP-Master (Class 1)
(2) DP-Master (Class 2)
(3) DP-Slave
❶ The DP-Master (Class 2) sends a read request of the I/O data or I/O configuration information to DP-Slaves.
❷ The DP-Slaves send the I/O data or I/O configuration information to the DP-Master (Class 2).

I/O data read function

When the request from the DP-Master (Class 2) (RD_Outp/RD_Inp) is executed for the diagnosis of the PROFIBUS-DP network or other purposes, the I/O data can be read from DP-Slaves.
Because DP-Slaves automatically respond to the request from the DP-Master (Class 2), the processing or setting using a program or parameters is not required.

Read function of I/O configuration information

When the request from the DP-Master (Class 2) (Get_Cfg) is executed for the diagnosis of the PROFIBUS-DP network or other purposes, the I/O configuration information can be read from DP-Slaves.
Because DP-Slaves automatically respond to the request from the DP-Master (Class 2), the processing or setting using a program or parameters is not required.

FDL address changing function

FDL address of the DP-Slave can be changed at the request from the DP-Master (Class 2) (Set_Slave_Add).
In addition, the FDL address of the DP-Slave can be changed or cleared using a program.
To see whether the current operation FDL address can be changed or not, check 'DP-Slave FDL address change availability status area' (Un\G517).

FDL address at startup

The FDL address operated at the startup of the DP-Slave is determined based on the setting in the engineering tool.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V(S)] ⇨ [Basic Setting] ⇨ [Setting Method Of FDL Address]

FDL address setting method	FDL address at startup
Information Saved In Module	The DP-Slave operates at the FDL address saved to the flash ROM (the FDL address set from the DP-Master (Class 2)). When the FDL address is not saved to the flash ROM, the FDL address is not set.
Parameter Editor	The DP-Slave operates at the FDL address set in "FDL Address".

Change method

The items that can be changed and the operation of the DP-Slave vary as follows depending on the change method of the FDL address.

Method	Item	Operation of DP-Slave	Remarks
DP-Master (Class 2)	Change of FDL address (change of FDL address not prohibited)	• Operation FDL address is changed. • The FDL address is saved to the flash ROM.	—
	Change of FDL address (change of FDL address prohibited)	• Operation FDL address is changed. • The FDL address is saved to the flash ROM. • Further changes of the FDL address cannot be made.	Change of the FDL address is not prohibited when "Setting Method Of FDL Address" is set to "Parameter Editor" in the engineering tool.
Program	FDL address change (not saved to the flash ROM)	• Operation FDL address is changed.	The changed FDL address is not saved, and therefore the change is canceled when the CPU module is reset or the system is powered off.
	FDL address change (saved to the flash ROM)	• Operation FDL address is changed. • The FDL address is saved to the flash ROM.	—
	FDL address clear	• FDL address setting is cleared. • The FDL address saved to the flash ROM is cleared. • Prohibition of the change of the FDL address is canceled.	—

When the FDL address is changed using multiple methods or when multiple items of the FDL address are changed, the change process is executed in the reception order on the DP-Slave.

Precautions

In the following cases, the FDL address cannot be changed and saved to the flash ROM.

- When the request is improper, for example, an invalid FDL address is specified (Error code: 18C1H)
- When the FDL address is changed by the DP-Master (Class 2) or a program and the change of the FDL address is prohibited on the DP-Slave (Error code: 18C5H) To cancel prohibition of change of the FDL address, clear the FDL address from a program.
- When "Setting Method Of FDL Address" is set to "Parameter Editor" in the engineering tool (Error code: 18C6H) However, the FDL address can be changed (not saved to the flash ROM) from a program.
- When 'Count of rewriting FDL address in the flash ROM' (Un\G516) is 0 (Error code: 18C7H) However, the FDL address can be changed (not saved to the flash ROM) or cleared from a program.

1.13 Redundant System Function

The redundant system function enhances system reliability as it supports redundant system using the RJ71PB91V so that the new control system will continue I/O data exchanges even if the control system has an error.
When the RJ71PB91V is mounted on an extension base unit in a redundant system with redundant extension base unit, refer to the following.
☞ Page 290 Using the Module in the Redundant System with Redundant Extension Base Unit

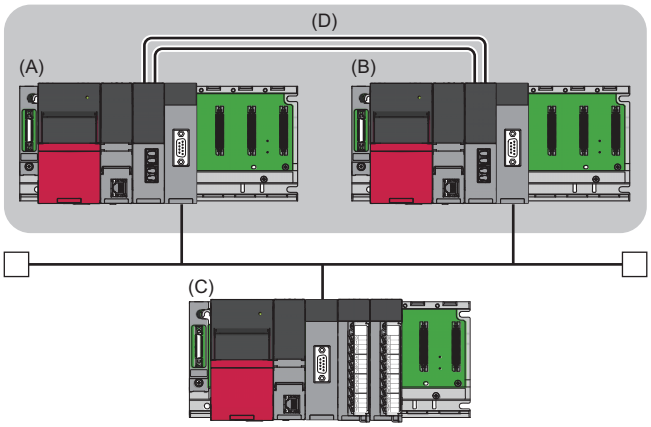
Restriction

Use the following when using the redundant system function.
- Process CPU
- Redundant function module
- DP-Master using the firmware version "04" or later of the RJ71PB91V
- Engineering tool (Version: 🕮 MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup))

Check the firmware version of the process CPU when using the redundant system. (🕮 MELSEC iQ-R CPU Module User's Manual (Application))

System configuration

This section describes the redundant system of the PROFIBUS-DP network.
The tracking transfer is performed by connecting the DP-Master of the control system (A) and the DP-Master of the standby system (B) with a tracking cable (D). (🕮 MELSEC iQ-R CPU Module User's Manual (Application))
When an error occurs in the DP-Master of the control system, system switching is executed, and the DP-Master of the standby system serves as the DP-Master of the new control system to continue DP-Slave (C) control and I/O data exchanges.



Setting method

Set the same parameters to the following items in both systems.

Item		Description	Reference
Required	FDL address of the DP-Master of the control system	Set the FDL address when the RJ71PB91V is used as the DP-Master of the control system in "FDL address" of the "Master settings" window of PROFIBUS Configuration Tool.	☞ Page 106 Master Settings
	FDL address of the DP-Master of the standby system	Set the FDL address when the RJ71PB91V is used as the DP-Master of the standby system in "Standby System Master FDL Address" in the "Module Parameter" window of the engineering tool.	☞ Page 61 Module parameter
As needed	DP-Slaves for system switching	Set the system switching condition and specify the target DP-Slaves in the system switching condition setting area of the buffer memory. Ignore this setting when system switching due to DP-Slave errors are not executed.	☞ Page 239 System switching condition setting
	Tracking transfer setting	Set devices to be transferred in "Tracking Setting" of the "CPU Parameter" window of the engineering tool.	🕮 MELSEC iQ-R CPU Module User's Manual (Application)

Point

Because the output data of the send range are inherited by the DP-Master of the standby system through tracking transfer, the output data of the DP-Master of the control system do not have to be set to the DP-Master of the standby system.

However, when refresh setting is disabled, the output data transmitted through tracking transfer must be written to 'Output data area (for mode 3)' (Un\G14336 to Un\G18431) using the program within one scan after system switching. (☞ Page 110 CPU Device Access)

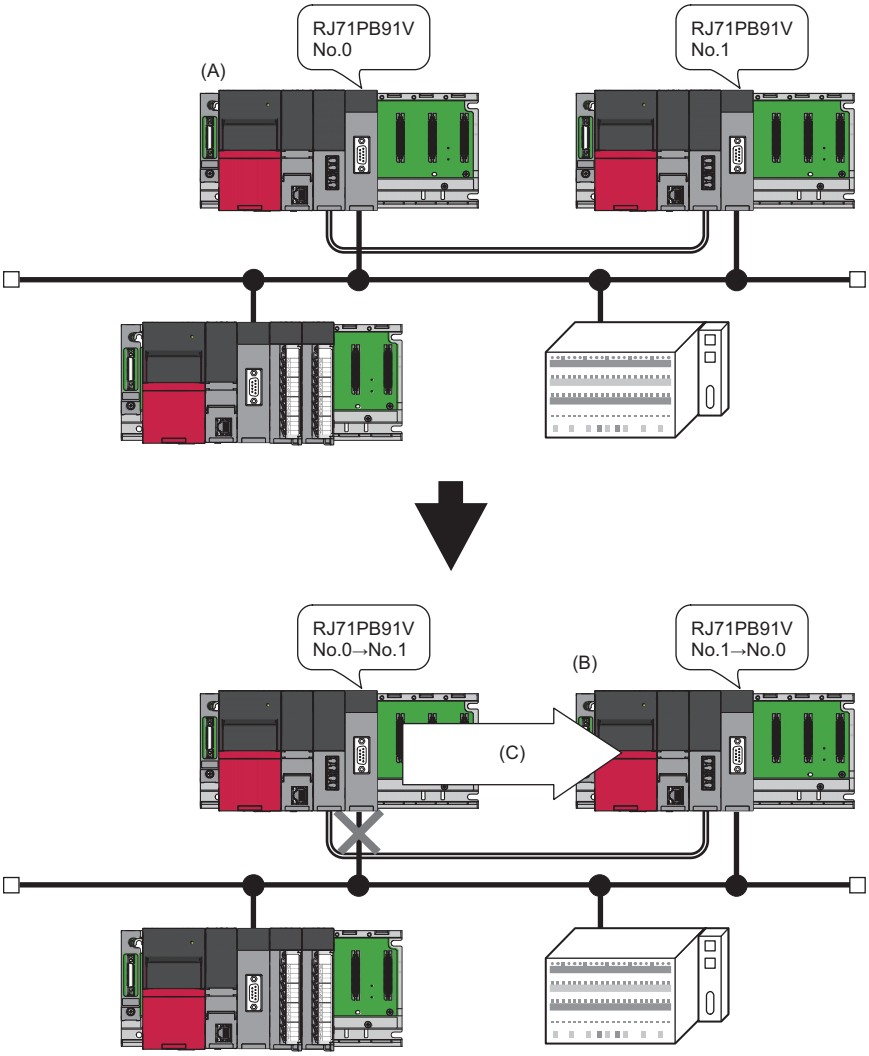
System switching operation

In the redundant system, the control system and the standby system are switched when an error occurs in the control system. In PROFIBUS-DP network, I/O data exchanges continue with send data being inherited by the new control system after system switching.

The system switching (C) is executed when the system switching cause occurs in the control system. (☞ Page 54 System switching request to the CPU module of the control system)

The DP-Master of the control system (A) stops operation, and the DP-Master of the standby system (B) inherits operation as the DP-Master of the new control system and continues control.

When system switching is executed, the FDL addresses of the DP-Masters of both systems change as follows. The changed FDL addresses can be checked in 'Local FDL address display area (Un\G2257)' of the DP-Masters.



Precautions

This section describes precautions for the redundant system using the RJ71PB91V.

DP-Master

■When the system is started

Check the following items. If an error occurs, eliminate the error cause. When an error exists, system switching is not executed. (Except when system switching is caused by a power supply failure.)

- Is there an error in 'Local FDL address error information area' (Un\G23071)?
- Is the ERR LED on the RJ71PB91V in both systems off?

■Continuing each function after system switching

The operations continuing after system switching differs for each function. Check the following.

☞ Page 56 Restricted functions in the redundant system

■Turning off the power or resetting the CPU module in the new control system

If one of the following items is performed before system switching has been completed, output of the DP-Slaves may be turned off for a moment.

- Turning off the power of the new control system
- Resetting the CPU module of the new control system

When performing one of the above items, ensure that system switching has been completed using the following input signal.

- 'Communication READY signal' (X1B) and 'Module ready signal' (X1D) turn on.

■Operation mode enabled in the RJ71PB91V of the standby system

The operation mode can be changed when the CPU module is in the separate mode. (☞ Page 45 Operation Mode Changing Function)

■Automatic generation option for a program to turn on 'Data exchange start request signal' (Y0)

A program that is automatically generated is not compatible with the redundant system. Create a program to start I/O data communications referring to the program example of the redundant system. (☞ Page 162 Program Example of Redundant System)

DP-Slave

■Communication watchdog timer value

Set the communication watchdog timer value to satisfy the following calculation formulas. If the calculation formulas are not satisfied, DP-Slaves experience a communication timeout error while system switching is being executed.

System configuration	Calculation formula	Reference
Only DP-Slaves that do not support a redundant PROFIBUS-DP line*1 (such as the RJ71PB91V and QJ71PB93D) are used.	Communication watchdog timer value ≥ (bus cycle time × 2) + redundant system switching time	• Bus cycle time: ☞ Page 272 Bus cycle time • Redundant system switching time: ☞ Page 276 System switching time
DP-Slaves supporting a redundant PROFIBUS-DP line*1 and those not supporting a redundant PROFIBUS-DP line*1 are mixed.		
Only DP-Slaves that support a redundant PROFIBUS-DP line*1 are used.	Communication watchdog timer value ≥ switch time of the DP-Slave PROFIBUS lines	Switch time of the DP-Slave PROFIBUS lines: 📖 Manual for the DP-Slave
Multi-master system (connects an additional DP-Master to the same network as the DP-Masters of both systems used for the redundant system)	Communication watchdog timer value≥HSA×MSI	• Multi-master system 📖 MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup) • HSA: Maximum FDL address of DP-Slaves in the line (☞ Page 108 Bus Parameter Settings) • MSI (Min. slave interval): Minimum required time for polling cycle (☞ Page 108 Bus Parameter Settings)

*1 Refer to the manual for the DP-Slave to check whether DP-Slaves support a redundant PROFIBUS-DP line.

■Output of DP-Slaves when the CPU modules in both systems are stopped

I/O data exchanges stop when a stop error occurs both in the CPU modules of the DP-Masters of the control system and the standby system. Because of the stop of I/O data exchanges, a communication timeout error occurs in the DP-Slaves to which the communication watchdog timer is set, and output may be turned off.

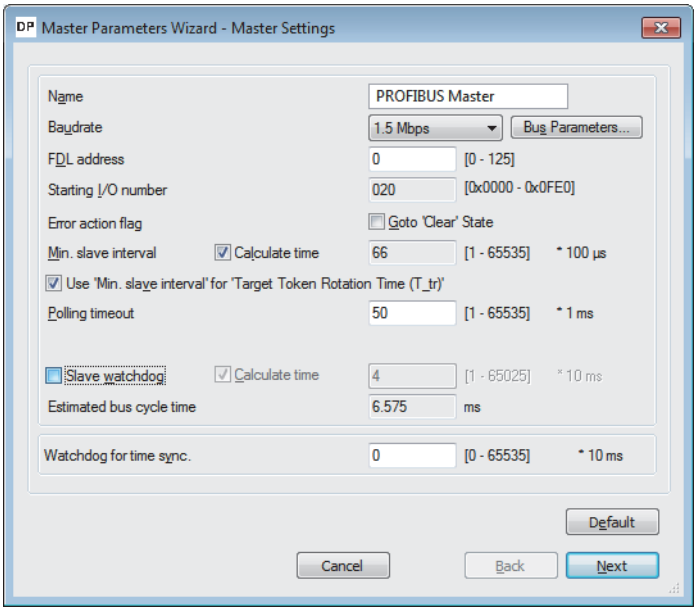
Take the following measure to hold output data of the DP-Slaves when the CPU modules of both systems has stopped.

- DP-Slaves used do not have the output setting function for CPU stop error: Disable the communication watchdog timer of the DP-Slaves using the DP-Master. The watchdog timer of all DP-Slaves are simultaneously disabled, and output data is held.

Ex.

Uncheck the checkbox of "Slave watchdog" in the settings below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ [Master Settings]



- DP-Slaves used have the output setting function for CPU stop error: Set the DP-Slaves to hold the output data. Output data is held while the communication watchdog timer of the DP-Slaves is enabled.

Ex.

When the RJ71PB91V is set as the DP-Slave, refer to the following.

☞ Page 43 Settings for DP-Slaves

Point

Output data may be output from the DP-Slaves to an external device after I/O data exchanges are stopped depending on the settings of the DP-Slaves. (📖 Manual for the DP-Slave)

System switching request to the CPU module of the control system

The following table lists causes of system switching.

Cause	Reference
System switching request from the RJ71PB91V to the CPU module of the control system	• ☞ Page 54 System switching due to DP-Master errors • ☞ Page 60 System switching due to DP-Slave errors
System switching request from a network module other than the RJ71PB91V	🕮 MELSEC iQ-R CPU Module User's Manual (Application)
Error in the control system	
System switching operation from the engineering tool	
System switching instruction from the program	

However, system switching may not be executed depending on the operating status of the standby system.
For operating status of the standby system and execution of system switching, refer to the following.
🕮 MELSEC iQ-R CPU Module User's Manual (Application)

System switching due to DP-Master errors

When any of the following errors occurs in the RJ71PB91V operating as the DP-Master, system switching request is issued to the CPU module.

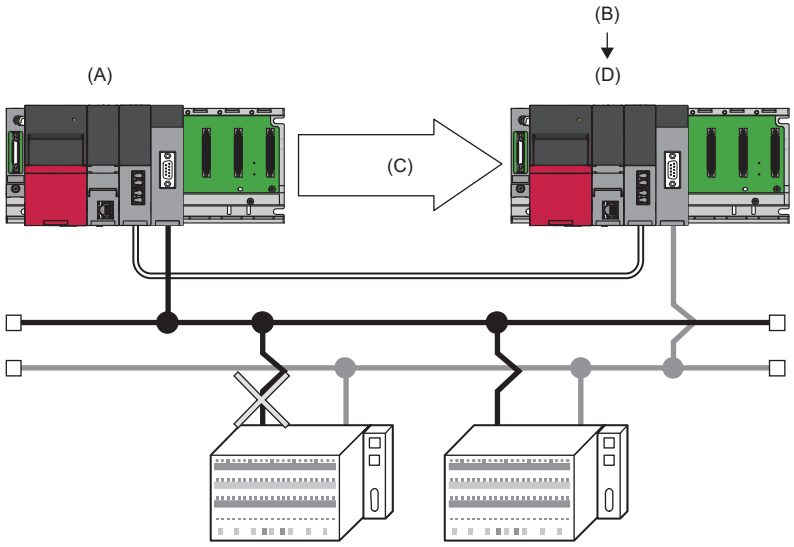
Error code	Description
1801H	No DP-Slaves that exchange I/O data are set to parameters.
1811H	Hardware failure
3E0FH	Hardware failure (system switching is not executed when the power is turned off and on and during the separate mode).
3E1FH	Hardware failure
3E42H	
3E61H	
3EA4H	An error occurred while system switching was being executed (from the DP-Master of the standby system to the DP-Master of the new control system).
3C00H	Hardware failure

System switching due to DP-Slave errors

When detecting a communication error with the DP-Slaves, the RJ71PB91V issues system switching request to the CPU module.

Connect the DP-Slaves that support a redundant PROFIBUS-DP line both to the DP-Masters of the control system (A) and the standby system (B). (📖 Manual for the DP-Slave)

When the DP-Master of the control system detects a communication error with the DP-Slaves, system switching (C) is executed from the standby system to the new control system (D), and control and I/O data exchanges of the DP-Slaves continue.



The RJ71PB91V used as the DP-Slave does not support the system switching due to DP-Slave errors. Use the DP-Slaves that supports the system switching due to DP-Slave errors. (📖 Manual for the DP-Slave)

■Setting method

Specify DP-Slaves where communication errors are to be detected as DP-Slaves for system switching. (☞ Page 239 System switching condition setting)

Point

- When a DP-Slave where a communication error is detected remains abnormal after system switching, system switching is not executed even if another communication error with another DP-Slave occurs. To execute system switching, normalize all communications with DP-Slaves for system switching. DP-Slave status can be checked in 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) of the DP-Master.
- Do not change b8 of 'Diagnostic information invalid setting area' (Un\G2080) of the DP-Master from the initial value. If the initial value is changed, system switching is not executed.
- System switching is executed when a value of 'Current diagnostic information non-notification time area' (Un\G2085) of the DP-Master is turned to 0 after 'Data exchange start request signal' (Y0) is turned on.

Restricted functions in the redundant system

This section describes whether each function and operation of the RJ71PB91V can be continued or automatically re-executed after system switching.

This section also describes setting details, restrictions, and precautions for continuing or re-executing each function.

- ◎: The function can be continued after system switching.
- ○: The function cannot be continued but can be automatically re-executed in the DP-Master of the new control system.
- ×: The function cannot be continued.
- —: The function cannot be set.

I/O data exchange function

Item	Description
Can be continued or re-executed after system switching	◎ (During the backup mode)
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to turn on 'Data exchange start request signal' (Y0) • A device to set 'Output data area (for mode 3)' (Un\G14336 to Un\G18431) (only a device for set output data. Tracking transfer setting to all areas is not required.) When the refresh setting is disabled: 'ON for only one scan after system switching on the new control system (standby system to control system)' (SM1643) turns on after system switching. Output data transmitted through tracking transfer is written to 'Output data area (for mode 3)' (Un\G14336 to Un\G18431) at the timing.
Restrictions	When system switching is executed during I/O data exchanges, input data cannot be received from the DP-Slaves between when the DP-Master of the control system starts system switching and when the DP-Master of the new control system starts operation.
Precautions	This function cannot be executed by the DP-Master of the standby system.

Acquisition of diagnostic information

Item	Description
Can be continued or re-executed after system switching	◎ (During the backup mode)
Setting details required for continuing or re-executing the function	Tracking transfer setting is not required. After turning on of 'Data exchange start request signal' (Y0) is detected, the DP-Master of the new control system acquires all diagnostic information generated in each DP-Slave.
Restrictions	When communication failure occurring in a DP-Slave is cleared during system switching, the system switching continues and the diagnostic information generated cannot be acquired by the DP-Master of the both systems.
Precautions	Diagnostic information cannot be acquired when a value of 'Current diagnostic information non-notification time area' (Un\G2085) is larger than 0 (including when tracking transfer setting is executed in the area). Diagnostic information cannot be acquired in such condition so that communication failure will not be detected during diagnostic information non-notification time. To acquire diagnostic information immediately after the DP-Master of the new control system starts I/O data exchanges, store 0 in 'Diagnostic information non-notification time setting area' (Un\G2084) before turning on 'Data exchange start request signal' (Y0).

Acquisition of extended diagnostic information

Item	Description
Can be continued or re-executed after system switching	× Because this function is executed only once when extended diagnostic information is read, the processing status cannot be transmitted to the DP-Master of the new control system through tracking transfer.
Restrictions	When extended diagnostic information generated in a DP-Slave is cleared during system switching, the information cannot be acquired.

Diagnostic information detection reset

Item	Description
Can be continued or re-executed after system switching	◎ (During the backup mode)
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to turn on 'Diagnostic information detection reset request signal' (Y1)
Precautions	This function cannot be executed by the DP-Master of the standby system.

Diagnostic information area clear

Item	Description
Can be continued or re-executed after system switching	◎ (During the backup mode)
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to turn on 'Diagnostic information area clear request signal' (Y2).
Precautions	This function cannot be executed by the DP-Master of the standby system.

Global control function

Item	Description
Can be continued or re-executed after system switching	○ (During the backup mode) Because this function is executed only once when a service is sent, the processing status cannot be transmitted to the DP-Master of the new control system through tracking transfer.
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to turn on 'Global control request signal' (Y4) • A device to set 'Global control area' (Un\G2081)
Precautions	This function cannot be executed by the DP-Master of the standby system.

Acyclic communication function (Class 1 service)

Item	Description
Can be continued or re-executed after system switching	○ (During the backup mode) Because this function is executed only once when request instruction is received, the processing status cannot be transmitted to the DP-Master of the new control system through tracking transfer.
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to turn on the relevant bit of 'Acyclic communication request execution instruction area' (Un\G23808) • A device to set 'Acyclic communication request area' (Un\G23809 to Un\G24832)
Precautions	• The acyclic communication function cannot be continued when the system switching is executed. If the redundant system is used, note the precautions in this section and ensure that the operation is verified before use. • Communications with DP-Slaves may be initialized due to communication errors caused by a problematic cable, noise, or system switching. When communications with DP-Slaves are initialized during system switching, output of the DP-Slaves is turned off for a moment. Ensure that the systems will have no problems in such situation. • This function cannot be executed by the DP-Master of the standby system.

Acyclic communication function (Class 2 service)

Item	Description
Can be continued or re-executed after system switching	× Data of an INITIATE (Class 2) service is stored in the internal memory of the DP-Master of the control system and cannot be transmitted through tracking transfer. When system switching is executed, execute an INITIATE (Class 2) service again by the DP-Master of the new control system and then another Class 2 service.
Precautions	• The acyclic communication function cannot be continued or re-executed when the system switching is executed. If the redundant system is used, note the precautions in this section and ensure that the operation is verified before use. • When an INITIATE (Class 2) service cannot be executed by the DP-Master of the new control system after system switching, try again later. The service cannot be retried until the DP-Slaves are disconnected from the DP-Master of the control system (timeout) when system switching is executed before DP-Slaves are disconnected with an ABORT (Class 2) service. The timeout time is the one set to the transmission time in the request format for INITIATE (Class2) service of the DP-Master of the new standby system.

Alarm acquisition function

Item	Description
Can be continued or re-executed after system switching	× Alarm occurrence information in DP-Slaves is stored in the internal memory of the DP-Master of the control system and cannot be transmitted through tracking transfer. Alarm occurrence information thus cannot be inherited by the DP-Master of the new control system.
Restrictions	An alarm cannot be cleared when system switching is executed while an alarm exists in a DP-Slave. An alarm cannot be acquired in such condition because the DP-Master of the new control system cannot inherit alarm occurrence information received by the DP-Master of the control system and thus cannot acquire an alarm again from the DP-Slave. When a DP-Master is executed two system switchings from the control system to the standby system and again to the control system, the DP-Master cannot acquire an alarm from a DP-Slave based on the alarm occurrence information it received before the first system switching.
Precautions	The alarm acquisition function cannot be continued or re-executed when the system switching is executed. If the redundant system is used, note the precautions in this section and ensure that the operation is verified before use.

Time control over DP-Slaves

Item	Description
Can be continued or re-executed after system switching	○ (During the backup mode) Because this function is executed only once when a request is received, the processing status cannot be transmitted to the DP-Master of the new control system through tracking transfer.
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to turn on 'Time control start request signal' (Y19). • A device to set 'Time control setting request area' (Un\G26784 to Un\G26792).
Precautions	This function cannot be executed by the DP-Master of the standby system.

Data swap function

Item	Description
Can be continued or re-executed after system switching	◎
Setting details required for continuing or re-executing the function	Tracking transfer setting is not required.

Data consistency function

Item	Description
Can be continued or re-executed after system switching	◎ (During the backup mode)
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device for output data transmission specified in the refresh setting
Restrictions	When system switching is executed during I/O data exchanges, input data cannot be received from the DP-Slaves between when the DP-Master of the control system starts system switching and when the DP-Master of the new control system starts operation.

Output setting function for CPU stop error

Item	Description
Can be continued or re-executed after system switching	— I/O data exchanges with the DP-Slaves continues until both systems go down regardless of the settings.
Restrictions	Output data is held regardless of the value set in "CPU Error Output Mode Setting". Because this function cannot be executed when system switching fails.
Precautions	When communications stop because of system switching failure, the output status of the DP-Slaves differs depending on the setting. (☞ Page 53 Output of DP-Slaves when the CPU modules in both systems are stopped)

Temporarily reserved station specification function

Item	Description
Can be continued or re-executed after system switching	○ (During the backup mode) Because this function is executed only once when a request is received, the processing status cannot be transmitted to the DP-Master of the new control system through tracking transfer.
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to set 'Temporarily reserved station specification request area' (Un\G23608 to Un\G23615) 'ON for only one scan after system switching on the new control system (standby system to control system)' (SM1643) turns on after system switching. Before turning on 'Data exchange start request signal' (Y0), re-execute the temporarily reserved station specification function at the timing.
Precautions	This function cannot be executed by the DP-Master of the standby system.

Operation mode changing function

Item	Description
Can be continued or re-executed after system switching	× Consistency of the operation modes of the DP-Masters of both systems cannot be guaranteed.
Restrictions	Change the operation mode after setting the CPU module to the separate mode. If the operation modes of the DP-Masters of both systems differ, the operation of the DP-Master of the new control system cannot be guaranteed. Example: When the CPU module writes parameters in the backup mode, the DP-Masters of both systems go into the communication mode (mode 3). When the DP-Master of the control system (mode1/2/9/F/A) is changed to the offline operation mode in this state, I/O data exchanges are stopped. However, if system switching is executed, I/O data exchanges are started because the DP-Master of the new control system is in the communication mode (mode 3).
Precautions	When setting the CPU module back to the backup mode after changing the operation mode, ensure that the DP-Masters of both systems are in the same operation mode.
	Stop tracking transfer before changing the operation mode. (📖 MELSEC iQ-R CPU Module User's Manual (Application)) If tracking transfer is not stopped, the operation mode of the DP-Master of the standby system may also be changed simultaneously even if the CPU module is in the separate mode. Example 1: When the program to change the operation mode using 'Operation mode change request signal' (Y11) is running, and a device to turn on 'Operation mode change request signal' (Y11) has been selected for tracking transfer, the operation mode of the DP-Master of the standby system is changed in response to the change in the operation mode of the DP-Master of the control system. Example 2: When a value is stored in 'Operation mode change request area' (Un\G2255) of the DP-Master of the standby system, and 'Operation mode change request signal' (Y11) has been selected for tracking transfer, the mode of the DP-Master of the standby system is changed when 'Operation mode change request signal' (Y11) of the DP-Master of the control system is turned on.
	When changing the operation mode of a DP-Master while the CPU module is in the separate mode, do not execute system switching from the engineering tool or with the SP.CONTSW instruction. Example: When the operation mode of the DP-Master of the standby system is changed to the offline operation mode (mode1/2/9/F/A) while I/O data is exchanging on the DP-Master of the control system, I/O data exchanges cannot be continued on the DP-Master of the new control system after system switching.

System switching due to DP-Slave errors

Item	Description
Can be continued or re-executed after system switching	◎ (During the backup mode)
Setting details required for continuing or re-executing the function	Set the following items in "Tracking Setting". • A device to set 'System switching condition setting' (Un\G23648) • A device to set 'System switching DP-Slave specification' (Un\G23649 to Un\G23656)
Restrictions	• The DP-Master of the new control system executes system switching due to DP-Slave errors after checking normal communications with all DP-Slaves set in system switching condition setting area of the buffer memory. Confirming normal communications with the DP-Slaves is required to prevent the DP-Master of the new control system from detecting DP-Slave errors immediately after system switching and executing system switching consecutively. • System switching due to DP-Slave errors is executed from the point where a value of 'Current diagnostic information non-notification time area' (Un\G2085) of the DP-Master is turned to 0 after 'Data exchange start request signal' (Y0) is turned on. This execution timing is set to prevent the detection of diagnostic information during diagnostic information non-notification time.
Precautions	This function cannot be executed by the DP-Master of the standby system.

2 PARAMETER SETTINGS

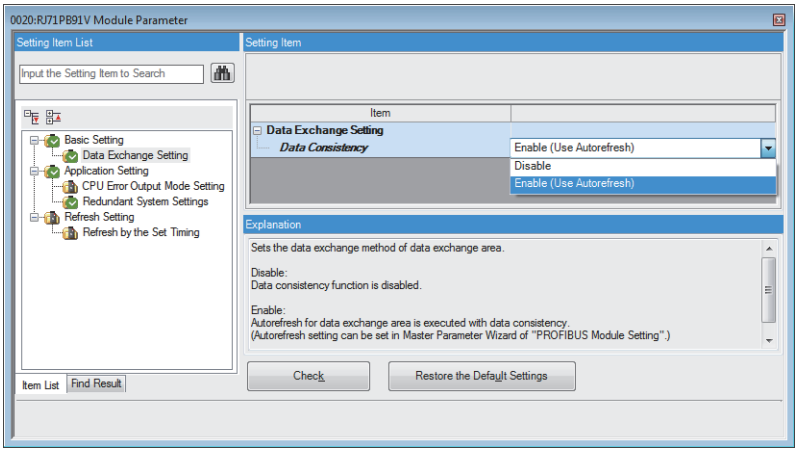
This chapter describes parameter settings necessary for the RJ71PB91V.

2.1 Parameter Settings on DP-Master

This section describes configuration of parameter settings when the RJ71PB91V is used as DP-Master.

Module parameter

This section describes the "Module Parameter" window of the engineering tool.



Name	Item	Description	Setting
Basic Setting	Data Consistency*1	Sets whether to enable/disable the data consistency function when using the refresh settings. (☞ Page 39 Data Consistency Function) • Disable: Disables the data consistency function. • Enable (Use Autorefresh): Enables the data consistency function. Configure the refresh settings of "Master Settings" under "Setup Tasks" in the "PROFIBUS Configurator Tasks" window. (☞ Page 77 Setup Tasks)	• Disable • Enable (Use Autorefresh) (Default: Disable)
Application Setting	CPU Error Output Mode Setting	Sets the RJ71PB91V status when a CPU module stop error occurs. (☞ Page 41 Output Setting Function for CPU Stop Error) ■Clear • I/O data exchanges with DP-Slaves are interrupted. • The output data in the buffer memory of the RJ71PB91V are cleared and not sent. • When the CPU module stop error occurs, the input data received from DP-Slaves are held in the buffer memory of the RJ71PB91V. ■Hold • I/O data exchanges with DP-Slaves are continued. • The output data in the buffer memory of the RJ71PB91V are held when the CPU module stop error occurs and then sends the data to the DP-Slaves. • The input data received from DP-Slaves are updated into the buffer memory of the RJ71PB91V.	• Clear • Hold (Default: Clear)
	Redundant System Settings	Enables/disables of the redundant system.	• Disable • Enable (Default: Disable)
	Standby System Master FDL Address	Sets the FDL address when the RJ71PB91V is set as the DP-Master of the standby system.	0 to 125 (Default: 1)
Refresh Setting	Refresh Timing	Sets the refresh timing.	• At the Execution Time of END Instruction • At the Execution Time of Specified Program (Default: At the Execution Time of END Instruction)
	Refresh Group	Specifies the refresh group of the program. Set the refresh group of the program on "Program Setting" in "CPU Parameter".	1 to 64 (Default: 1)

*1 When "Use Autorefresh" is disabled for "CPU Device Access" in "PROFIBUS Module Setting", the data consistency function cannot be used. Therefore, when "Use Autorefresh" is disabled, the data consistency function is automatically disabled.
In addition, when "Use Autorefresh" is enabled, the data consistency function is automatically enabled.
(The status is changed when "CPU Device Access" in "PROFIBUS Module Setting" is completed, or when the PROFIBUS labels are updated. When the module parameter window of the RJ71PB91V remains open, the parameters are reflected once the module parameter window is closed and opened.)
For details on the setting procedure, refer to the following.
☞ Page 110 CPU Device Access

PROFIBUS Module Setting

Start PROFIBUS Configuration Tool and configure the PROFIBUS module settings. (☞ Page 70 PROFIBUS Configuration Tool)

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting]

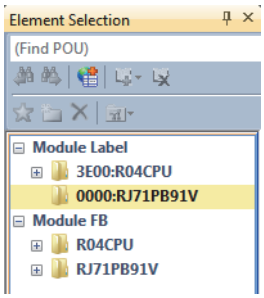
Update of PROFIBUS Labels

This function creates and updates the structures used for global labels and module function blocks by enabling the refresh settings. (☞ Page 86 Update PROFIBUS Label)

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Settings] ⇨ [PROFIBUS Configurator Tasks] ⇨ [Setup Tasks] ⇨ [Update PROFIBUS Label]

Point

A module label cannot be used for this product. Although module labels are displayed in the Element Selection window in the engineering tool as shown below, the module labels cannot be created by clicking "Add Module Label".



Stopping online function and diagnostics function

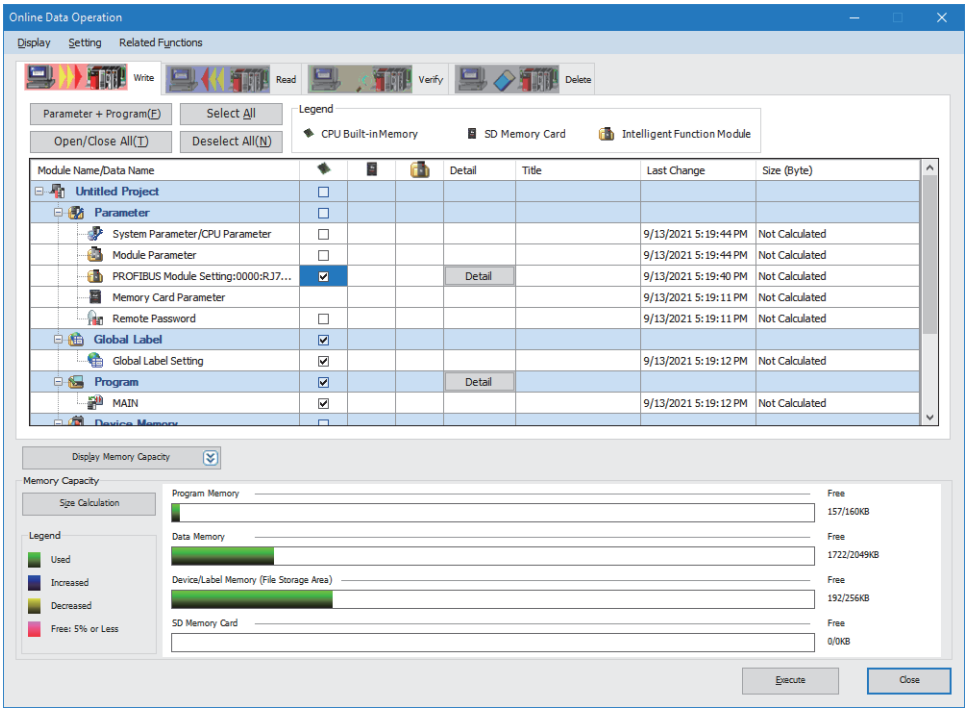
Stop monitoring before writing parameters when the following processing is executed using the engineering tool.

- Functions (such as [Device/Buffer Memory Batch Monitor]) under [Monitor] of the [Online] menu
- Functions (such as monitor of [Module Diagnostics (CPU Diagnostics)]) under the [Diagnostics] menu

Writing parameters

Check the boxes in the "Module Parameter and "PROFIBUS Module Setting" on the "Online Data Operation" window of the engineering tool before writing.

[Online] ⇨ [Write to PLC]



The parameters have different write destinations.

Checked item	Written parameters	Write destination
Module Parameter	Refresh Setting	CPU module
PROFIBUS Module Setting*1	PROFIBUS communications parameters*2	CPU module or the SD memory card of the CPU module The SD memory card is prioritized if the parameters are written to both the CPU module and the SD memory card.

*1 If the box in the "PROFIBUS Module Setting" is checked, global labels and all programs are automatically checked as write targets.

*2 When the version of the engineering tool is Ver1.095Z or later and the version of PROFIBUS Configuration Tool is Ver1.07H or later, simultaneous writing of a PROFIBUS Configuration Tool project and PROFIBUS communication parameters becomes possible. For details on the setting method, refer to the following.

☞ Page 64 PROFIBUS module setting

For the writing parameters to the CPU module or the SD memory card of the CPU module, refer to the following.

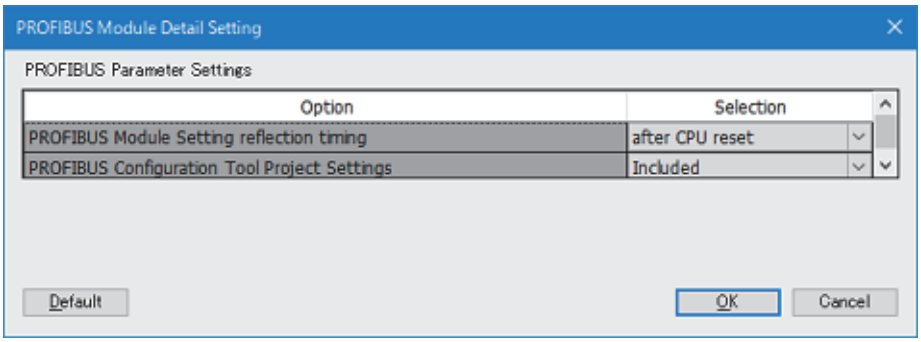
GX Works3 Operating Manual

Precautions

When the version of the engineering tool is earlier than Ver1.095Z and the version of PROFIBUS Configuration Tool is earlier than Ver1.07H, writing and reading of a PROFIBUS Configuration Tool project using the engineering tool is not possible.

PROFIBUS module setting

By clicking the [Detail] button of the "PROFIBUS Module Setting", the following window appears.



Item	Description	Setting
PROFIBUS Module Setting reflection timing	Select the timing to enable the written PROFIBUS communication parameters. "after CPU reset": The PROFIBUS module settings are reflected after resetting the CPU module. "after writing to CPU": The PROFIBUS module settings are reflected after writing parameters to the CPU module. (Resetting the CPU module is not required.)	• after CPU reset*1 • after writing to CPU (Default: after CPU reset)
PROFIBUS Configuration Tool Project Settings	A file for enabling parameters set using PROFIBUS Configuration Tool to be read from the CPU module or SD memory card. Whether or not to include a PROFIBUS Configuration Tool project when writing PROFIBUS module settings (parameters) can be selected. "Included": Include a PROFIBUS Configuration Tool project when writing parameters. (PROFIBUS module settings can be read.) "Excluded"*2: Do not include a PROFIBUS Configuration Tool project when writing parameters. (Select this option when there is not much free space in the memory of the CPU module.)	• Included • Excluded (Default: Included)

*1 If writing is performed while the RJ71PB91V is communicating, the communications are temporary stopped. In this case, the communications are automatically restarted after the PROFIBUS module settings are reflected.

*2 When the version of the engineering tool is Ver1.090U or later and the version of PROFIBUS Configuration Tool is earlier than Ver1.06G, this item is fixed to "Excluded".

Restriction

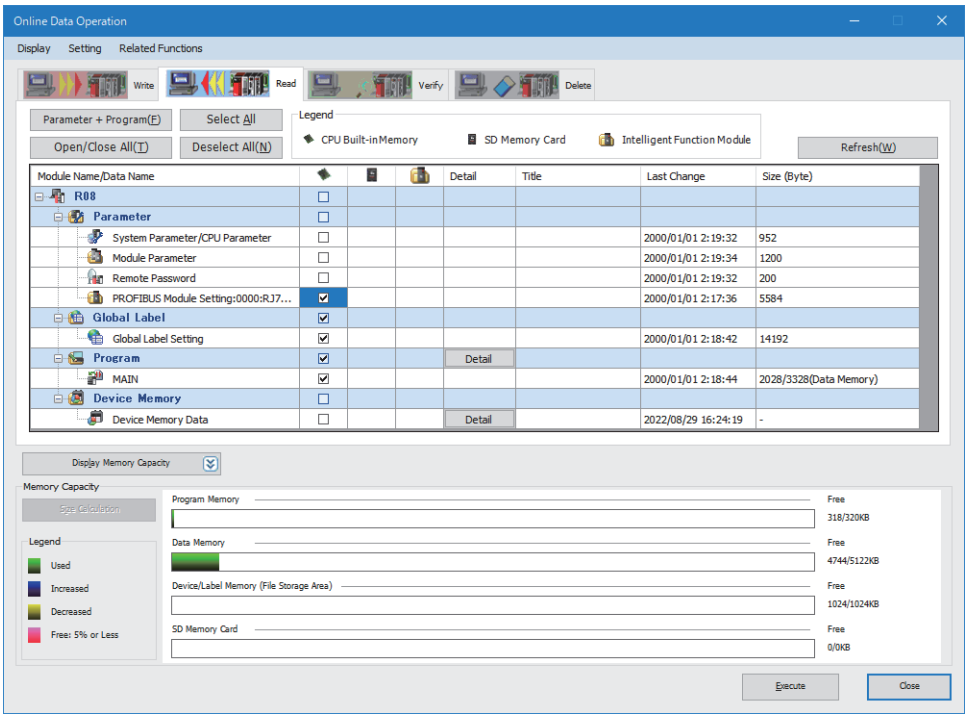
Check the firmware version of the RJ71PB91V and software version of the engineering tool. (☞ Page 291 Added and Enhanced Functions)

The PROFIBUS module settings are not reflected after writing parameters to the CPU module in the following cases. Select "after CPU reset", then, reset the CPU module or power off and on the system after writing parameters.

- Normal operation mode (mode 0)
- Parameter setting mode (mode 1)
- Self-diagnostic mode (mode 2)
- Flash ROM clear mode (mode 9 → mode F → mode A)
- Operating in the redundant system
- Executing the acquisition of extended diagnostic information
- Executing the global control function
- Executing the acyclic communication function
- Executing the alarm acquisition function
- Executing the time control over DP-Slaves
- Executing the operation mode changing function
- When "Use Autorefresh" is checked in the "CPU Device Access" window (☞ Page 110 CPU Device Access)
- When the PROFIBUS module settings with checked in "Use Autorefresh" in the "CPU Device Access" window has already been written to the CPU module (☞ Page 110 CPU Device Access)

Reading parameters

When a PROFIBUS Configuration Tool project is included in the data to be read, and "PROFIBUS Module Setting" is checked, the PROFIBUS Configuration Tool project can be read.



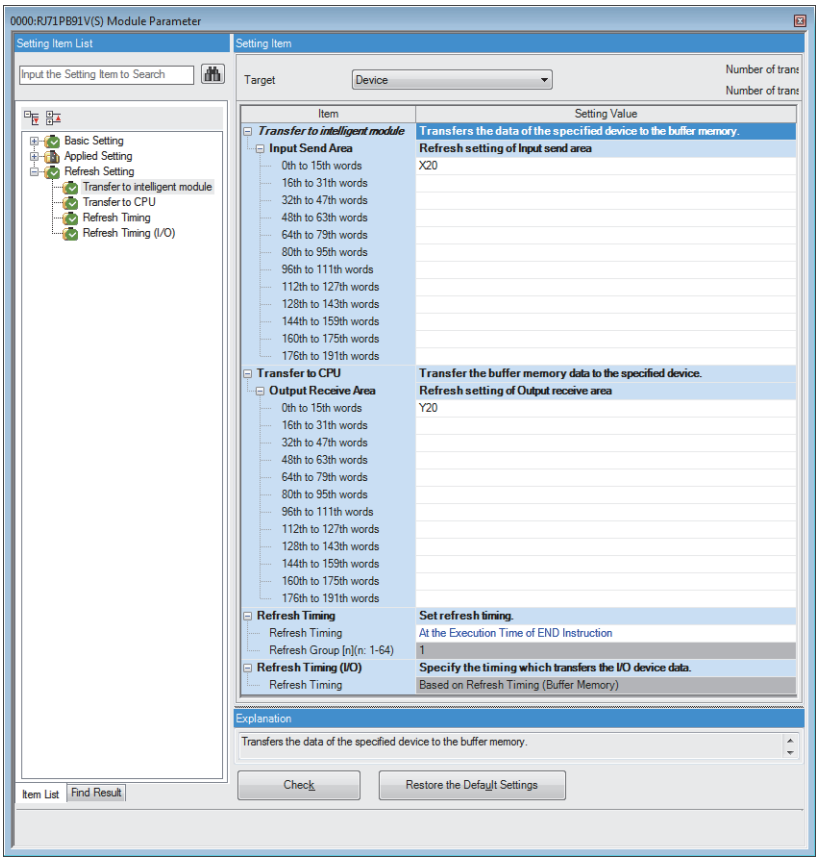
Point

- "Upload Configuration Image" and "Download Configuration Image" in "Online Tasks" of PROFIBUS Configuration Tool do not support writing or reading PROFIBUS Configuration Tool projects.
- PROFIBUS module settings are associated with labels and programs. To assure data consistency, when reading parameters, read PROFIBUS Configuration Tool projects, labels, and programs together.
- PROFIBUS Configuration Tool projects created with the engineering tool version Ver1.090U or later and PROFIBUS Configuration Tool version Ver1.06G or later may not be deleted with older versions of the engineering tool and PROFIBUS Configuration Tool.

2.2 Parameter Settings on DP-Slave

Module parameter

This section describes the "Module Parameter" window of the engineering tool.



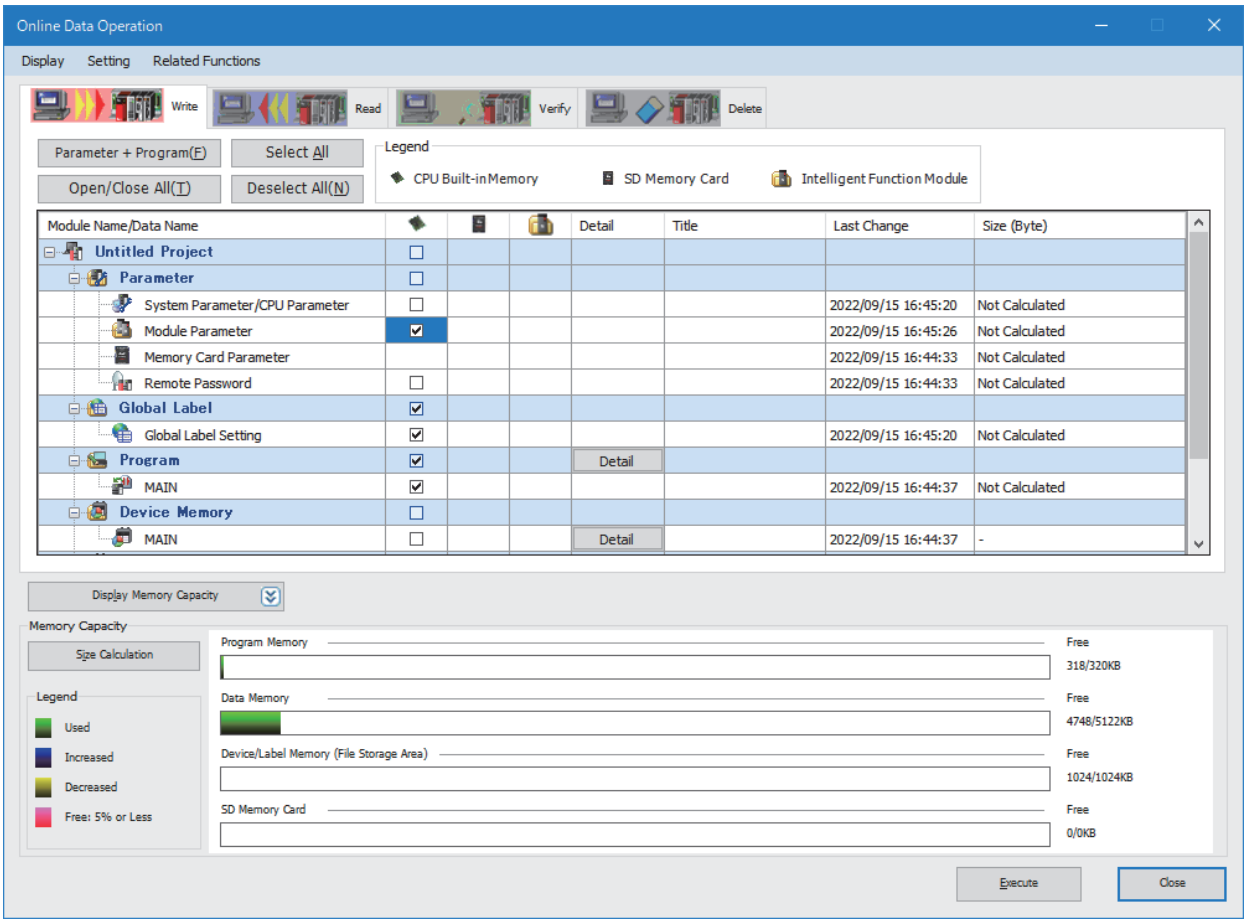
Name	Item	Description	Setting
Basic Setting	Setting Method Of FDL Address	Selects the method for setting the FDL address of DP-Slave. (☞ Page 48 FDL address changing function) ■When "Parameter Editor" is selected • "FDL Address" displayed in this window is used. • The FDL address cannot be changed from the DP-Master. • The FDL address can be changed from a program after startup. • The FDL address saved to the flash ROM cannot be changed from the DP-Master or a program. ■When "Information Saved In Module" is selected • The FDL address saved to the flash ROM is used. • The FDL address can be changed from the DP-Master or a program after startup. • The FDL address saved to the flash ROM can be changed from the DP-Master or a program.	• Parameter Editor • Information Saved In Module (Default: Parameter Editor)
	FDL Address	Sets the FDL address of a DP-Slave. This item can be used only when "Setting Method Of FDL Address" is set to "Parameter Editor". When a value out of the setting range or supported range is set, a moderate error (parameter error) occurs, and the module stops operation. (☞ Page 170 Checking with LED)	0 to 125 (Default: 1)
	Data Consistency	Sets I/O data exchange method. (☞ Page 39 Data Consistency Function) • Disable: Disables the data consistency function. • Enable: Enables the data consistency function. To enable this item, set the refresh target of "Input Send Area" and "Output Receive Area" using "Refresh Setting" in this window. If the refresh target is not set, 'Input send area' (Un\G256 to Un\G447) and 'Output receive area' (Un\G0 to Un\G191) are not updated.	• Disable • Enable (Default: Disable)

Name	Item	Description	Setting
Applied Setting	CPU Error Output Mode Setting	Sets the status of DP-Slave when a CPU module stop error occurs. (☞ Page 41 Output Setting Function for CPU Stop Error) ■Clear • The input data sent from the DP-Slave to the DP-Master is cleared. • The output data received from the DP-Master at the occurrence of the CPU module stop error is held in the buffer memory on the DP-Slave. ■Hold • For the input data sent from the DP-Slave to the DP-Master, the value at the occurrence of the CPU module stop error is held. • The output data received from the DP-Master at the occurrence of the CPU module stop error is held in the buffer memory on the DP-Slave.	• Clear • Hold (Default: Clear)
Refresh Setting	Target	Sets the device or module label of the CPU module that exchanges data with the buffer memory on the DP-Slave. The display and options for "Input Send Area" and "Output Receive Area" are changed according to this setting.	• Module Label • Refresh Data Register (RD) • Device
	Input Send Area • 0 to 15th words • 16th to 31st words • 32nd to 47th words • 48th to 63rd words • 64th to 79th words • 80th to 95th words • 96th to 111th words • 112th to 127th words • 128th to 143rd words • 144th to 159th words • 160th to 175th words • 176th to 191st words	• Transfers data from the device specified in "Input Send Area" to 'Input send area' (Un\G256 to Un\G447) on the DP-Slave. • Transfers data from 'Output receive area' (Un\G0 to Un\G191) on the DP-Slave to the device specified in "Output Receive Area". ■When "Target" is set to "Module Label" Data is transferred between the module label corresponding to each buffer memory and the buffer memory. "Enable" or "Disable" setting selected for "0 to 15th words" in "Input Send Area" is automatically applied to other transfer destinations. ■When "Target" is set to "Refresh Data Register (RD)" Data is transferred between the refresh data register (RD) of the CPU module and the buffer memory. When RD is specified for "Start Device Name", other transfer destinations are specified accordingly. ■When "Target" is set to "Device" Data is transferred between the specified device of the CPU module and the buffer memory. Specify the device in "Input Send Area" and "Output Receive Area". Make sure that the device range does not contain transfer destinations of other buffer memory. X, Y, M, L, B, or RD device can be specified. For other than RD, specify a number that is divisible by 16.	—
	Output Receive Area • 0 to 15th words • 16th to 31st words • 32nd to 47th words • 48th to 63rd words • 64th to 79th words • 80th to 95th words • 96th to 111th words • 112th to 127th words • 128th to 143rd words • 144th to 159th words • 160th to 175th words • 176th to 191st words		
	Refresh Timing	Sets the refresh timing.	• At the Execution Time of END Instruction • At the Execution Time of Specified Program
	Refresh Group	Specifies the refresh group of the program. Set the refresh group of the program on "Program Setting" in "CPU Parameter".	1 to 64 (Default: 1)
	Refresh Timing (I/O)	Specifies the timing for transferring data of I/O device.	Based on Refresh Timing (Buffer Memory) (fixed)

Writing parameters

To write parameters, check the boxes of "Module Parameter" in the "Online Data Operation" window in the engineering tool.

[Online] ⇨ [Write to PLC]



Parameters are written as follows.

Checked item	Written parameters	Write destination
Module parameter	FDL Address Setting, Data Consistency, Refresh Setting	CPU module

For writing of parameters to the CPU module, refer to the following.

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The written parameters are enabled when the CPU module is reset or the system is powered off and on.

Slave parameter settings on DP-Master

- When the RJ71PB91V is used as the DP-Master, slave parameter settings are included in the PROFIBUS module settings in PROFIBUS Configuration Tool. (☞ Page 113 Slave Settings)
- When other module than the RJ71PB91V is used as the DP-Master, set the following items on the DP-Master used. (☞ Manual for the DP-Master used)

Slave parameters

Item names may vary with the configuration tool used.

Item		Description	Setting
Station number (FDL Address)		Sets the FDL address of a DP-Slave to which the slave parameters are distributed.	0 to 125
Communication watchdog timer value (T_wd)		Sets the time of the communication watchdog timer. (Unit: ×10ms) When the DP-Slave fails to receive data from the DP-Master within the specified time period, the DP-Slave detects a communication timeout. ■Precautions Do not set the communication watchdog timer value to 1. Doing so may cause a parameter error and result in a communication timeout error regardless of the communication status.	2 to 65025
Minimum response time (min T_sdr)		Sets the minimum response time for sending the response frame from the DP-Slave to the DP-Master. (Unit: TBit)	1 to 255 (Default: 11)
Group number (Group_Ident)		Sets the group number to which the module belongs. Multiple group numbers can be set.	Grp 1 to Grp 8
I/O configuration information (Cfg_Data)	Sets the configuration of I/O data by combining data modules. (Example: ☞ Page 124 I/O data assignment)		
	Data module type	Selects the type of the data module to be used from 96 combination patterns of the following setting items. • Specified input/output (Input/Output): Input, output, I/O • Data format (Length format): Word • Data size (Length of data): 1 to 16 (Unit: Word) • Data consistency (Consistency over): Word unit (Con word), data module unit (con whole)	
	Number of data modules	Sets the number of data modules. Data module size is as follows. • Total size of data modules of which input/output is set to input or I/O: Maximum 122 words • Total size of data modules of which input/output is set to output or I/O: Maximum 122 words Total size of data modules of which input/output is set to input, output, or I/O: Maximum 192 words	1 to 40
User parameter (Usr_Prm_Data)	Data assignment mode (Data Alignment Mode)	Assign I/O data in 'Output receive area' (Un\G0 to Un\G191) and 'Input send area' (Un\G256 to Un\G447) of the buffer memory on the DP-Slave. • 0: Batch assignment mode (LUMP mode): Stores data in both areas from the start point. • 1: Divided assignment mode (DIVIDED mode): Stores data according to the assignment of the data module.	• 0 • 1 (Default: 0)
	Data swap setting (Word Data Swap)	Sets whether to swap the upper byte and lower byte of exchanged I/O data in units of words when I/O data are sent/received. (☞ Page 37 Data Swap Function) • 0: Disable • 1: Enable	• 0 • 1 (Default: 0)

3 PROFIBUS Configuration Tool

Start PROFIBUS Configuration Tool that is used for configuring settings on the DP-Master using the engineering tool.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting]

To use the RJ71PB91V as a DP-Slave, first load the latest GSD file of the DP-Slave into PROFIBUS Configuration Tool. (☞ Page 79 Add GSD File)

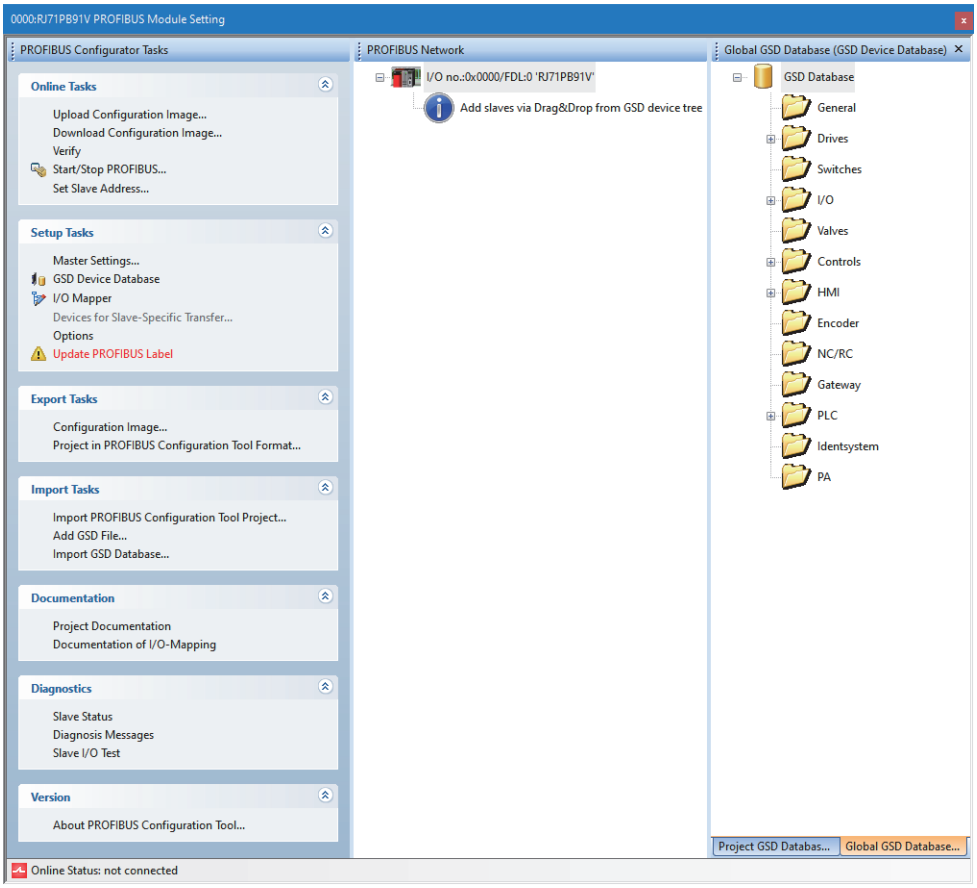
For the latest GSD file of the RJ71PB91V, please consult your local Mitsubishi representative.

3.1 Window Structure

This section describes the overall structure of the window.

The layout of each function window can be customized and saved.

The window below is an example.

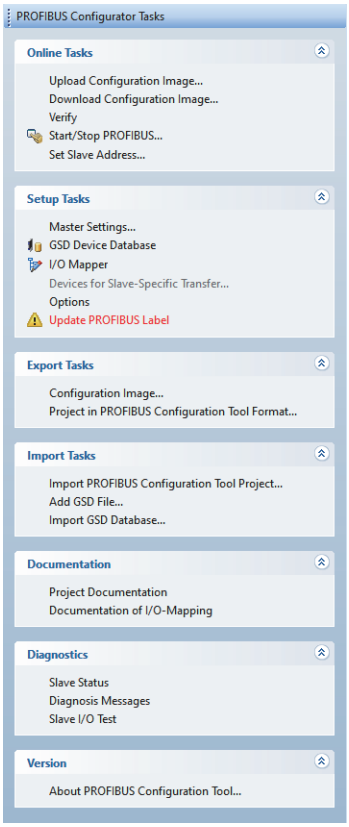


Name of function window	Reference
"PROFIBUS Configurator Tasks" window	Page 71 "PROFIBUS Configurator Tasks" Window
"PROFIBUS Network" window	Page 104 "PROFIBUS Network" Window

3.2 "PROFIBUS Configurator Tasks" Window

The "PROFIBUS Configurator Tasks" window displays the project management functions by group.

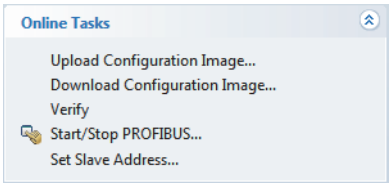
The following figure shows the items in the "PROFIBUS Configurator Tasks" window.



Group name	Reference
Online Tasks	Page 72 Online Tasks
Setup Tasks	Page 77 Setup Tasks
Export Tasks	Page 93 Export Tasks
Import Tasks	Page 95 Import Tasks
Documentation	Page 96 Documentation
Diagnostics	Page 98 Diagnostics
Version	Page 103 Version

Online Tasks

This section describes the items of "Online Tasks".



Menu	Description	Target systems in the redundant system	Reference
Upload Configuration Image	Uploads (reads) setting details from the CPU module or the SD memory card of the CPU module and saves them as a configuration image file.	A system that is set to "Specify Redundant CPU" in the "Specify Connection Destination Connection" window of the engineering tool.	Page 73 Upload Configuration Image
Download Configuration Image	Downloads (writes) setting details from a configuration image file to the CPU module or the SD memory card of the CPU module.	Both systems	Page 74 Download Configuration Image
Verify	Verifies the setting details of a project against the setting details stored in the CPU module or the SD memory card of the CPU module.	A system that is set to "Specify Redundant CPU" in the "Specify Connection Destination Connection" window of the engineering tool.	Page 75 Verify
Start/Stop PROFIBUS	Starts/stops the PROFIBUS-DP Network I/O data exchanges.	Control system	Page 75 Start/Stop PROFIBUS
Set Slave Address	Changes the FDL address of the DP-Slaves with Online.	Control system	Page 76 Set Slave Address

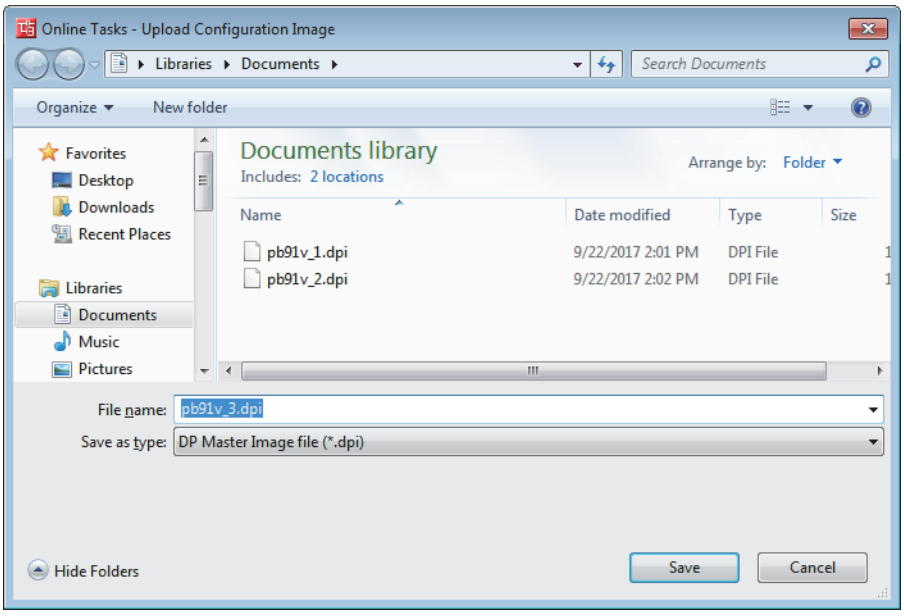
Upload Configuration Image

Uploads (reads) setting details from the CPU module or the SD memory card of the CPU module and saves them as a configuration image file.

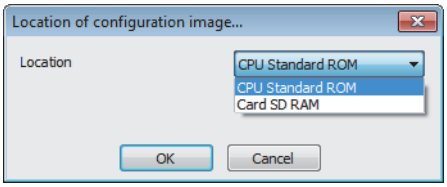
Only the RJ71PB91V projects can be uploaded.

Operating procedure

1. Select "Upload Configuration Image" in "Online Tasks".
2. Select the configuration image file to be uploaded.



3. Select the drive containing the setting details to be uploaded in "Location" of the "Location of configuration image" window.



Item	Description	Setting range
Location	Select the drive containing the setting details to be uploaded. The following items are displayed even when the corresponding setting details do not store in the drive. • CPU Standard ROM: The memory of the CPU module • Card SD RAM: The SD memory card inserted in the CPU module	• CPU Standard ROM • Card SD RAM (Default: CPU Standard ROM)

4. Upon establishing a connection to the CPU module, the current configuration is uploaded from the drive selected in the "Location of configuration image" window and saved as a configuration image file in .dpi format.

For downloading (writing) the configuration image file, refer to the following.

☞ Page 74 Download Configuration Image

Precautions

- The uploaded configuration image file contains master parameters and slave parameters. The refresh settings are not contained.
- The uploaded configuration image file cannot be imported to PROFIBUS Configuration Tool projects. (Master parameters and slave parameters cannot be changed.)

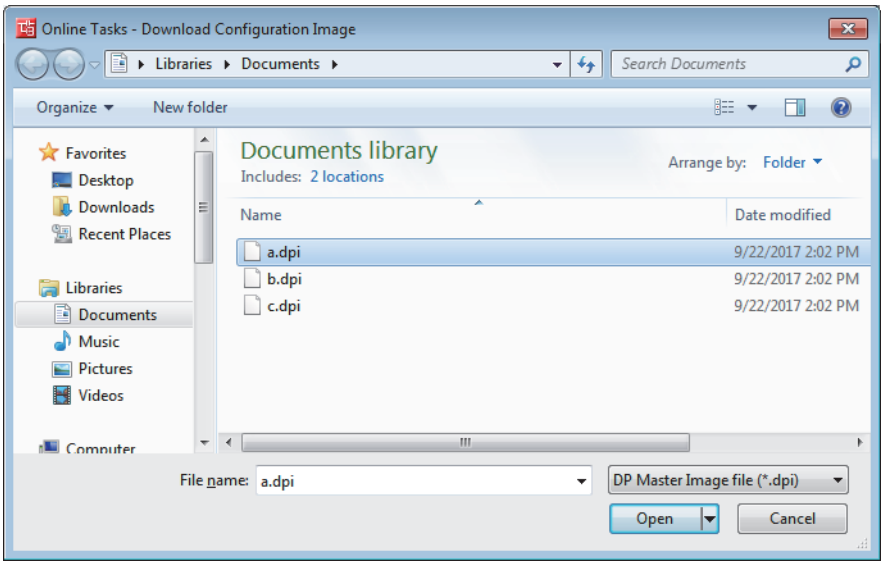
Download Configuration Image

Downloads (writes) setting details from a configuration image file to the CPU module or the SD memory card of the CPU module.

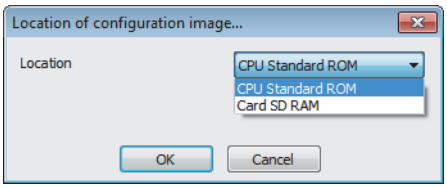
This item is enabled for the RJ71PB91V projects.

Operating procedure

1. Select "Download Configuration Image" in "Online Tasks".
2. Select the configuration image file to be downloaded.



3. Select the drive storing the setting details in "Location" of the "Location of configuration image" window.



Item	Description	Setting range
Location	Select the drive to store the setting details. • CPU Standard ROM: The memory of the CPU module • Card SD RAM: The SD memory card inserted in the CPU module	• CPU Standard ROM • Card SD RAM (Default: CPU Standard ROM)

4. In the redundant system, either of the following window is displayed.
- When both systems can download: A window to check for writing to both systems
- When only either of the system can download (such as unconnected tracking cables): A window to check for writing to the system connected to PROFIBUS Configuration Tool

5. Upon establishing a connection to the CPU module, the current configuration is uploaded from the drive and saved to the configuration image file in binary format.

Precautions

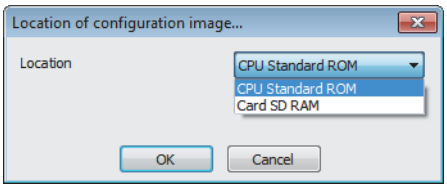
- Configuration image files that are uploaded or exported by PROFIBUS Configuration Tool can be downloaded only.
- The master module type should be the same between the project and the configuration image file. If these master module types are different, the file cannot be downloaded.

Verify

Uploads setting details stored in the CPU module and the SD memory card of the CPU module and verifies them against the current setting details of a project.

Operating procedure

1. Select "Verify" in "Online Tasks".
2. Select the drive containing the setting details to be verified against the setting details of the current project in "Location" of the "Location of configuration image" window.



Item	Description	Setting range
Location	Select the drive containing the setting details to be verified against the setting details of the current project. The following items are displayed even when the corresponding setting details do not store in the drive. • CPU Standard ROM: The memory of the CPU module • Card SD RAM: The SD memory card inserted in the CPU module	• CPU Standard ROM • Card SD RAM (Default: CPU Standard ROM)

3. The results of the verification between the configuration image file stored in the drive selected of the "Location of configuration image" window and the configuration image file created from the current project are displayed.

Precautions

For the refresh settings, the checkbox status of "Slave specific transfer" and "Use Autorefresh" in the "CPU Device Access" window is verified, but the content of device assignment is not verified.

Start/Stop PROFIBUS

This item is used to manually start or stop I/O data exchanges with DP-Slaves.

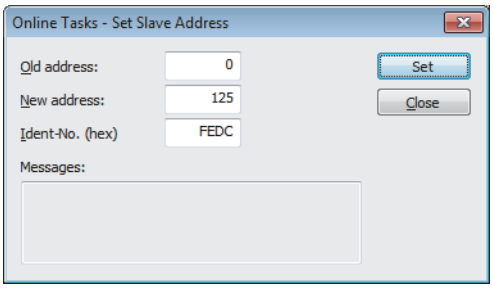
- If the PROFIBUS-DP module is not exchanging I/O data: I/O data exchanges start.
- If the PROFIBUS-DP module is exchanging I/O data: I/O data exchanges stop.

Point

For "Start/Stop PROFIBUS", I/O data exchanges are started or stopped by turning on and off 'Data exchange start request signal' (Y0).
Starting/stopping of I/O data exchanges may fail if "Start/Stop PROFIBUS" is executed while the program is running.

Set Slave Address

Changes the FDL address of the DP-Slaves with online.



Item	Description	Setting range
Old address	Sets the current FDL address of a DP-Slave. When the DP-Slave is selected in a project tree, the FDL address of a DP-Slave is displayed. When the DP-Master is selected in a project tree, input an arbitrary effective FDL address.	0 to 126
New address	Sets a new FDL address of a DP-Slave.	0 to 125
Ident-No.	Sets the Ident No. of the DP-Slave of which FDL address is to be changed. When the DP-Slave is selected in a project tree, the Ident No. of the selected DP-Slave is displayed. When the DP-Master is selected in a project tree, set the Ident No. in hexadecimal.	0H to FFFFH
Messages	Displays the new FDL address when the [Set] button is clicked. Below are examples of displayed messages. • FDL address change request has been sent: A request to change the FDL address was sent. • Failed to change FDL address: The system failed to change the FDL address. • For setting the slave address the data exchange on the PROFIBUS network must be stopped!: The FDL address cannot be changed during I/O data exchanges.	—

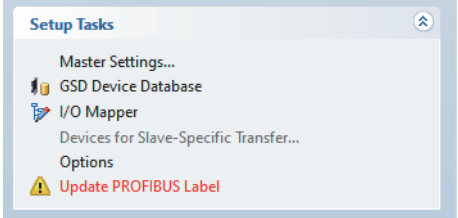
Precautions

"FDL address change request has been sent" in "Messages" indicates only a request to change the FDL address was sent successfully.

- Check that the FDL address has changed.
- The FDL address of DP-Slave can change only if the DP-Slave is supported by changing it from DP-Master. (📖 Manual for the DP-Slave)

Setup Tasks

This section describes the items of "Setup Tasks".



Item	Description	Reference
Master Settings	Sets the transmission speed, FDL address, bus parameters, refresh, or other items of the DP-Master.	• Page 106 Master Settings • Page 108 Bus Parameter Settings • Page 110 CPU Device Access
GSD Device Database	Operates the GSD database.	• Page 78 [Global GSD Database] tab • Page 82 [Project GSD Database] tab
I/O Mapper	Edits the configuration settings for accessing input/output of the DP-Slave.	Page 83 I/O Mapper
Devices for Slave-Specific Transfer	Opens the "CPU Device Access" window. This item can be selected by enabling "Slave specific transfer" in the "CPU Device Access" window in "Master Settings".	Page 85 Devices for Slave-Specific Transfer
Options	Sets the GSD file to be prioritized.	Page 85 Options
Update PROFIBUS Label	Creates and updates the structures used for global labels and module function blocks by enabling the refresh settings.	Page 86 Update PROFIBUS Label

[Global GSD Database] tab

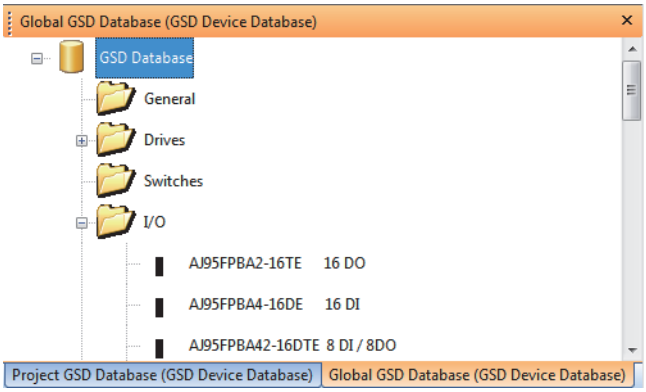
Click "GSD Device Database" to display the GSD database that batch manages DP-Slaves used on the PROFIBUS-DP network.

This item is used to add a DP-Slave device to be used in a project using the tree on the [Global GSD Database] tab.

The device group is displayed as a folder, and the device type of that group is displayed in the lower layer of the tree.

The device type is displayed using the device image and the type name.

The default image is displayed when an image unique to the device is not assigned. (☞ Page 80 Properties)



Right-clicking a folder or device type in the [Global GSD Database] tab displays the following items.

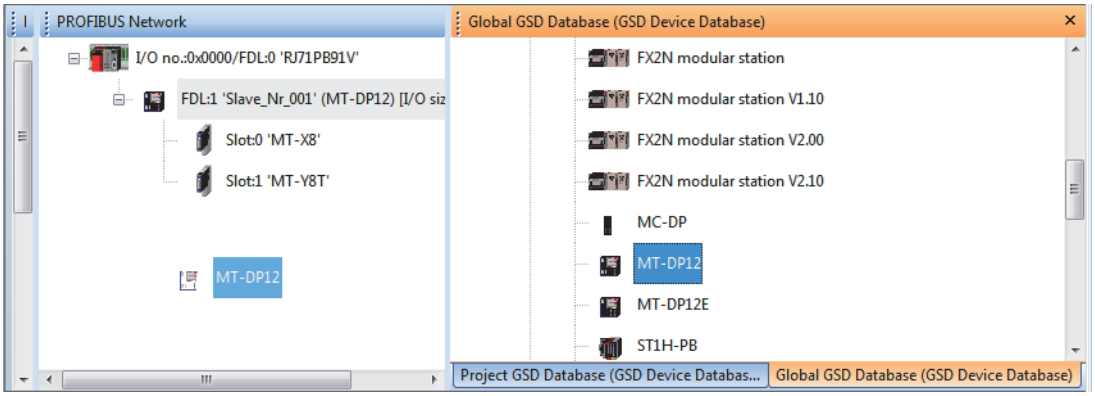
Item	Description	Reference
Add Slave to Project	Adds the selected DP-Slave to a project. DP-Slaves can be added also by dragging and dropping or double-clicking the DP-Slaves.	Page 79 Add Slave to Project
Add GSD File	Opens the window for selecting the GSD file. The selected GSD file is analyzed and added to the GSD database.	Page 79 Add GSD File
Import GSD Database	Imports the device type from the GSD database (.mdb), GSD export file (.ext), or GXDP project file.	Page 80 Import GSD Database
Properties	Opens the property window of the selected slave type. In the tree on the [Global GSD Database] tab, some property items can be changed. In the tree on the [Project GSD Database] tab, some property items can be read.	Page 80 Properties
Remove Type	Deletes the DP-Slave from the GSD database.	Page 82 Remove Type

■Add Slave to Project

Operating procedure

1. Perform any of the operations described below to add the DP-Slave to a project.

- Right-click the DP-Slave to be added to the project, and select "Add Slave to Project".
- Double-click the DP-Slave to be added to the project.
- Drag and drop the DP-Slave to be added to the project from the [Global GSD Database] tab to the "PROFIBUS Network" window.



2. The "Slave Settings" window is displayed. (☞ Page 113 Slave Settings)

3. When DP-Slave is set in the "Slave Settings" window, the DP-Slave is added to the "PROFIBUS Network" window, and the information on that DP-Slave is copied to the project file. The information on the DP-Slave that is copied to the project file can be checked in the [Project GSD Database] tab.

The DP-Slave information can be added or edited even when the project is opened on another personal computer because that information was copied to the project file.

When the project file contains the DP-Slave information of the selected type, the project file information is not changed.

Point

When the DP-Slave having a smaller FDL address than that of the existing DP-Slave is added, the buffer memory is re-assigned.

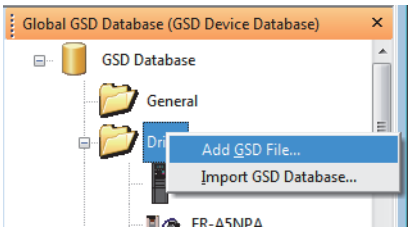
- When the parameter is changed, review the program and the refresh settings. (☞ Page 110 CPU Device Access)
- If the refresh settings are enabled, update the PROFIBUS labels again. (☞ Page 86 Update PROFIBUS Label)

■Add GSD File

Operating procedure

1. Open the file to be added.

[Global GSD Database] tab ⇨ Right-click ⇨ [Add GSD File]



2. The GSD file is analyzed and added to the GSD database.

When the GSD file refers to slave device images, PROFIBUS Configuration Tool automatically reads the images and saves them to the GSD database.

When applicable files do not exist, the default image is used alternatively. The image can be replaced with that unique to the device later. (☞ Page 80 Properties)

■Import GSD Database

This item can be imported the DP-Slave information from the existing GSD database (.mdb), GSD export file (*.ext), or GXDP project file when the DP-Slave information of device type does not exist in the GSD database.

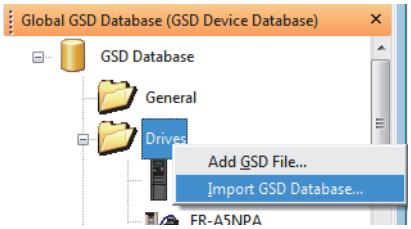
Point

The recommended method is to register the GSD (DDB) file to the GSD database using "AddGSDFile". If the information is imported using "Import GSD Database", the parameters in the old GSD (DDB) file may not be imported correctly.

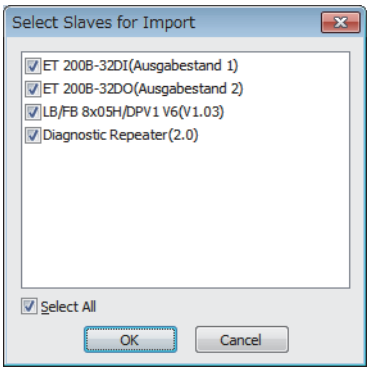
Operating procedure

1. Open the selection window.

[Global GSD Database] tab ⇨ Right-click ⇨ [Import GSD Database]



2. The list of the slave types that do not exist in the GSD database out of the files selected for import is displayed on the "Select Slaves for Import" window.

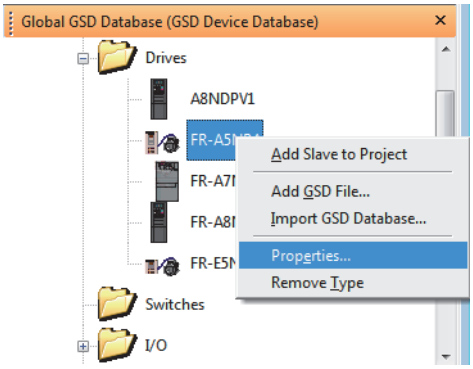


■Properties

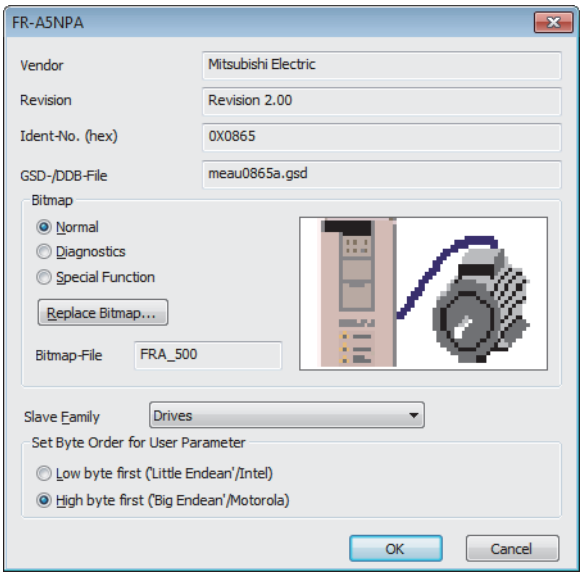
Operating procedure

1. Display the property window of the selected slave type.

[Global GSD Database] tab ⇨ Right-click the module for which to edit information ⇨ [Properties]



2. Change the settings and click the [OK] button. The information in the GSD database is changed.



Item	Description
Vendor	Displays the manufacturer of the DP-Slave.
Revision	Displays the version of the GSD file of the DP-Slave or the version of the device.
Ident-No.	Displays the Ident No. of the DP-Slave in hexadecimal.
GSD-/DDB-File	Displays the name of the GSD file of the DP-Slave.
Bitmap	Displays or changes the image registered in the GSD database. • Normal*1: The image for normal operation is displayed. • Diagnostics*1: The image for diagnostics is displayed. • Special Function*1: The image for special function is displayed.
[Replace Bitmap] button	Changes the image registered in the GSD database. Click this button to display the image data selection window. The specifications of images that can be registered are as follows. Other images cannot be displayed properly. • Height × width: 40 pixels ×70 pixels • Colors: 16 colors • Extension: .bmp or .dib
Bitmap-File	Displays the image name.
Slave Family	Selects the group of the module to be displayed in the [Global GSD Database] tab.
Set Byte Order for User Parameter*2	Changes the byte order (big-endian or little-endian) of user parameters set for the DP-Slave.*3 • Low byte first ('Little Endean'/Intel): Little-endian • High byte first ('Big Endean'/Motorola): Big-endian

*1 The image set for "Normal" is displayed in the [Global GSD Database] tab and the [Project GSD Database] tab.
The image set for "Diagnostics" or "Special Function" is not displayed.

*2 This item changes the byte order of user parameters.
To change the byte order of I/O data, use the slave parameter. (☞ Page 113 Slave Settings)

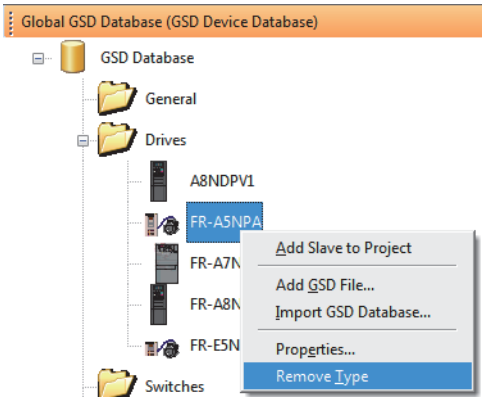
*3 For the byte order of newly added DP-Slaves, contact the manufacturer of each DP-Slaves.
Improper change may cause malfunction or damage of the module.

■Remove Type

Operating procedure

1. Display the confirmation window in the following operations.

[Global GSD Database] tab ⇨ Right-click the module to be deleted ⇨ [Remove Type]



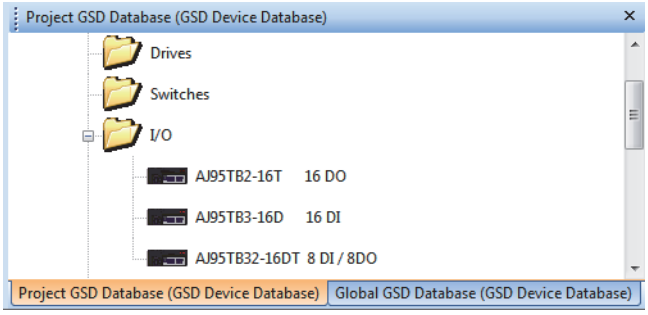
2. A confirmation window is displayed. Click the [Yes] button. The selected module is deleted from the GSD device database.

Point

The GSD file and the image of the device are not deleted. Delete those files manually.

[Project GSD Database] tab

Information on DP-Slaves in the current project file is displayed.



Right-clicking a folder or device type displays the following items.

Item	Description	Reference
Add/Replace GSD File	Directly adds the GSD file to a project, and replaces the existing entry of the same type as necessary.	Page 82 Add/Replace GSD File
Add Slave to Project	Adds the selected DP-Slave to a project. DP-Slaves can be added also by dragging and dropping or double-clicking the DP-Slaves.	Page 79 Add Slave to Project
Properties	Opens the property window of the selected slave type. In the tree on the [Global GSD Database] tab, some property items can be changed. In the tree on the [Project GSD Database] tab, some property items can be read.	Page 80 Properties

■Add/Replace GSD File

This item is used to directly add the GSD file to the specified project file. The [Global GSD Database] tab does not change.

Operating procedure

1. Open the file to be additionally registered/updated in the following operations.

[Project GSD Database] tab ⇨ Right-click ⇨ [Add/Replace GSD File]

I/O Mapper

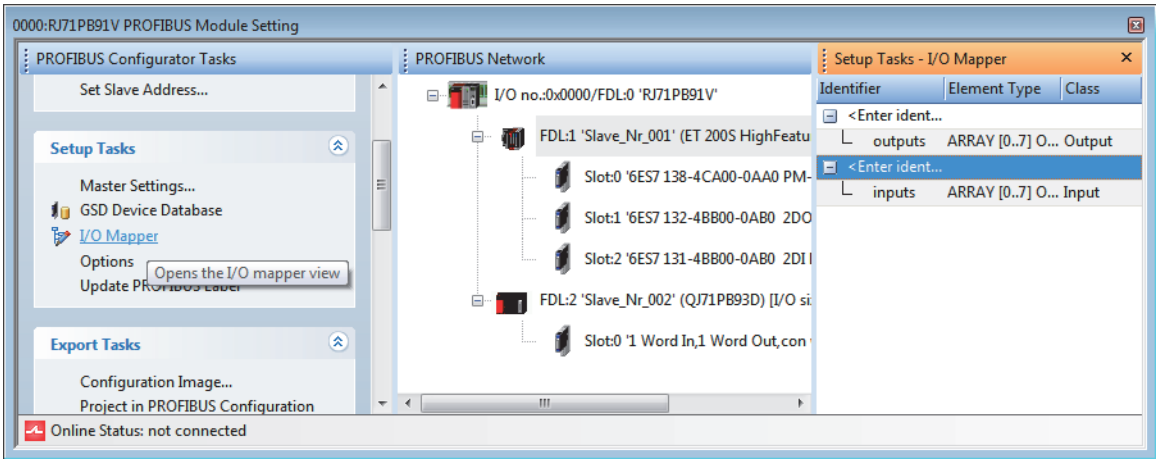
In I/O Mapping, names and data types can be edited for the DUT (structure) elements of the global labels created by updating the PROFIBUS labels.

Operating procedure

1. Display the "I/O Mapper" window.

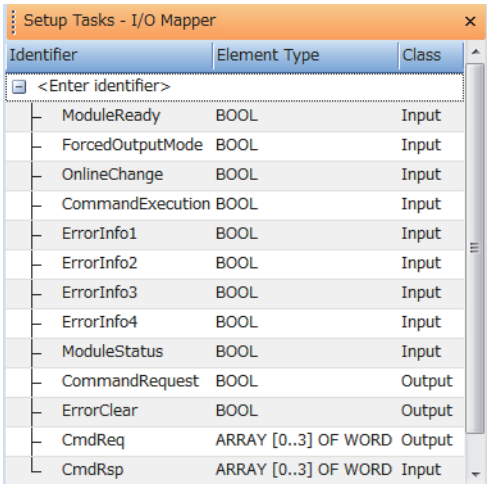
[Setup Tasks] ⇨ [I/O Mapper]

2. DUT is displayed in the "I/O Mapper" window when the DP-Slave to be set or the module mounted on the DP-Slave is selected in the "PROFIBUS Network" window.



3. Edit the DUT elements. The DUT names and data types edited are applied in the DUT of global labels created when updating the PROFIBUS labels.

■"I/O Mapper" window



Item	Description	Setting range
Identifier	Sets the global variable name and the DUT element name.	1 to 32 characters
Element Type	Sets the data type of the DUT element.	• ARRAY • BOOL • INT • WORD
Class	Sets the send direction of data handled by the DUT element. • Input: Input data (DP-Slave → CPU module) • Output: Output data (CPU module → DP-Slave)	Refer to the left column

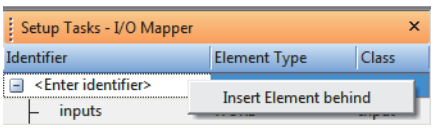
Point

The DUT type name is automatically set as follows. It cannot be set manually.
stSLV<FDL address of DP-Slave>MOD<slot number>_<serial number>
Example: Unit in slot 3 of the DP-Slave (FDL address 2): stSLV002MOD003_1

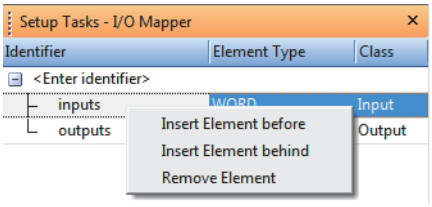
The configuration of DUT can be changed by inserting or deleting DUT elements.
However, DUT elements cannot be inserted or deleted to/from the module of which DUT elements are fixed.

[I/O Mapper] ⇨ Right-click

- When a row of the DUT variable is selected



- When a row of the DUT element is selected



Item	Description
Insert Element before	Adds a new DUT element to the row above the selected DUT element. If the new DUT element is added after the second element, the initial settings are copied from the above DUT element and a serial number is added to the name.
Insert Element behind	Adds a new DUT element to the row below the selected DUT element. The initial settings are copied from the above DUT element and a serial number is added to the name.
Remove Element	Deletes the selected DUT element.

Devices for Slave-Specific Transfer

Open the "CPU Device Access" window.

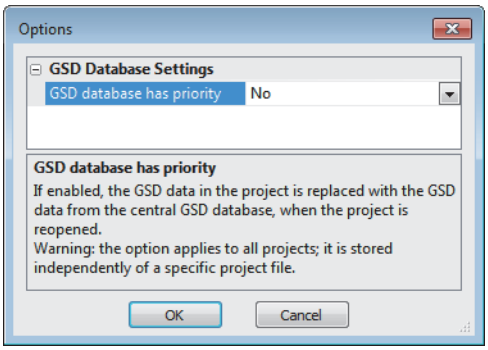
This item can be selected by enabling "Slave specific transfer" in the "CPU Device Access" window in "Master Settings".

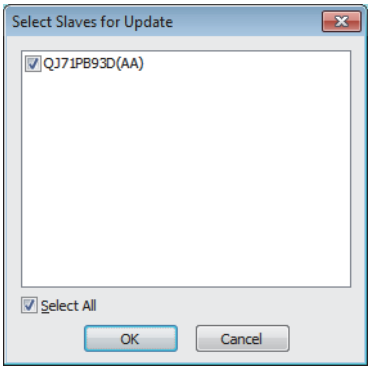
For details, refer to the following.

☞ Page 110 CPU Device Access

Options

Set the GSD file to be prioritized.



Item	Description	Setting range
GSD database has priority	Select the GSD file to be prioritized if the same GSD file exists in both the project and the GSD database. • No: Prioritizes the GSD file in the project. • Yes: Prioritizes the GSD file in the database. If "Yes" is selected, the following window is displayed when opening the project.  • OK: Information on the checked DP-Slaves is acquired from the GSD files in the GSD database. • Cancel: Information on all DP-Slaves is acquired from the GSD files in the project. If a GSD file exists in the project or GSD database, the DP-Slave is not displayed in the above window. The GSD file in one of these locations is used.	• No • Yes (Default: No)

Point

- If neither the project file nor the GSD database contains DP-Slave information, the project is not opened. Add the DP-Slave used in the project to the GSD database.
- If the GSD file in the project file is more recent than the GSD file in the GSD database, set "No" for "GSD database has priority".
- When the project is opened in GX Configurator-DP Version 6 or earlier, the GSD database is prioritized. If there is no DP-Slave information in the GSD database, the DP-Slave information is read from the GSD extraction file (*.ext). (☞ Page 80 Import GSD Database)

Update PROFIBUS Label

Updating the PROFIBUS label enables refresh settings and creates/updates structures to be used for the global labels and module function block.

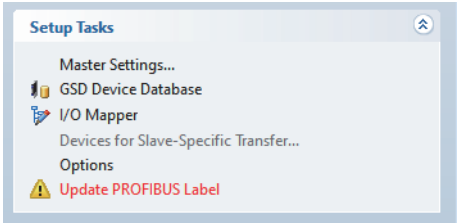
The PROFIBUS labels need to be updated in the following operations. However, the PROFIBUS labels need not to be updated if the program is created to skip the following operations.

- When enabling the refresh settings (with the data consistency function enabled) (☞ Page 110 CPU Device Access)
- When using global label in a program (☞ Page 197 I/O signals of DP-Master and global label compatibility list, Page 197 I/O signals of DP-Master and global label compatibility list)
- When using function blocks in a program
- When changing the I/O data from byte arrays to word arrays in the DP-Slave settings (☞ Page 88 Unregistered program)

Operating procedure

1. In the following cases, "Update PROFIBUS Label" is displayed in red text and a warning icon appears.

- When the PROFIBUS labels have never been updated with PROFIBUS Configuration Tool
- When the refresh settings or settings that affect the program are changed

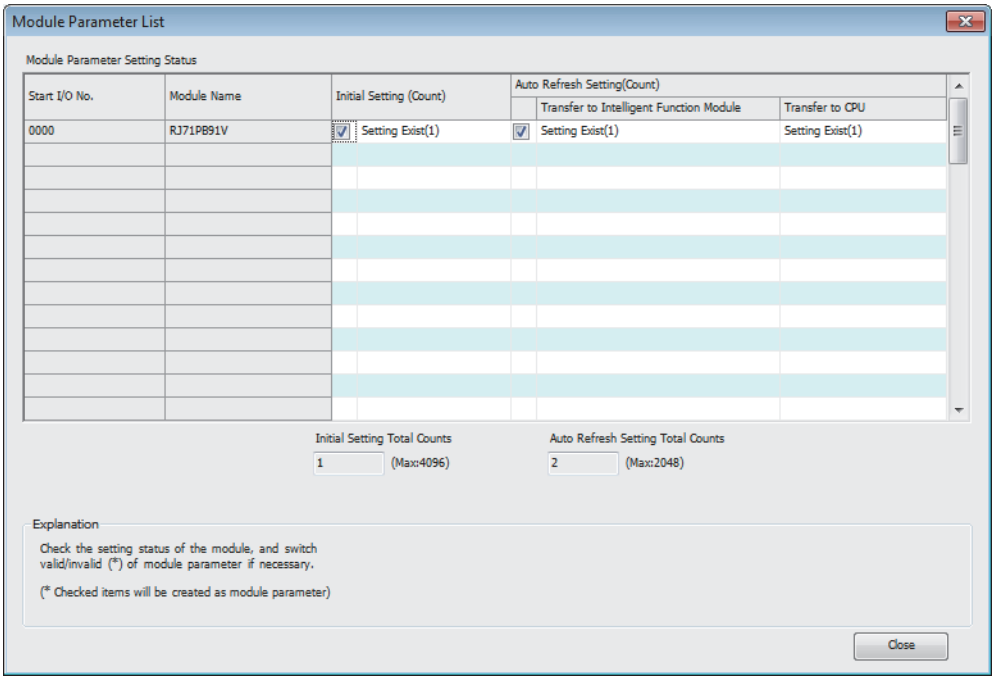


2. Enable the refresh settings. (☞ Page 110 CPU Device Access)

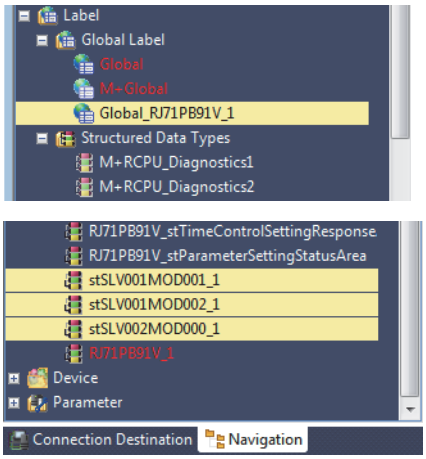
3. Click "Update PROFIBUS Label".

4. Check that the refresh settings are enabled.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Module Parameter List]



5. The following global labels and structures are created and displayed.



Precautions

- Do not change names of the created global labels and structures. If the names are changed, delete corresponding global labels and structures. Then update PROFIBUS label again.
- The number (_1,_2...) is added automatically to the ending for names of the created global labels and some structures. These numbers cannot change to any numbers since these numbers are used for identification in PROFIBUS Configuration Tool.

Do not register global labels and structures with the following names since they are used when PROFIBUS labels are updated.

If they are registered, PROFIBUS labels cannot be updated.

- Global labels with a name starting with "Global_RJ71PB91V..."
- Structures with a name starting with "RJ71PB91V..."
- Structures with a name starting with "stSLV..."

Restriction

The structures can be created up to 800. If the structures exceed 800, update of PROFIBUS labels have completed with an error.

In this case, delete the created structures (start with "RJ71PB91V...) manually. Uncheck "Use label for slaves" in the "CPU Device Access" window then update PROFIBUS labels again. (☞ Page 110 CPU Device Access)

■Unregistered program

When updating PROFIBUS labels, if either of the following conditions is met, an unregistered program for I/O data transfer (iQRPBPOU_n) is automatically generated. Register it as an initial execution type program.

Condition		Description
1	A module that handles data in units of bytes is used in the PROFIBUS-DP network configuration, and a DP-Slave that requires the adjustment of data layout is registered.	A program that changes data of byte arrays to data of word arrays is generated.
2	"Slave specific transfer" is enabled in the "CPU Device Access" window.	A program for data transfer is generated according to the CPU device settings assigned in the "CPU Device Access" window.

Ex.

When the PROFIBUS labels are updated under condition 1

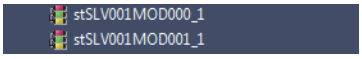
In the following system configurations, two bytes of data from slot 1 MT-Y16T are assigned to the top byte of the first word and the bottom byte of the second word in the buffer memory and separated as a word data.

"Unregistered Program" that are automatically generated when the PROFIBUS labels are updated are registered as "Scan". Create a program with the structures of these programs to enable I/O data to be assigned regardless of whether the data consists of a byte array or word array.

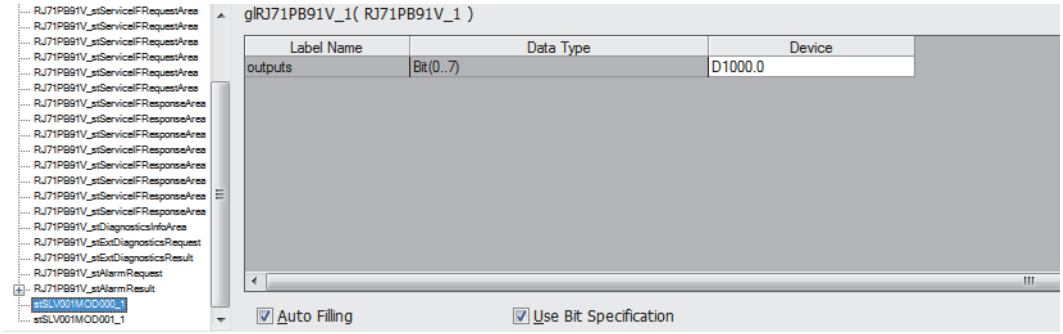
Operating procedure

1. Update the PROFIBUS labels and check that the structures have been created and assigned. At this time, checking "Adding POU code to start the PROFIBUS network" will automatically generate a program to turn on 'Data exchange start request signal' (Y0). (Default: Not checked)

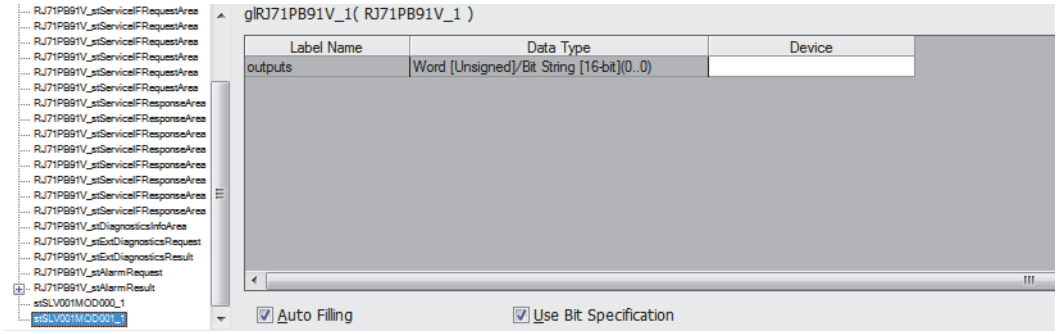
[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Settings] ⇨ [PROFIBUS Configurator Tasks] ⇨ [Setup Tasks] ⇨ [Update PROFIBUS Label]



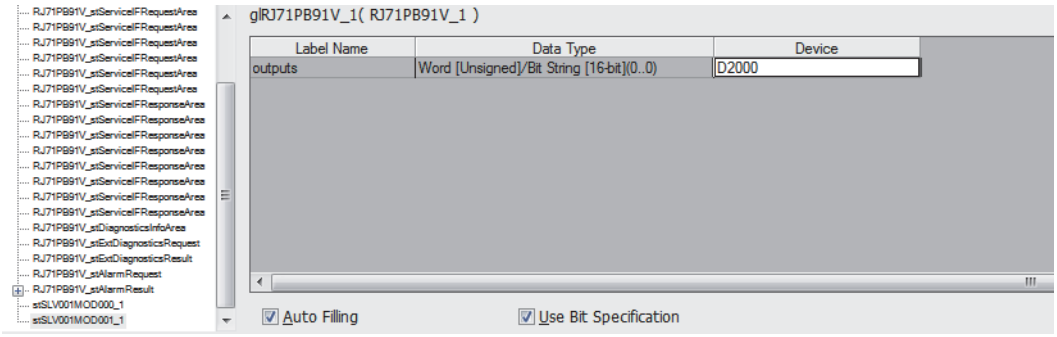
D1000.0 to D1000.7 are assigned to stSLV001_MOD000_1 for one byte of slot 0 MT-Y8T.



stSLV001_MOD001_1 is not assigned to the device but for two bytes of slot 1 MT-Y16T.



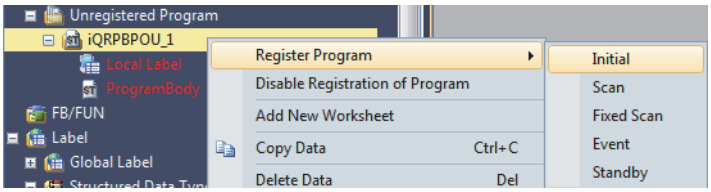
2. D2000 is assigned to stSLV001_MOD001_1.



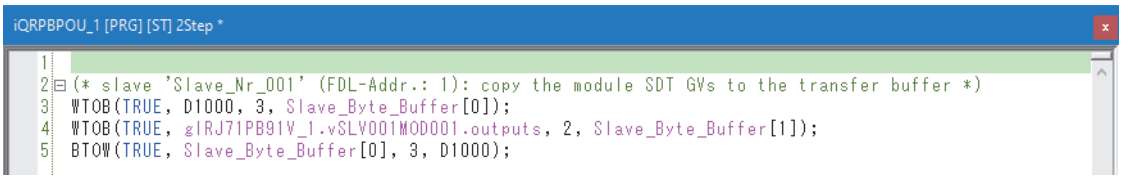
3. Create a program for output.

(0) Set 1H for slot 0 MT-Y8T and FFFFH for slot 1 MT-Y16T.

4. Right-click iQRPBPOU_1, which was generated in "Unregistered Program", and select "Scan" to register it.

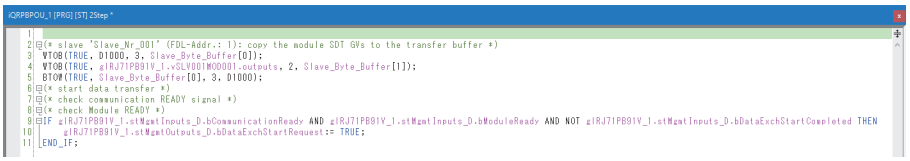


- Content of the generated unregistered program (When "Adding POU code to start the PROFIBUS network" is not checked)



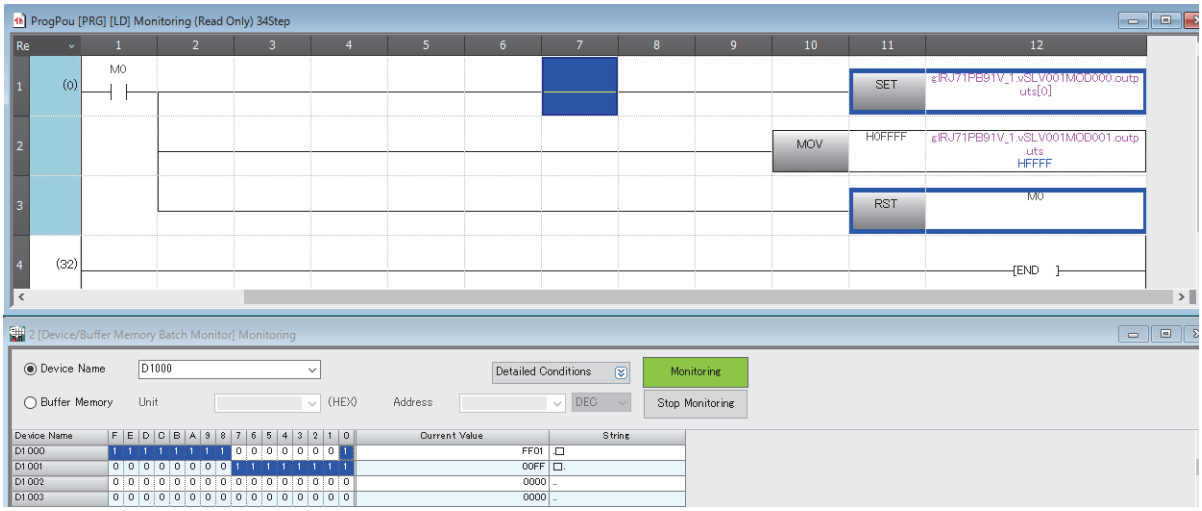
3: Separates 16-bit binary data in and after D1000 into 3 bytes and stores in the lower 8 bits in and after Slave_Byte_Buffer[0].
4: Separates 16-bit binary data in and after gIRJ71PB91V_1.vSLV001MOD001.outputs[0] into 2 bytes and stores in the lower 8 bits in and after Slave_Byte_Buffer[1].
5: Combines the lower 8 bits of 16-bit binary data of three words stored in and after Slave_Byte_Buffer [0] in units of words and stores in and after D1000.

- Content of the generated unregistered program (When "Adding POU code to start the PROFIBUS network" is checked)



3: Separates 16-bit binary data in and after D1000 into 3 bytes and stores in the lower 8 bits in and after Slave_Byte_Buffer[0].
4: Separates 16-bit binary data in and after gIRJ71PB91V_1.vSLV001MOD001.outputs[0] into 2 bytes and stores in the lower 8 bits in and after Slave_Byte_Buffer[1].
5: Combines the lower 8 bits of 16-bit binary data of three words stored in and after Slave_Byte_Buffer [0] in units of words and stores in and after D1000.
10: Turns on 'Data exchange start request signal' (Y0) when 'Communication READY signal' (X1B) and 'Module ready signal' (X1D) are on and 'Data exchange start completed signal' (X0) is off.

5. Check the operation.



The data of Slot 1 MT-Y16T which have been divided in bit arrays are combined and stored as word arrays by iQRPBPOU_1.

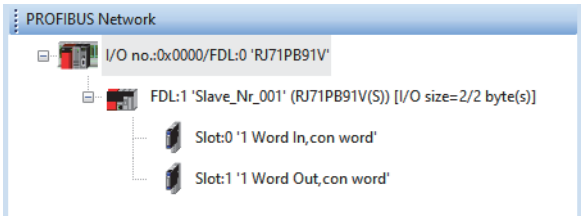
Precautions

If a program to turn on 'Data exchange start request signal' (Y0) has already been created, do not check "Adding POU code to start the PROFIBUS network". Doing so may turn on 'Data exchange start request signal' (Y0) at the different timing with the created program.

Ex.

When the PROFIBUS labels are updated under condition 2

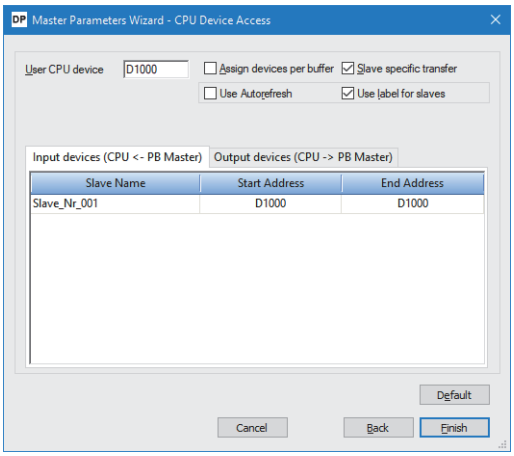
• System configuration



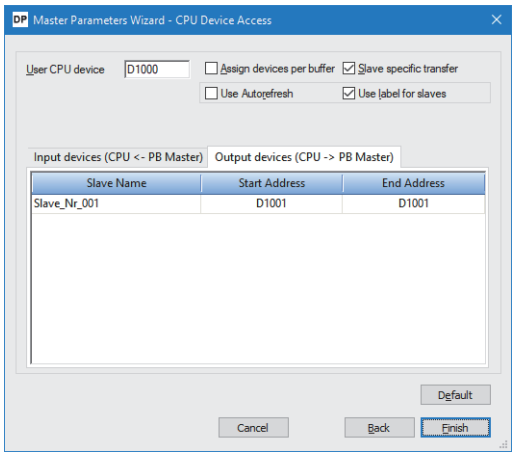
• Content of "CPU Device Access"

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ [PROFIBUS Network] ⇨ Right-click the master module ⇨ [Master Settings] ⇨ [Next] button

• [Input devices (CPU <- PB Master)] tab



• [Output devices (CPU -> PB Master)] tab

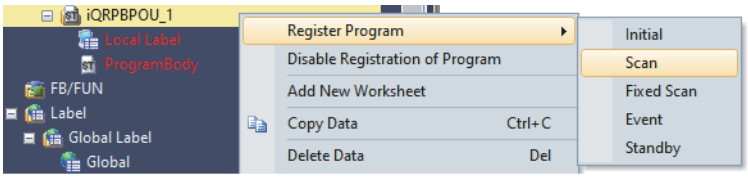


Operating procedure

1. Update the PROFIBUS labels. At this time, checking "Adding POU code to start the PROFIBUS network" will automatically generate a program to turn on 'Data exchange start request signal' (Y0). (Default: Not checked)

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Settings] ⇨ [PROFIBUS Configurator Tasks] ⇨ [Setup Tasks] ⇨ [Update PROFIBUS Label]

2. Right-click iQRPBPOU_1, which was generated in "Unregistered Program", and select "Scan" to register it.

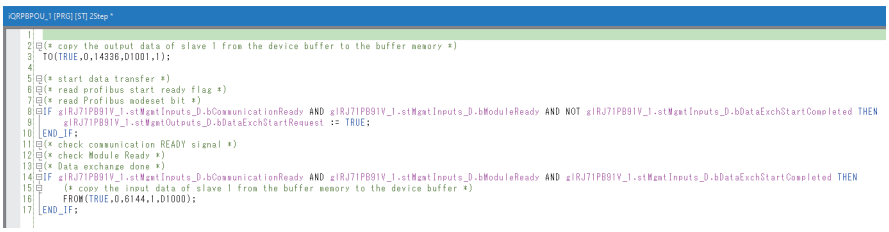


• Content of the generated unregistered program (When "Adding POU code to start the PROFIBUS network" is not checked)

```
iQRPBPOU_1 [PRG] [ST] 2Step *
 1
 2 (* copy the output data of slave 1 from the device buffer to the buffer memory *)
 3  TO(TRUE,0,14336,D1001,1);
 4
 5 (* check communication READY signal *)
 6 (* check Module Ready *)
 7 (* Data exchange done *)
 8 IF gIRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady AND gIRJ71PB91V_1.stMgmtInputs_D.bModuleReady AND gIRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted THEN
 9     (* copy the input data of slave 1 from the buffer memory to the device buffer *)
10     FROM(TRUE,0,6144,1,D1000);
11 END_IF;
```

3: For the data in 14336 of the buffer memory, transfers data amounting to one word to D1001.
10: For the data in D1000, transfers data amounting to one word to 6144 of the buffer memory.

• Content of the generated unregistered program (When "Adding POU code to start the PROFIBUS network" is checked)



3: For the data in 14336 of the buffer memory, transfers data amounting to one word to D1001.
9: Turns on 'Data exchange start request signal' (Y0) when 'Communication READY signal' (X1B) and 'Module ready signal' (X1D) are on and 'Data exchange start completed signal' (X0) is off.
16: For the data in D1000, transfers data amounting to one word to 6144 of the buffer memory.

Point

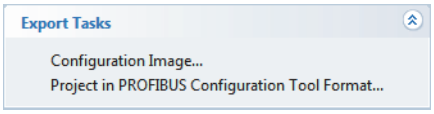
Do not change the name of a program generated by updating the PROFIBUS labels.
If the name is changed, delete the generated program and update the PROFIBUS labels again to generate a program.

Precautions

If a program to turn on 'Data exchange start request signal' (Y0) has already been created, do not check "Adding POU code to start the PROFIBUS network". Doing so may turn on 'Data exchange start request signal' (Y0) at the different timing with the created program.

Export Tasks

This section describes the items for "Export Tasks".



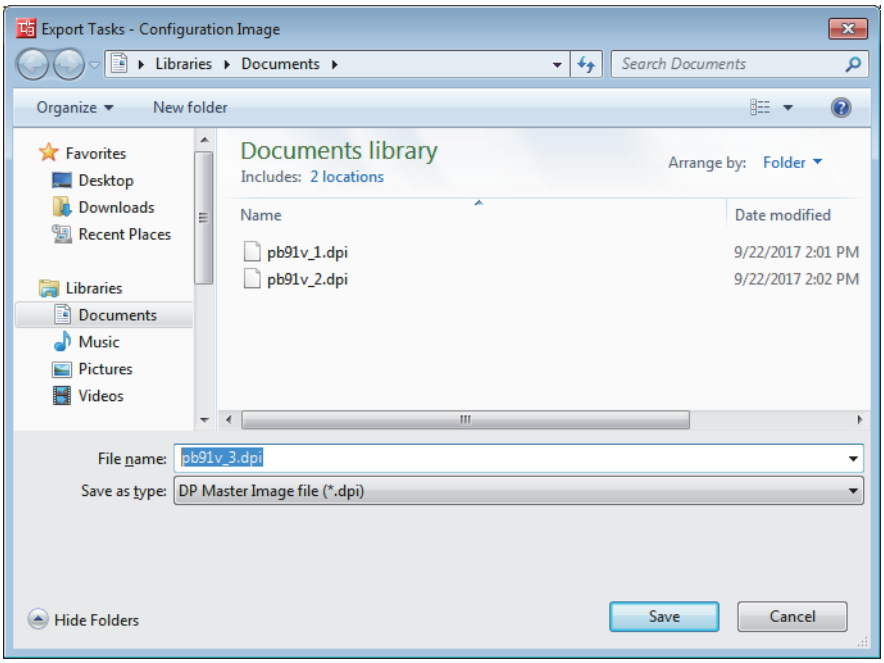
Item	Description
Configuration Image	Creates a configuration image, and saves it to a file.
Project in PROFIBUS Configuration Tool Format	Exports a project file in PROFIBUS Configuration Tool format.

Configuration Image

Creates a configuration image, and saves it to a file.

Clicking "Configuration Image" displays a window to select the save destination of the configuration image file created from the current project.

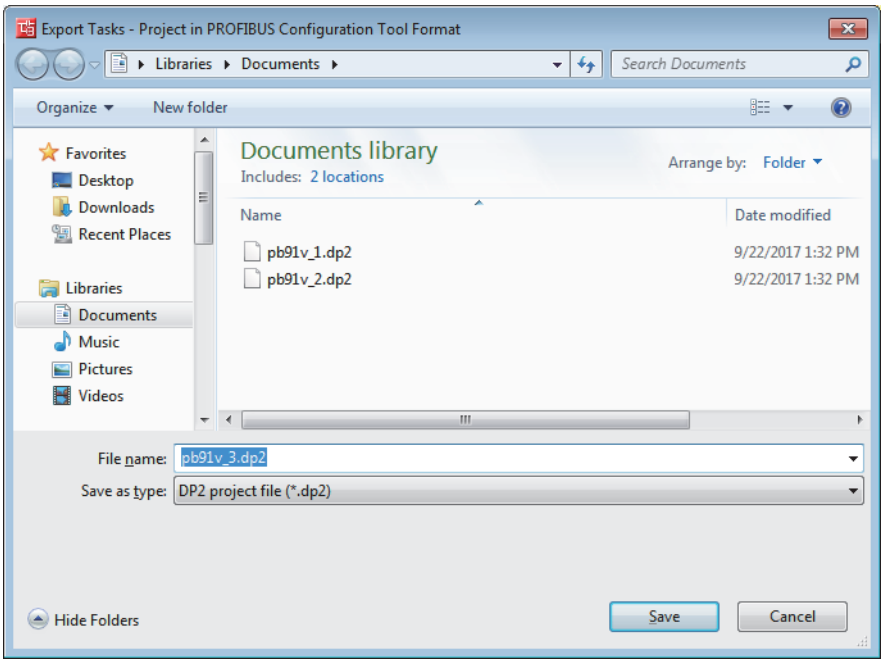
The content of the configuration image file is unique to each type of the DP-Master.



Project in PROFIBUS Configuration Tool Format

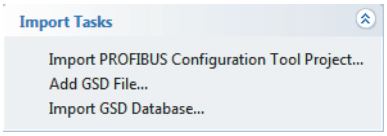
Exports a project file in PROFIBUS Configuration Tool format.

Clicking "Project in PROFIBUS Configuration Tool Format" displays a window to select the save destination of the current project.



Import Tasks

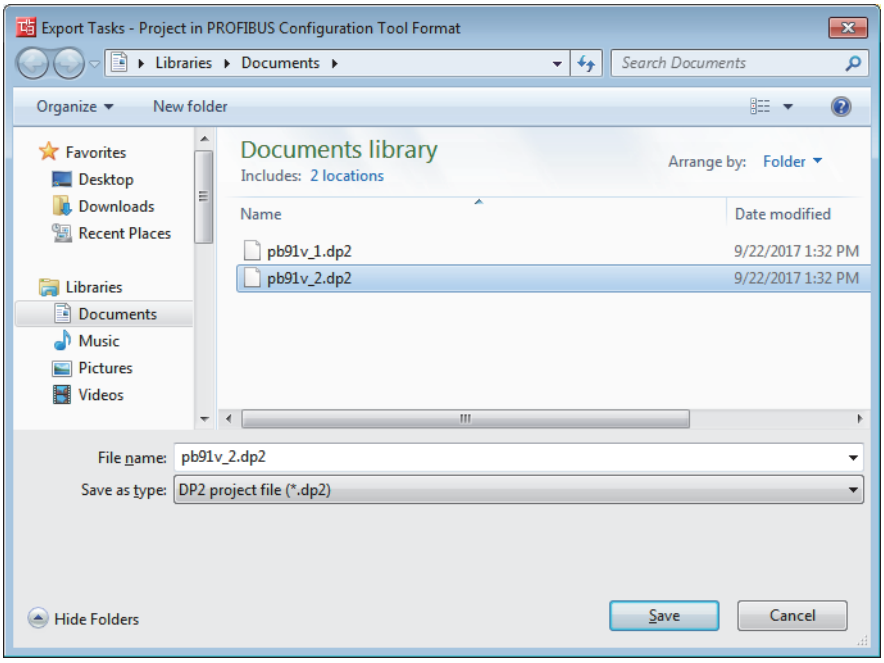
This section describes the items for "Import Tasks".



Item	Description
Import PROFIBUS Configuration Tool Project	Imports a PROFIBUS Configuration Tool project file.
Add GSD File	Adds the content of a GSD file to the device database.
Import GSD Database	Imports device types from the GSD database or the project file.

Import PROFIBUS Configuration Tool Project

Imports a PROFIBUS Configuration Tool project file.



Point

- The start I/O number of the RJ71PB91V saved in the PROFIBUS Configuration Tool project is not imported. The start I/O number set in the engineering tool takes priority.
- A project of the QJ71PB92V created in GX Configurator-DP can be imported. Before importing the project of the PROFIBUS master module other than the QJ71PB92V, convert it to the project of the QJ71PB92V using GX Configurator-DP.
- A project exported with a new version of PROFIBUS Configuration Tool cannot be read with an older version of PROFIBUS Configuration Tool.

Add GSD File

For "Add GSD File", refer to the following.

☞ Page 79 Add GSD File

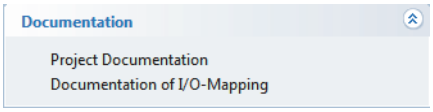
Import GSD Database

For "Import GSD Database", refer to the following.

☞ Page 80 Import GSD Database

Documentation

This section describes the items for "Documentation".

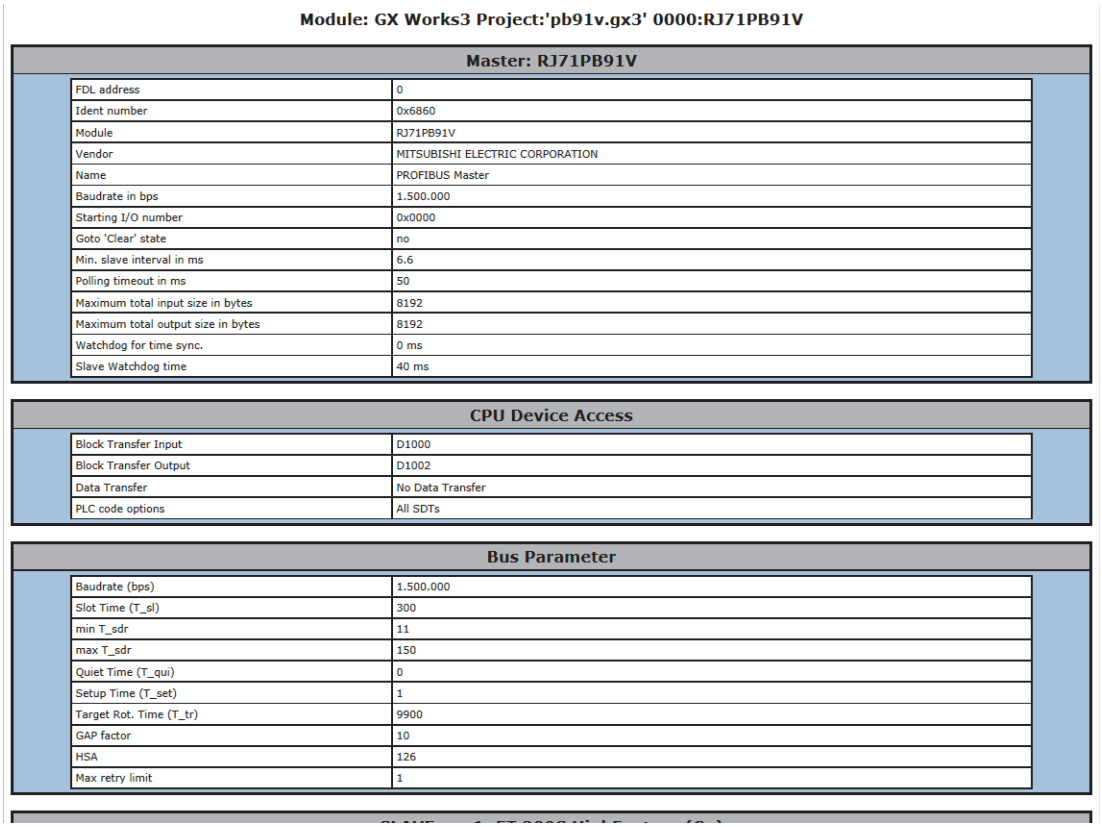


Item	Description
Project Documentation	Displays the setting details of the project on the Web browser.
Documentation of I/O-Mapping	Displays the setting details of I/O Mapping on the Web browser.

Project Documentation

This item is used to display the setting details of the project on the Web browser.

The setting details can be printed or saved in HTML files using the corresponding function of the Web browser.



Module: GX Works3 Project:'pb91v.gx3' 0000:RJ71PB91V

Master: RJ71PB91V

FDL address	0
Ident number	0x6860
Module	RJ71PB91V
Vendor	MITSUBISHI ELECTRIC CORPORATION
Name	PROFIBUS Master
Baudrate in bps	1.500.000
Starting I/O number	0x0000
Goto 'Clear' state	no
Min. slave interval in ms	6.6
Polling timeout in ms	50
Maximum total input size in bytes	8192
Maximum total output size in bytes	8192
Watchdog for time sync.	0 ms
Slave Watchdog time	40 ms

CPU Device Access

Block Transfer Input	D1000
Block Transfer Output	D1002
Data Transfer	No Data Transfer
PLC code options	All SDTs

Bus Parameter

Baudrate (bps)	1.500.000
Slot Time (T_sl)	300
min T_sdr	11
max T_sdr	150
Quiet Time (T_qui)	0
Setup Time (T_set)	1
Target Rot. Time (T_tr)	9900
GAP factor	10
HSA	126
Max retry limit	1

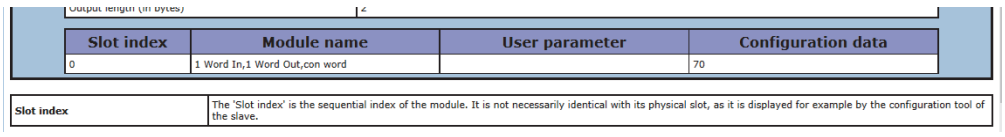
Point

"Project Documentation" lists the modules selected on each DP-Slave.

"Slot index" shows the serial numbered index of the module.

"Slot index" is displayed in the configuration tool of the DP-Slave as an example, so it may be different from the mounting slot number.

"Slot index" is explained at the bottom of "Project Documentation".



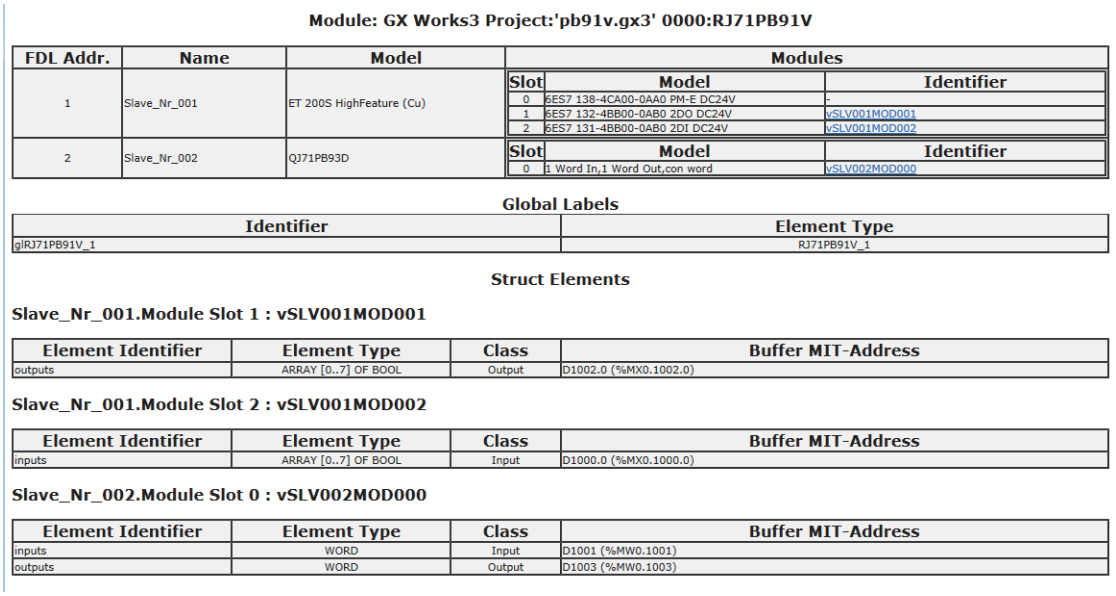
Slot index	Module name	User parameter	Configuration data
0	1 Word In,1 Word Out,con word		70

Slot index	The 'Slot index' is the sequential index of the module. It is not necessarily identical with its physical slot, as it is displayed for example by the configuration tool of the slave.

Documentation of I/O-Mapping

This item is used to display the setting details of I/O Mapping on the Web browser.

The setting details can be printed or saved in HTML files using the corresponding function of the Web browser.



Module: GX Works3 Project:'pb91v.gx3' 0000:RJ71PB91V

FDL Addr.	Name	Model	Modules		
			Slot	Model	Identifier
1	Slave_Nr_001	ET 200S HighFeature (Cu)	0	6ES7 138-4CA00-0AA0 PM-E DC24V	-
			1	6ES7 132-4BB00-0AB0 2DO DC24V	vSLV001MOD001
			2	6ES7 131-4BB00-0AB0 2DI DC24V	vSLV001MOD002
2	Slave_Nr_002	QJ71PB93D	Slot	Model	Identifier
			0	1 Word In,1 Word Out,con word	vSLV002MOD000

Global Labels

Identifier	Element Type
gRJ71PB91V_1	RJ71PB91V_1

Struct Elements

Slave_Nr_001.Module Slot 1 : vSLV001MOD001

Element Identifier	Element Type	Class	Buffer MIT-Address
outputs	ARRAY [0..7] OF BOOL	Output	D1002.0 (%MX0.1002.0)

Slave_Nr_001.Module Slot 2 : vSLV001MOD002

Element Identifier	Element Type	Class	Buffer MIT-Address
inputs	ARRAY [0..7] OF BOOL	Input	D1000.0 (%MX0.1000.0)

Slave_Nr_002.Module Slot 0 : vSLV002MOD000

Element Identifier	Element Type	Class	Buffer MIT-Address
inputs	WORD	Input	D1001 (%MW0.1001)
outputs	WORD	Output	D1003 (%MW0.1003)

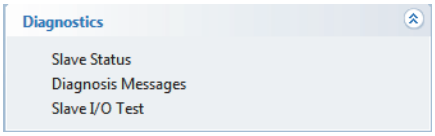
Point

"Buffer MIT-Address" displays the CPU module device for the transfer source and transfer destination assigned to "CPU Device Access" in the "Master settings" window. (☞ Page 110 CPU Device Access)

- When a bit device is assigned to the transfer buffer, "Buffer MIT-Address" column for the bit device is left blank because I/O Mapping does not support the bit device.
- The "Buffer MIT-Address" column of the bit device is blank even when the refresh settings are disabled. Check that the buffer memory areas are assigned as 'Address information area (for mode 3)' (Un\G22528 to Un\G22777), 'Input data start address area (for mode 3)' (Un\G22784 to Un\G22908), and 'Output data start address area (for mode 3)' (Un\G22912 to Un\G23036).

Diagnostics

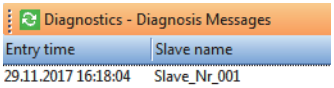
This section describes the items for "Diagnostics".



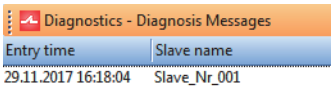
Item	Description
Slave Status	Checks the communication status of the PROFIBUS-DP network.
Diagnosis Messages	Checks the diagnostic information from each DP-Slave.
Slave I/O Test	Tests the input/output of the DP-Slave by reading/writing the I/O data of the DP-Slave assigned to the buffer memory of the master module.

The current communication status is displayed via the window name icon for the windows opened by clicking each item.

- Online



- Offline



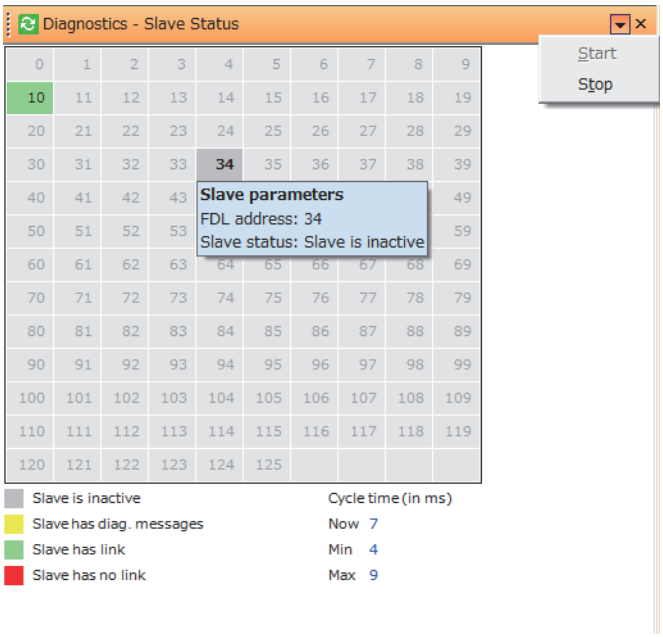
Point

- The "Diagnostics" function can be executed only during I/O data exchanges and when the structure is matched between the parameter settings of the DP-Master and the project.
- In a redundant system, monitor of DP-Slaves is continued even if the system switching is executed when "Control System" is set in "Specify Redundant CPU" of the "Specify Connection Destination Connection" window.

Slave Status

Checks the communication status of the PROFIBUS-DP network.

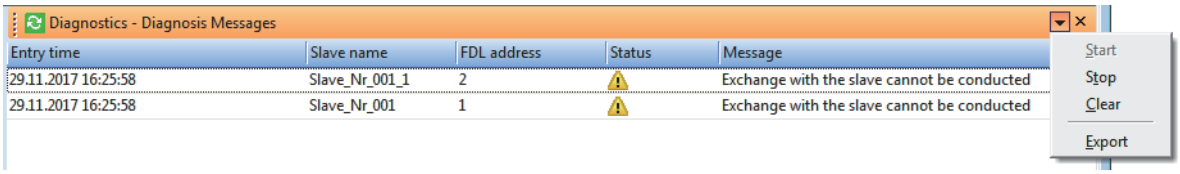
All the device addresses in the PROFIBUS-DP network are displayed, and the DP-Slave statuses are indicated by corresponding colors.



Item	Description
0 to 125	Displays the DP-Slave status. Number shown in each cell is an FDL address. • Light gray: This FDL address is unused. • Dark gray: This DP-Slave is set as a reserved station. • Yellow: This DP-Slave has diagnostic information. • Green: I/O data exchanges are in progress. • Red: I/O data exchanges with the DP-Slave have failed. Diagnostic information may be displayed in the "PROFIBUS Diagnosis" window. By double-clicking a colored rectangle, the detailed information is displayed in a tooltip.
Cycle time	Displays the bus cycle time. (Unit: ms) • Now: Current bus cycle time value • Min: Minimum bus cycle time value • Max: Maximum bus cycle time value
Start	Starts refresh of the window.
Stop	Stops refresh of the window.

Diagnosis Messages

Check the diagnostic information from each DP-Slave.



Item	Description
Entry time	Displays the occurrence date and time of the diagnostic information.
Slave name	Displays the name specified for "Name" in the "Slave Settings" window.
FDL address	Displays the FDL address of the DP-Master or DP-Slave that has the diagnostic information or the extended diagnostic information.
Status	Displays "!" when the diagnostic information is issued.
Message	Displays the details of the diagnostic information.
Start	Starts refresh of the window.
Stop	Stops refresh of the window.
Clear	Deletes all diagnostic information.
Export	Exports the diagnostic information as a CSV file.

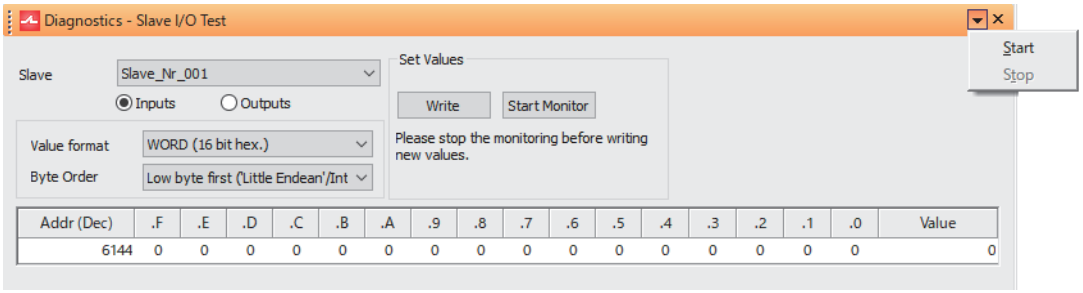
Point

Up to 1000 messages can be displayed in the "Diagnosis Messages" window.
When the number of messages exceeds 1000, the oldest message is deleted and a new message is added.

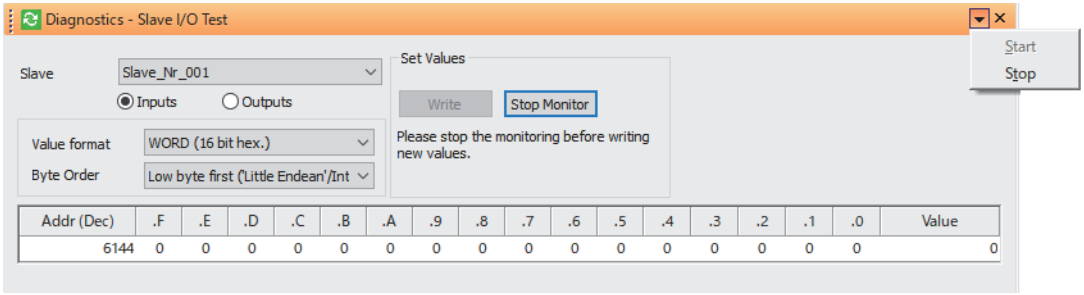
Slave I/O Test

Monitor and edit the I/O data of the DP-Slave assigned to the buffer memory of the master module.

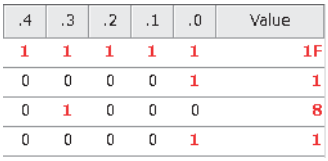
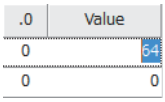
• Before monitoring starts



• After monitoring starts

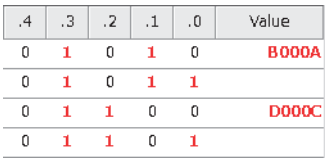


Item	Description
Slave	Selects the monitor target DP-Slave.
Inputs/Outputs	Selects the monitor target data. • Inputs: Input data • Outputs: Output data
Value format	Selects the data type of the "Value". • WORD (16 bit hex.): One word unsigned hexadecimal • DWORD (32 bit hex.): Two word unsigned hexadecimal • INT (16 bit decimal): One word signed decimal • DINT (32 bit decimal): Two word signed decimal • REAL (float number): Two words • STRING (ASCII character): ASCII character
Byte Order	Selects the byte order (big-endian or little-endian) of "Value". • Low byte first ('Little Endean'/Intel): The lower byte consists of the lower address • High byte first ('Big Endean'/Motorola): The upper byte consists of the lower address
[Write] button	Writes the values changed using ".F to .0" or "Value" to the buffer memory of the master module. This button can be used while monitoring is stopped.
[Start Monitor] button Start	Starts monitoring.
[Stop Monitor] button Stop	Stops monitoring.
Addr	Displays the decimal buffer memory address of the master module of the monitor target data.
.F to .0	Displays each bit of the monitor target data. When the buffer memory value is changed during monitoring, the changed value is displayed in red bold font. Addr (Dec) .F .E .D .C .B .A .9 .8 .7 .6 .5 .4 .3 .2 .1 .0 Value 14336 0 0 0 0 0 0 0 0 0 0 0 0 0 0 **1** **0** **2** To apply the changes to the buffer memory, double-click the changed value while monitoring is stopped, and click the [Write] button. Upon applying the changes to the buffer memory of the master module, the bold font returns to the regular font. To check the buffer memory address and the bit position, move the mouse pointer to the cell. .6 .5 .4 .3 .2 **0** **1** 0 0 0 Word 14336.Bit 6 0 0 0 0 0

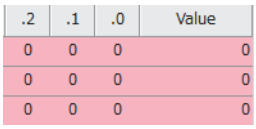
Item	Description
Value	Displays the value of the monitor target data in the data type selected for "Value format". When the buffer memory value is changed during monitoring, the value is displayed in red bold font.  To enter a value, double-click a cell while the monitoring is stopped.  To apply the changes to the buffer memory, click the [Write] button. Upon applying the changes to the buffer memory of the master module, the bold font returns to the regular font.

During monitoring, values that have been changed since the first update are displayed in red bold font.

When the monitoring is stopped, values remain highlighted until the monitoring is resumed or the buffer is edited.

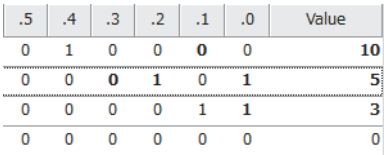


The background of the table turns light red from the start of refresh until the value of the DP-Master is updated.



Changed values during editing are displayed in black bold font.

Upon successfully completing the writing of values to the PROFIBUS-DP module, all the highlight displays are cleared.



Point

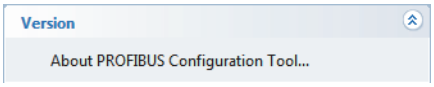
When I/O data exchanges are started, the slave input in the buffer memory is overwritten. Therefore, the table may not indicate the actual buffer content.

In addition, data may be overwritten when the slave output is as follows:

- When the CPU module is not stopped. (Data is overwritten by the program.)
- When the refresh settings are enabled. (Data is overwritten by the values in the CPU device of the refresh source.)

Version

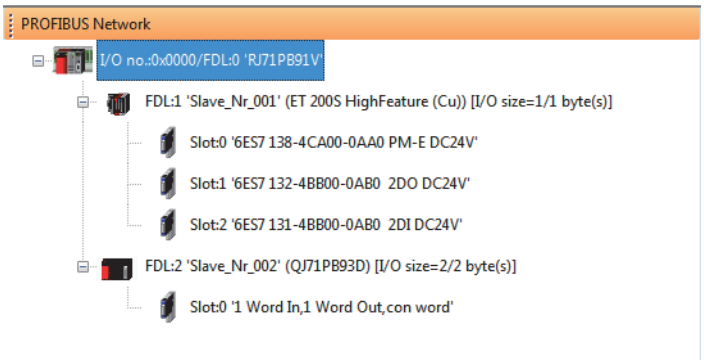
This section describes the items for "Version".



Item	Description
About PROFIBUS Configuration Tool	Displays the version of PROFIBUS Configuration Tool. (☞ Page 122 Checking the Software Version)

3.3 "PROFIBUS Network" Window

This section describes the tree display of modules comprising the PROFIBUS-DP network.



Type	Icon	Description
DP-Master	Icon for the RJ71PB91V	I/O: <start I/O number>/FDL:<FDL address> '<model name>' • Display example I/O: no.:0x0/FDL:0 'RJ71PB91V'
DP-Slave	Icon unique to the slave type acquired from the device database	FDL: <FDL address> '<slave name>' (<model name>) [I/O size=<input byte size>/<output byte size> byte(s)] • Display example FDL: 1 'Slave_Nr_001' (QJ71PB93D) [I/O size=40/38 byte(s)]
Module	Fixed icon common to all the module types	Slot: <slot number (serial numbered index)> '<model name>' • Display example Slot: 0 '1 Word In,1 Word Out,con word'

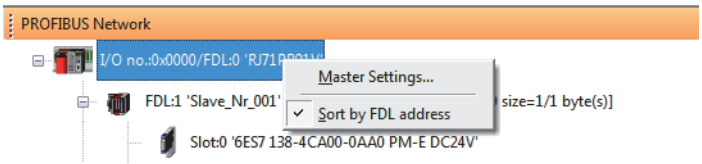
Point

- The tree for a newly created project contains a master module. DP-Slaves are not contained. To add DP-Slaves to the project, refer to an information icon that appears under the master module. This information icon is automatically deleted when the DP-Slave is added to the project.

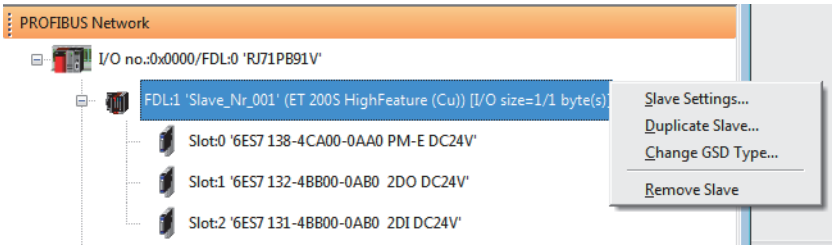
- When multiple DP-Slaves are added to the project, they are set in order of their FDL address.

The following describes the functions that can be operated by right-clicking the "PROFIBUS Network" window.

- For the DP-Master



- For the DP-Slave



Item	Description	Reference
Master Settings	Displays the "Master Settings" window. The "Master Settings" window is also displayed by double-clicking the DP-Master.	• Page 106 Master Settings • Page 108 Bus Parameter Settings • Page 110 CPU Device Access
Sort by FDL address	Sets the display order of DP-Slaves. • Checked: DP-Slaves are displayed in ascending order of the FDL addresses. • Not checked: DP-Slaves are displayed in alphabetical order of the station names.	—
Slave Settings	Displays the "Slave Settings" window. The "Slave Settings" window is also displayed by double-clicking the DP-Slave or dragging and dropping to the "PROFIBUS Network" window in [Global GSD Database] tab of DP-Slave.	Page 113 Slave Settings
Duplicate Slave	Duplicates the DP-Slave.	—
Change GSD Type	Changes the GSD type of the DP-Slave.	—
Remove Slave	Deletes the DP-Slave.	—

Precautions

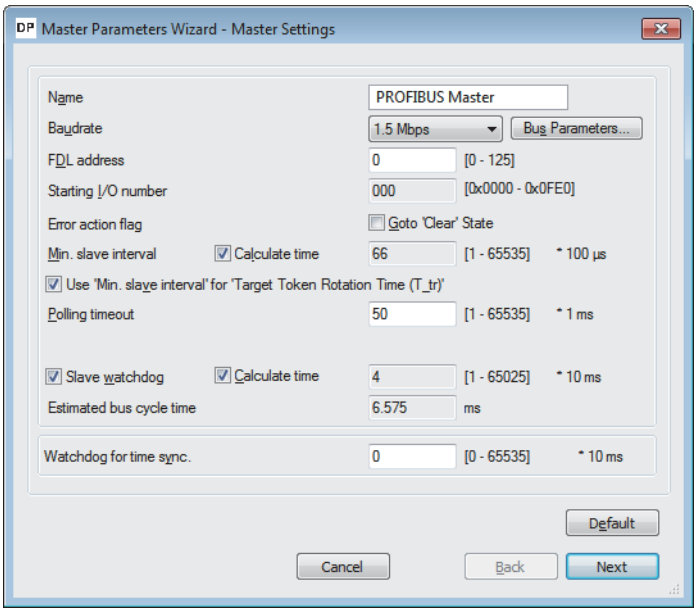
Set the master parameter, bus parameter and slave parameter values so that the following conditions are met.
They can be set for PROFIBUS Configuration Tool when these conditions are met.

- "Min. slave interval" in the master parameters<"Slave watchdog" in each slave parameter
- "Min. slave interval" in the master parameters<upper limit of DP-Master GSD file
- "min T_sdr" in the bus parameters<"max T_sdr" in the bus parameters
- "Quiet Time (T_qui)" in the bus parameters<"min T_sdr" in the bus parameters
- "max T_sdr" in the bus parameters<"T_sl" in the bus parameters
- "T_sl" in the bus parameters<"Target Rot. Time (T_tr)"
- "Slave watchdog" in each slave parameter>"Target Rot. Time (T_tr)" in the bus parameters

Master Settings

Set the master parameters (transmission speed, FDL address, or other items of the DP-Master).

[PROFIBUS Network] ⇨ Right-click the master module ⇨ [Master Settings]



Item		Description	Setting range
Name		Sets the master module name.	1 to 16 alphanumeric characters (Default: PROFIBUS Master)
Baudrate		Sets the transmission speed of the PROFIBUS-DP network. All the DP-Slaves should support the transmission speed to be set. Turn off the power of the DP-Slave when changing the transmission speed. When the power is turned off, the DP-Slave synchronize with the new transmission speed.	9.6kbps to 12Mbps (Default: 1.5Mbps)
[Bus Parameters] button		Sets the bus parameters. For the bus parameters, refer to the following. ☞ Page 108 Bus Parameter Settings	—
FDL address		Sets the FDL address.	0 to 125 (Default: 0)
Starting I/O number		Displays the start I/O number set in the RJ71PB91V property window or the I/O number assignment page in the CPU parameters.	—
Error action flag/Goto 'Clear' State		Checks this box to send the clear request to all the DP-Slaves from the DP-Master. When a communication error has occurred even on one DP-Slave, the clear request is sent to all the DP-Slaves. • Not checked: The clear request is not sent to all the DP-Slaves. • Checked: The clear request is sent to all the DP-Slaves.	• Checked • Not checked (Default: Not checked)
Min. slave interval	—	Sets the minimum required time (MSI) from a slave polling cycle to the next slave polling cycle. (Unit: 100µs) This setting value is effective against all the DP-Slaves connected. Set the value for the DP-Slave that requires the longest time. When "Min. slave interval" is smaller than the value calculated from Pt (polling time), Tsdi (request or response processing time ÷ transmission speed [bps] of the RJ71PB91V), and Lr (data refresh time of the RJ71PB91V), it may take time to process the PROFIBUS-DPV1 and the PROFIBUS-DPV2 functions.	1 to 65535
	Calculate time	Checks this box to automatically set "Min. slave interval" based on the predicted bus cycle time.	• Checked • Not checked (Default: Checked)
Use 'Min. slave interval' for 'Target Token Rotation Time (T_tr)'		Checks this box to automatically set "Min. slave interval" to the value set for "Target Rot. Time (T_tr)" of the bus parameter. When multiple DP-Masters exist in the PROFIBUS-DP network, checking this box is not necessary. T_tr is set to the sum of "Min. slave interval" of all the DP-Masters.	• Checked • Not checked (Default: Checked)
Polling timeout		Sets the maximum time required for the requester to receive the response during communications between DP-Masters. (Unit: 1ms)	1 to 65535 (Default: 50)

Item		Description	Setting range
Slave watchdog	—	Checks this box to collectively set the communication watchdog timer value for all the DP-Slaves.	• Checked • Not checked (Default: Checked)
	Calculate time	• Checked: An optimal value for "Slave watchdog" is set automatically. • Not checked: Set an any value for "Slave watchdog". (Unit: 10ms, default: 3) The automatically set value is five times of "Min. slave interval".	• Checked • Not checked (1 to 65025) (Default: Checked)
Estimated bus cycle time		Displays the predicted minimum interval of the bus cycle time. (Unit: ms) (☞ Page 197 I/O signals of DP-Master and global label compatibility list) The bus cycle time becomes longer than the time displayed when communication or acyclic communication with other master module is performed. When "Min. slave interval" or "Slave watchdog" uses the value displayed in this item, set sufficient time in consideration of time required for communication or acyclic communication with other master module.	—
Watchdog for time sync.		Sets the time for monitoring the transmission interval of the clock data from the time master. (Unit: 10ms)	0 to 65535 (Default: 0)

Bus Parameter Settings

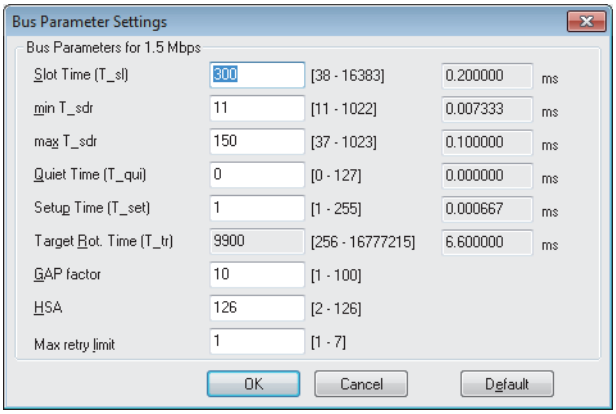
Set the bus parameters of the PROFIBUS-DP network.

[Master Settings] ⇨ [Bus Parameters] button

Point

Use the default bus parameters normally.

To change the bus parameters, knowledge about the PROFIBUS-DP standards is required.



Item	Description	Setting range
Slot Time (T_sl)	Sets the slot time (ms) (the maximum time for waiting responses). (Unit: TBit)*1 When the time set for this item is exceeded, an error occurs.	38 to 16383 (Default: 300)
min T_sdr	Sets the minimum response time (ms) of the DP-Slave. (Unit: TBit)*1	11 to 1022 (Default: 11)
max T_sdr	Sets the maximum response time (ms) of the DP-Slave. (Unit: TBit)*1	37 to 1023 (Default: 150)
Quiet Time (T_qui)	Sets the time required for switching the send direction of the repeater. (Unit: TBit)*1 Set this item to 0 when the repeater is not used.	0 to 127 (Default: 0)
Setup Time (T_set)	Sets the setup time. (Unit: TBit)*1	1 to 255 (Default: 1)
Target Rot. Time (T_tr)	Sets the target token rotation time. (Unit: TBit)*1 The time is set automatically when checked "Use 'Min. slave interval' for 'Target Token Rotation Time (T_tr)'" in the "Master Settings" window (default setting). When the box is unchecked, set the time manually. (☞ Page 106 Master Settings)	256 to 16777215 (Default: The "Min. slave interval" value of TBit)*2
GAP factor	Sets the constant for controlling the GAP update time (T_gud).	1 to 100 (Default: 10)
HSA	Sets the maximum FDL address of DP-Slaves in the line.	2 to 126 (Default: 126)
Max retry limit	Sets the maximum number of retries for each send data.	1 to 7 (Default: 1)

*1 TBit is a unit in which one indicates the time it takes to send one bit of data. When a TBit value is input for each item, it is automatically converted to ms and the converted value is displayed by "ms" on the right side. For the conversion method, refer to the following.
☞ Page 272 Bus cycle time

*2 For the "Min. slave interval" setting, refer to the following.
☞ Page 106 Master Settings

Precautions

The max T_sdr, Quiet Time (T_qui) and Setup Time (T_set) settings in the bus parameters must match the maximum values of devices connected to the PROFIBUS-DP network, including the DP-Master. The default values are as follows.

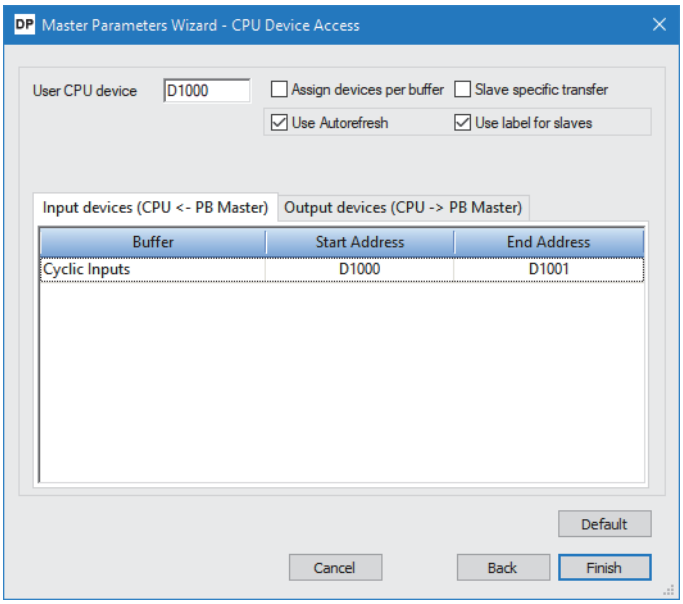
Item	Transmission speed					
	9.6kbps, 19.2kbps, 45.45kbps, 93.75kbps, 187.5kbps	500kbps	1.5Mbps	3Mbps	6Mbps	12Mbps
max T_sdr	60	100	150	250	450	800
Quiet Time (T_qui)	0	0	0	3	6	9
Setup Time (T_set)	1	1	1	4	8	16

CPU Device Access

Set the refresh setting.

Check the "Slave specific transfer" or "Use Autorefresh" to enable this item.

[Master Settings] ⇨ [Next] button



Item	Description	Setting range
User CPU device	Sets the start address of the CPU module acting as the transfer source device or the transfer destination device. With the device set as the start device, the range of each buffer memory area is automatically assigned. The set devices will be disabled when "Assign devices per buffer" is checked.	The following devices can be set.*1 • D • W • R • ZR (Default: D1000)
Assign devices per buffer	Selects a method for assigning refresh settings or a transfer program (iQRPBPOU_n). • Not checked: Batch assignment Devices (Input devices and Output devices) to each buffer memory area are assigned in a batch. • Checked: Individual assignment Devices (Input devices and Output devices) to each buffer memory area are assigned individually.	• Checked • Not checked (Default: Not checked)
Slave specific transfer	Select whether to automatically generate a transfer program (iQRPBPOU_n) to transfer I/O data in the slave station between the buffer memory and a device. • Not checked: A transfer program is not automatically generated. I/O data are stored from the start point into the input data area and output data area. When the refresh settings are used, the data are refreshed in a batch to the devices set in the "CPU Device Access" window. The data consistency function can be used when this item is unchecked. • Checked (Use Autorefresh unchecked): A transfer program is automatically generated. A storage location for I/O data in a slave station can be set individually. The data consistency function cannot be used when this item is checked. • Checked (Use Autorefresh checked): A transfer program is not automatically generated. Autorefresh can be performed by setting a storage location for I/O data per DP-Slave.*3 The data consistency function is available.	• Checked • Not checked (Default: Not checked)
Use Autorefresh	Selects enabling/disabling of the refresh settings. • Not checked: The refresh settings are disabled. • Checked: The refresh settings are enabled. Selects enabling/disabling of the refresh setting*3 "Data Consistency" in "Application Setting" is changed to "Disable" when this item is unchecked. (☞ Page 61 Module parameter).	• Checked • Not checked (Default: Checked)
Use label for slaves*2	Selects whether the DP-Slave structures are created or not. • Checked: DP-Slave structures are created. • Not checked: DP-Slave structures are not created.	• Checked • Not checked (Default: Checked)

Item		Description	Setting range
[Input devices (CPU <- PB Master)] tab, [Output devices (CPU -> PB Master)] tab	Buffer	Displays the buffer memory area of the RJ71PB91V acting as the transfer source device or the transfer destination device. ■When "Slave specific transfer" is unchecked The buffer name ("Cyclic Inputs" or "Cyclic Outputs") is displayed. • Cyclic Inputs: Configured by the device number to which the input data of the DP-Slave is copied from 'Input data area (for mode 3)' (Un\G6144 to Un\G10239). • Cyclic Outputs: Configured by the device number from which the output data of the DP-Slave is copied to 'Output data area (for mode 3)' (Un\G14336 to Un\G18431). ■When "Slave specific transfer" is checked Displays the name of a DP-Slave in the network.	—
	Start Address	Sets the start address of the CPU module acting as the transfer source device or the transfer destination device. The set values will be disabled when "Assign devices per buffer" is unchecked.	The following devices can be set.*1 • D0 to D10117631 • W0 to W9A61FF • R0 to R32767 • ZR0 to ZR10027007 (Default: Refer to the following.) • Input devices (CPU <- PB Master) tab: D1000 • Output devices (CPU -> PB Master) tab: D1000 + input word size
	End Address	Displays the last address of the CPU module acting as the transfer source device or the transfer destination device.	—

*1 Note that the setting range does not exceed each device range of the CPU module. (MELSEC iQ-R CPU Module User's Manual (Application))
When "Use label for slaves" is unchecked, any number can be entered as the device range with PROFIBUS Configuration Tool even the number is out of range. However, if the number is out of device range, an error code 2281H: parameter error (refresh) appears when the project is written to the CPU module.

*2 This item can be selected only when "Use Autorefresh" or "Slave specific transfer" is checked.
The checkbox for this item is fixed to unchecked when "Use Autorefresh" and "Slave specific transfer" are unchecked.

*3 When the version of the engineering tool is Ver1.090U or later and the version of PROFIBUS Configuration Tool is Ver1.06G or later, both "Slave Specific Transfer" and "Use Auto Refresh" can be checked.

Operation according to a combination of setting items

The following table shows operations according to combinations of setting items when the PROFIBUS labels are updated.

For details on how to update PROFIBUS labels, refer to the following.

☞ Page 86 Update PROFIBUS Label

○: Checked, ×: Not checked

Assign devices per buffer	Slave specific transfer	Use Autorefresh	Use label for slaves	Operation when the PROFIBUS labels are updated			
				Transfer method	Slave SDT label	Method for device assignment to each buffer memory area	Program (POU)
×	×	○	○	Auto refresh	Created	Batch assignment	Not created*1*3
×	×	○	×	Auto refresh	Not created	Batch assignment	Not created
○	×	○	○	Auto refresh	Created	Individual assignment	Not created*1*3
○	×	○	×	Auto refresh	Not created	Individual assignment	Not created
×	○	×	○	DP-Slave specific	Created	Batch assignment	Created*2*3
×	○	×	×	DP-Slave specific	Not created	Batch assignment	Created*2*3
○	○	×	○	DP-Slave specific	Created	Individual assignment	Created*2*3
○	○	×	×	DP-Slave specific	Not created	Individual assignment	Created*2*3
—	○	○	—	Cannot be set			
○	○*4	○*4	○	Auto refresh	Created	Individual assignment	Not created*1*3
○	○*4	○*4	×	Auto refresh	Not created	Individual assignment	Not created
×	○*4	○*4	○	Auto refresh	Created	Batch assignment	Not created*1*3
×	○*4	○*4	×	Auto refresh	Not created	Batch assignment	Not created
○ or ×	×	×	—	None	Not created	—	Not created

*1 Creates a program if more than one DP-Slave requires data adjustment in word format. (☞ Page 88 Unregistered program).
*2 Creates a program for copying data. (☞ Page 88 Unregistered program).
*3 The following message and checkbox are appeared when generating an unregistered program.
"Adding POU code to start the PROFIBUS network"
Placing a checkmark in the checkbox will automatically generate a program to turn on 'Data exchange start request signal' (Y0). (☞ Page 88 Unregistered program)
*4 When the version of the engineering tool is Ver1.090U or later and the version of PROFIBUS Configuration Tool is Ver1.06G or later, both "Slave Specific Transfer" and "Use Auto Refresh" can be checked.

Restrictions due to the version of PROFIBUS Configuration Tool

If the version of PROFIBUS Configuration Tool when the project is opened is older than the version of PROFIBUS Configuration Tool when that project was stored, part of the refresh settings may be changed.

The following table shows combinations of versions.

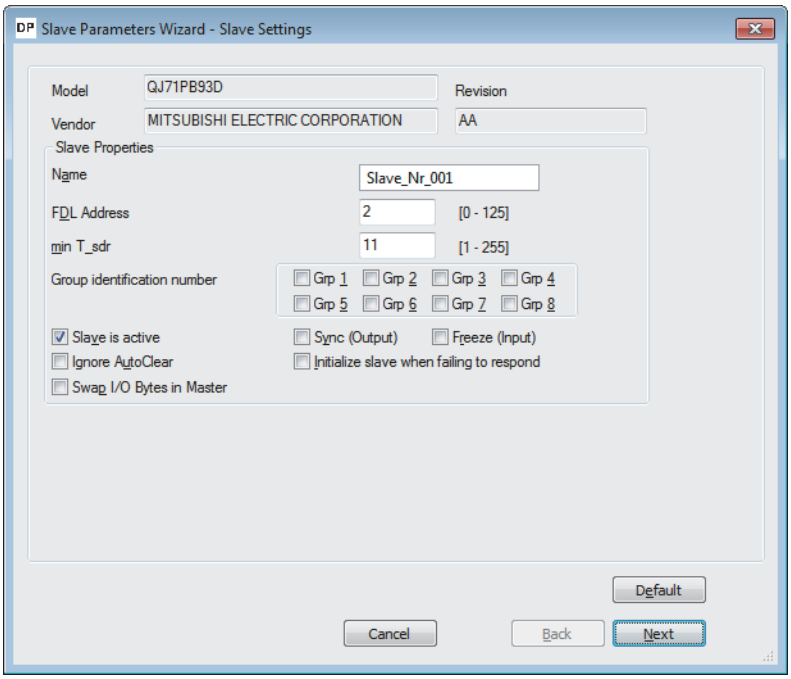
<table>
<tr><th rowspan="2">Version of PROFIBUS Configuration Tool when the project is opened</th><th colspan="3">Items checked when the project was stored and the version of PROFIBUS Configuration Tool</th></tr>
<tr><th>Use Autorefresh</th><th>Slave specific transfer</th><th>Use Autorefresh & Slave specific transfer</th></tr>
<tr><th></th><th>1.00A—1.06G or later</th><th>1.04E—1.06G or later*1</th><th>1.06G or later*2</th></tr>
<tr><td>1.00A</td><td rowspan="6">There are no changes.</td><td rowspan="4">The setting is cleared.</td><td rowspan="5">Use Autorefresh: There are no changes.
Slave specific transfer: The setting is cleared.</td></tr>
<tr><td>1.01B</td></tr>
<tr><td>1.02C</td></tr>
<tr><td>1.03D</td></tr>
<tr><td>1.04E</td><td rowspan="2">There are no changes.</td></tr>
<tr><td>1.05F</td></tr>
<tr><td>1.06G or later</td><td></td><td>There are no changes.</td></tr>
</table>

*1 This item does not exist for Ver1.03D or earlier.
*2 This combination is not supported for Ver1.05F or earlier.

Slave Settings

Set the slave parameters.

[PROFIBUS Network] ⇨ Right-click the DP-Slave ⇨ [Slave Settings]



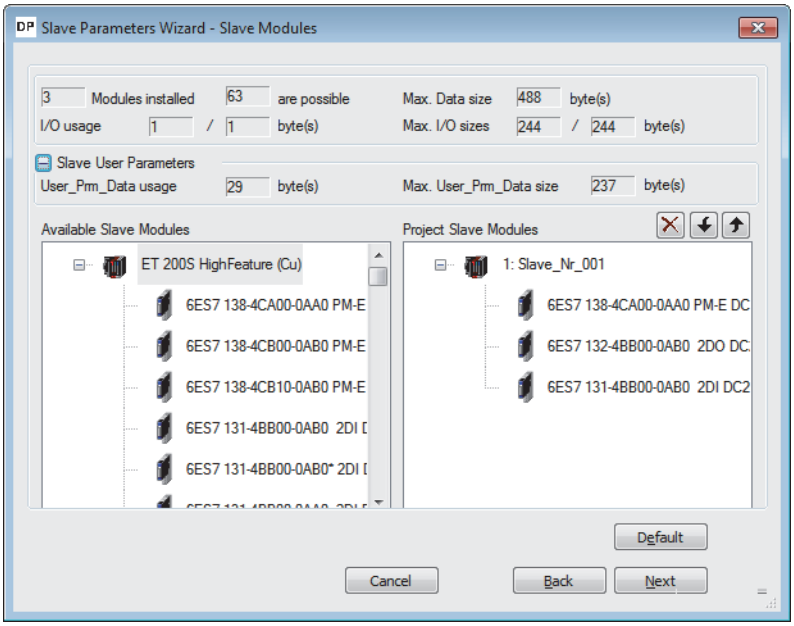
Item	Description	Setting range
Model	Displays the model name of the DP-Slave.	—
Vendor	Displays the manufacturer of the DP-Slave.	—
Revision	Displays the version of the GSD file or that of the device.	—
Name	Sets the name of the DP-Slave.	Up to 16 alphanumeric characters
FDL Address	Sets the FDL address.	0 to 125
min T_sdr	Sets the minimum response time for sending the response frame from the DP-Slave to the master module.	1 to 255
Group identification number	Sets the group number (Grp 1 to Grp 8) of the DP-Slave. Multiple group numbers can be set. The group number set in this item is used for the global control function service (SYNC, UNSYNC, FREEZE, and UNFREEZE). • Not checked: Not belong to the relevant group number. • Checked: Belong to the relevant group number.	• Not checked • Checked (Default: Not checked)
Slave is active	Unchecks this box to set the DP-Slave as a reserved station. • Not checked: Set the DP-Slave as a reserved station. • Checked: Set the DP-Slave as the station that perform I/O data exchanges.	• Not checked • Checked (Default: Checked)
Sync (Output)	Checks this box to check whether the DP-Slave supports the SYNC function during initialization communications. When the DP-Slave does not support the SYNC function, the diagnostic information is stored in 'Diagnostic information' (Un\G23072 to Un\G23321) of the master module. This item can be set when the DP-Slave supports this function. • Not checked: Not perform the function check. • Checked: Perform the function check.	• Not checked • Checked (Default: Not checked)
Freeze (Input)	Checks this box to check whether the DP-Slave supports the FREEZE function during initialization communications. When the DP-Slave does not support the FREEZE function, the diagnostic information is stored in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) of the master module. This item can be set when the DP-Slave supports this function. • Not checked: Not perform the function check. • Checked: Perform the function check.	• Not checked • Checked (Default: Not checked)

Item	Description	Setting range
Ignore AutoClear	Checks this box when a clear request is not sent by a communication error detect of the DP-Slave since the setting in the "Error action flag" of the master parameter is to send it to all DP-Slaves in a communication error occurrence. (☞ Page 106 Master Settings) • Not checked: Enable the "Error action flag" setting. • Checked: Disable the "Error action flag" setting.	• Not checked • Checked (Default: Not checked)
Initialize slave when failing to respond	Checks this box to resend the parameters from the DP-Master to the DP-Slave upon recovery of the DP-Slave from a communication error. • Not checked: Not resend the parameters to the DP-Slave. • Checked: Resend the parameters to the DP-Slave.	• Not checked • Checked (Default: Not checked)
Swap I/O Bytes in Master	Checks this box to swap the I/O data of the DP-Slave in the buffer memory of the RJ71PB91V. (☞ Page 37 Data Swap Function) • Not checked: Not swap the I/O data. • Checked: Swap the I/O data.	• Not checked • Checked (Default: Not checked)

Slave Modules

Set the configuration of the module mounted on the DP-Slave.

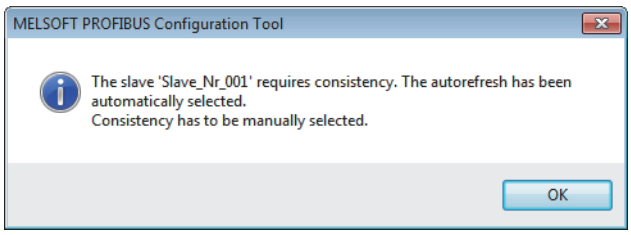
[Slave Settings] ⇨ [Next]



Item	Description
Modules installed	Displays the number of modules added to "Project Slave Modules".
are possible	Displays the maximum number of modules that can be added to "Project Slave Modules".
Max. Data size	Displays the maximum data capacity of the DP-Slave (in bytes).
I/O usage	Displays the total number of I/O points of modules added to "Project Slave Modules" (in bytes). The number of input points is displayed on the left, and the number of output points is displayed on the right.
Max. I/O sizes	Displays the maximum number of I/O points of the DP-Slave (in bytes). The number of input points is displayed on the left, and the number of output points is displayed on the right.
Slave User Parameters	Switches display/hide for "User_Prm_Data usage" and "Max. User_Prm_Data size" by clicking [+/-] button.
User_Prm_Data usage	Displays the buffer memory occupying size for the user parameter of the DP-Slave in bytes.
Max. User_Prm_Data size	Displays the maximum value for the user parameter of the DP-Slave.
Available Slave Modules	Displays the list of modules that can be added. When the module is not described in the GSD file, "Universal" is displayed. In this case, refer to the following. ☞ Page 117 Universal modules
Project Slave Modules	Lists the slot numbers and the module names of the added modules. When the module is not described in the GSD file, "Universal" is displayed. In this case, refer to the following. ☞ Page 117 Universal modules

Point

If the following window is displayed when the settings are completed, set "Data consistency" in the module parameters to "Enable (Use Autorefresh)". If not, the I/O data may be separated. (☞ Page 39 Data Consistency Function)



The methods to change the module configuration are listed below.

Item	Description
To add a module to the DP-Slave	Perform any of the following operations. • Drag and drop the module to be added to the DP-Slave from "Available Slave Modules" to "Project Slave Modules". • Double-click the module to be added in "Available Slave Modules". • Right-click the module to be added in "Available Slave Modules", and select [Add Module to Slave].
To delete a module from the DP-Slave	Perform any of the following operations. • Select the module to be deleted in "Project Slave Modules", and click the [×] button. • Select the module to be deleted in "Project Slave Modules", and press the [Delete] key on the keyboard.
To change the configuration order of the module	Perform any of the following operations. • Drag and drop the module of which configuration order is changed in "Project Slave Modules". • In "Project Slave Modules", select the module of which configuration order is changed, and click the [↓] button or the [↑] button.

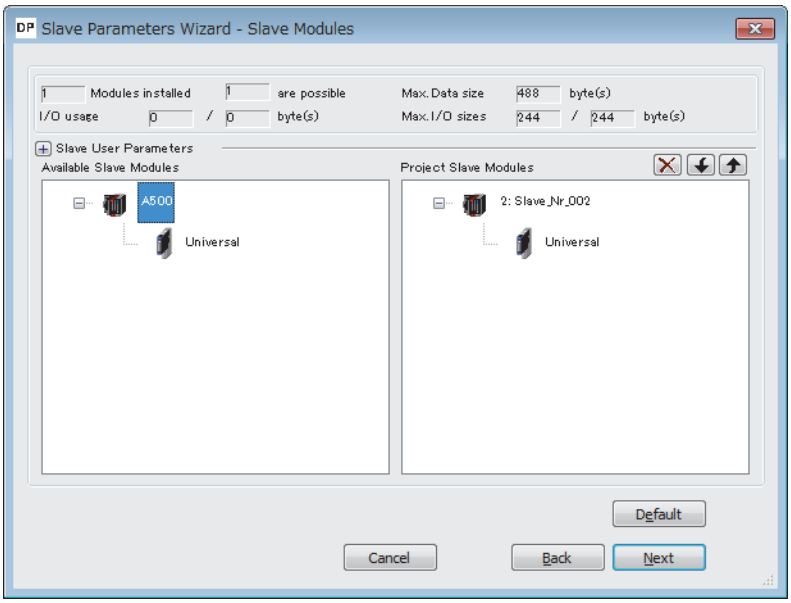
Point

Adding or deleting a module changes the buffer memory address of the I/O data of the master module.

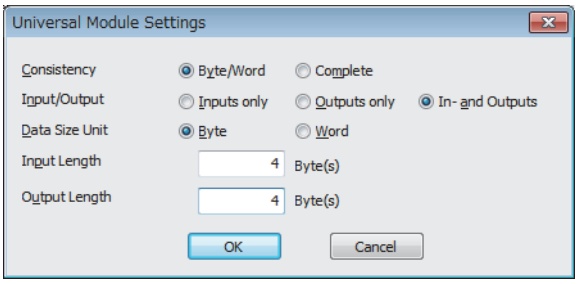
- When the parameter is changed, review the program and the refresh settings. (☞ Page 110 CPU Device Access)
- If the refresh settings are enabled, update the PROFIBUS labels again. (☞ Page 86 Update PROFIBUS Label)

■Universal modules

When the module is not described in the GSD file, the module name is displayed as "Universal".



The following items can be set when the module displayed as "Universal" is double-clicked in "Project Slave Modules".



Item	Description	Setting range
Consistency	Selects the I/O data unit used for the data consistency function. The data consistency function can be enabled in the "Master Settings" window. For the "Master Settings" window, refer to the following. ☞ Page 106 Master Settings • Byte/Word: The data consistency is maintained in bytes or words. • Complete: The data consistency of the entire I/O data of this module is maintained.	—
Input/Output	Selects the I/O data type handled by the module. • Inputs only: Handles input data. • Outputs only: Handles output data. • In- and Outputs: Handles input and output data.	—
Data Size Unit	Selects the I/O data unit that is set with "Input Length" or "Output Length".	—
Input Length	Sets the input data size. This item can be set when "Inputs only" or "In- and Outputs" is selected in "Input/Output".	0 to 16 (Unit varies depending on the "Data Size Unit" setting.)
Output Length	Sets the output data size. This item can be set when "Outputs only" or "In- and Outputs" is selected in "Input/Output".	0 to 16 (Unit varies depending on the "Data Size Unit" setting.)

Point

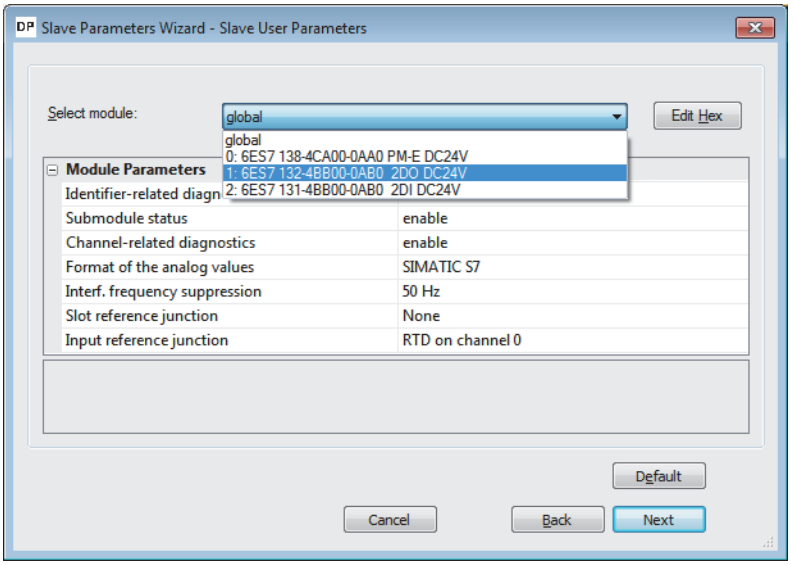
When the number of I/O points of the module displayed as "Universal" is set, check that the settings are made properly referring to the following. If the settings are incorrect, the module may not operate properly.

📖 Manual for the DP-Slave

Slave User Parameters

Set the user parameters of the DP-Slave.

[Slave Modules] ⇨ [Next]

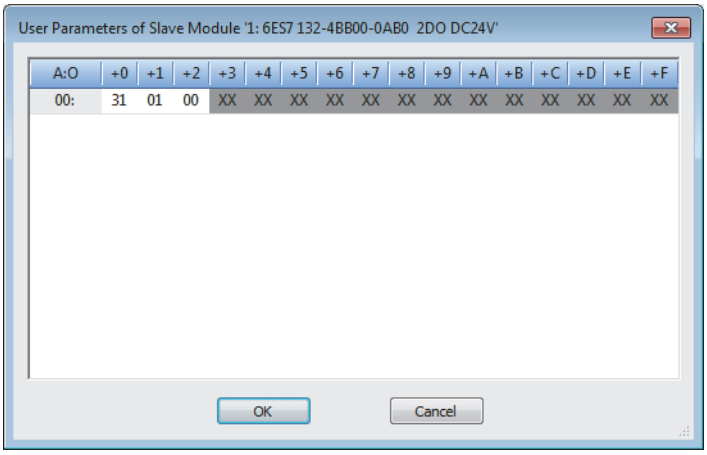


Item	Description
Select module	Selects the module of which user parameters are set.
[Edit Hex] button	By inputting numbers, directly edits the user parameters of the module selected for "Select module". (☞ Page 119 User Parameters of Slave Module)
Module Parameters	Sets the user parameters.

User Parameters of Slave Module

Directly edit the user parameters of the DP-Slave by inputting numbers.

[Slave User Parameters] ⇨ [Edit Hex] button



Point

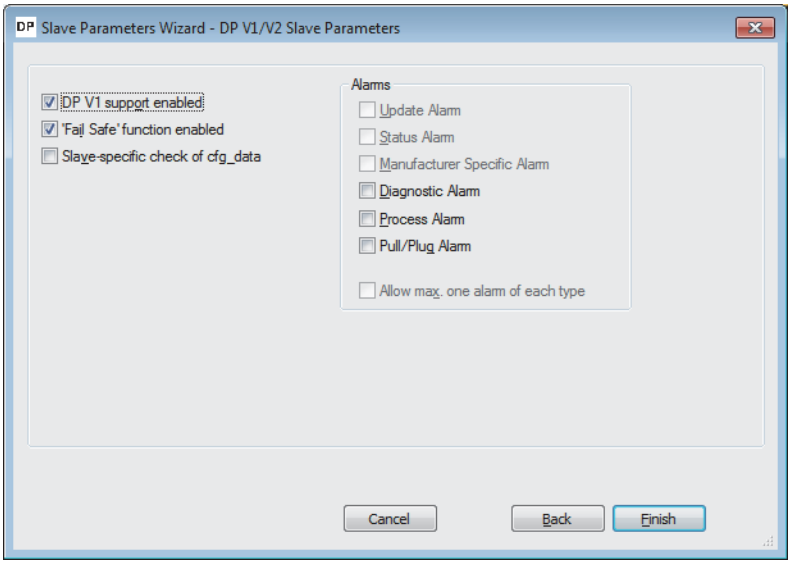
Note that knowledge about the user parameters is required for editing the user parameters in the "User Parameters of Slave Module" window.
Improper edit may not operate the module.
For details on the user parameter configuration, contact the manufacturer of the DP-Slave.

DP V1/V2 Slave Parameters

Set the slave parameters for the PROFIBUS-DPV1 and PROFIBUS-DPV2 functions.

[Slave User Parameters] ⇨ [Next]

The following window is displayed only when the PROFIBUS-DPV1 or PROFIBUS-DPV2 function is supported by the DP-Slave.



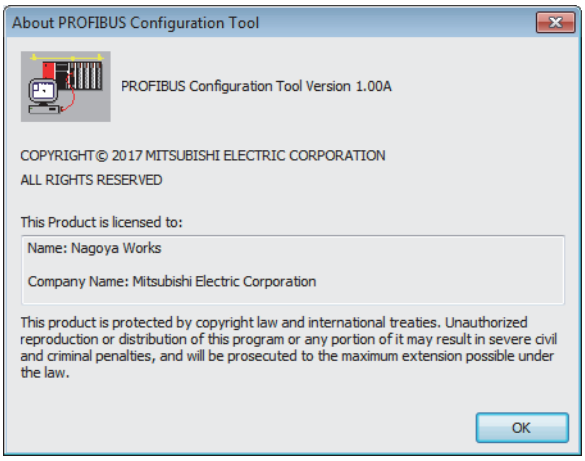
Item	Description
DP V1 support enabled	Check this box to use the PROFIBUS-DPV1 function. • Not checked: The PROFIBUS-DPV1 function is disabled. • Checked: The PROFIBUS-DPV1 function is enabled.
'Fail Safe' function enable	Check this box to turn the DP-Slave into the 'Fail Safe' state when the clear request is sent from the DP-Master. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. For the 'Fail Safe' state setting, refer to the following. 📖 Manual for the DP-Slave • Not checked: Not turn into the 'Fail Safe' state. • Checked: Turn into the 'Fail Safe' state.
Slave-specific check of cfg_data	Check this box when the parameter check method of the DP-Slave is different from that of the standard function of the PROFIBUS. This item can be set when the DP-Slave supports this function. For the parameter check method, refer to the following. 📖 Manual for the DP-Slave • Not checked: Perform the PROFIBUS standard parameter check. • Checked: Perform the parameter check specific to the DP-Slave.
Update Alarm	Check this box to allow Update Alarm to be sent. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. • Not checked: Prohibit sending of Update Alarm. • Checked: Allow sending of Update Alarm.
Status Alarm	Check this box to allow Status Alarm to be sent. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. • Not checked: Prohibit sending of Status Alarm. • Checked: Allow sending of Status Alarm.
Manufacturer Specific Alarm	Check this box to allow Manufacturer Specific Alarm to be sent. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. • Not checked: Prohibit sending of Manufacturer Specific Alarm. • Checked: Allow sending of Manufacturer Specific Alarm.
Diagnostic Alarm	Check this box to allow Diagnostic Alarm to be sent. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. • Not checked: Prohibit sending of Diagnostic Alarm. • Checked: Allow sending of Diagnostic Alarm.

Item	Description
Process Alarm	Check this box to allow Process Alarm to be sent. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. • Not checked: Prohibit sending of Process Alarm. • Checked: Allow sending of Process Alarm.
Pull/Plug Alarm	Check this box to allow Pull/Plug Alarm to be sent. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. • Not checked: Prohibit sending of Pull/Plug Alarm. • Checked: Allow sending of Pull/Plug Alarm.
Allow max. one alarm of each type	Check this box to acquire alarms of each type one by one when the DP-Slave detects multiple types of alarms. This item can be set when the DP-Slave supports this function. This item is fixed to "Checked" depending on the DP-Slave used. • Not checked: Acquire alarms in chronological order (maximum eight alarms). • Checked: Acquire alarms of each type one by one (maximum six alarms).

3.4 Checking the Software Version

The software version of PROFIBUS Configuration Tool can be checked in the following window of PROFIBUS Configuration Tool.

[Version] ⇨ [About PROFIBUS Configuration Tool]



4 PROGRAMMING

This chapter describes the programming for the PROFIBUS-DP network.

- Communication example of I/O data exchanges

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

- Program example of DP-Master

☞ Page 136 Program example for changing operation mode (self-diagnostics test)
☞ Page 138 Program example of the acquisition of diagnostic information
☞ Page 140 Program example of the acquisition of extended diagnostic information
☞ Page 143 Program example of the global control function
☞ Page 146 Program example of acyclic communication (acyclic communication)
☞ Page 149 Program example of the alarm acquisition function
☞ Page 152 Program example of the time control over DP-Slaves

Point

The acyclic communication function cannot execute with global control function or time control over DP-Slaves. When used in conjunction with these functions, configure an interlock circuit in the program.

- Program example of DP-Slaves

☞ Page 155 Program example for changing operation mode (self-diagnostics test)
☞ Page 158 Program example of notification request of extended diagnostic information
☞ Page 161 Program example for executing global control

- Program example of redundant system

☞ Page 162 Program Example of Redundant System

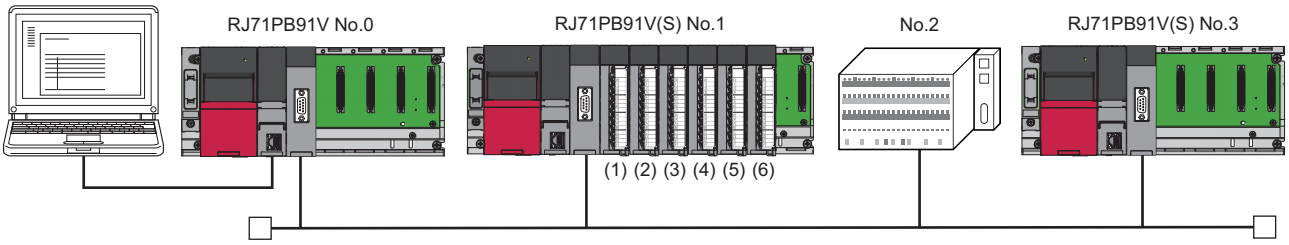
- Communication example when remote head module is mounted

☞ Page 279 Communication example

4.1 System Configuration Example

This section describes a program example for the PROFIBUS-DP network using the following system configuration.

System configuration



Numbers and station types	Module
No.0: DP-Master (FDL address 0)	• Power supply module: R61P • CPU module: R04CPU • RJ71PB91V (start I/O number: 0000H to 001FH)
No.1: DP-Slave (FDL address 1)	• Power supply module: R61P • CPU module: R04CPU • RJ71PB91V (start I/O number: 0000H to 001FH) • RX40C7 (start I/O number: 0020H to 002FH) • RY41NT2P (start I/O number: 0030H to 004FH) • RH42C4NT2P (start I/O number: 0050H to 006FH) • RY40NT5P (start I/O number: 0070H to 007FH) • RX40NC6B (start I/O number: 0080H to 009FH) • RY40NT5P (start I/O number: 00A0H to 00AFH)
No.2: DP-Slave (FDL address 2)	ET200S from Siemens K.K. (HighFeature(Cu))
No.3: DP-Slave (FDL address 3)	• Power supply module: R61P • CPU module: R04CPU • RJ71PB91V (start I/O number: 0000H to 001FH)

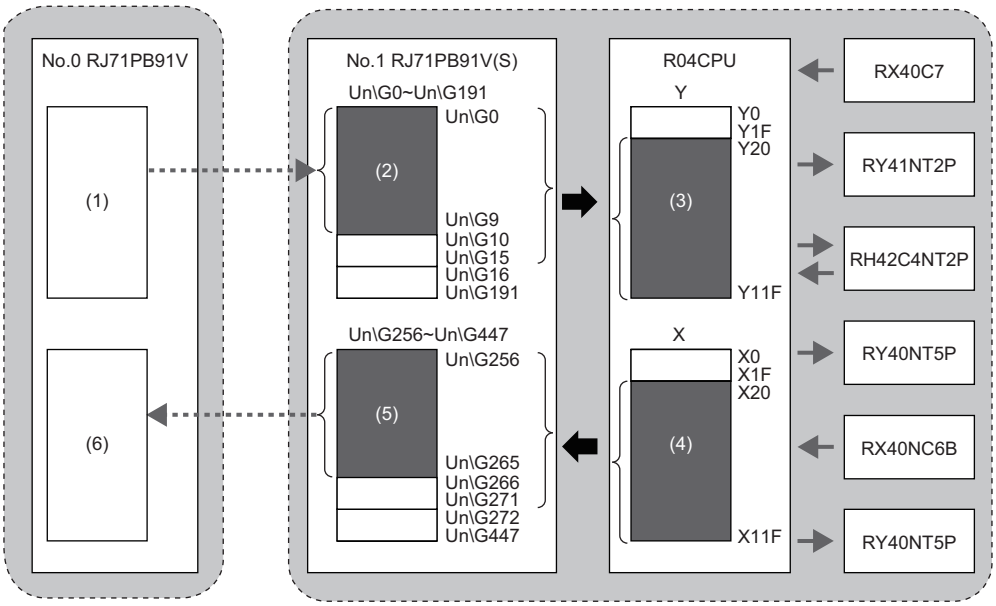
I/O data assignment

Assign I/O data of DP-Slave (FDL address 1) as follows.

No.	Name	I/O configuration information of slave parameters	Output receive area (Un\G0 to Un\G9)	Input send area (Un\G256 to Un\G265)
(1)	Input module	Data module 0: Input 1 word	—	1 word
(2)	Output module	Data module 1: Output 2 words	2 word	—
(3)	I/O module	Data module 2: I/O 2 words	2 word	2 word
(4)	Output module	Data module 3: Output 1 words	1 word	—
(5)	Input module	Data module 4: Input 2 word	—	2 word
(6)	Output module	Data module 5: Output 1 words	1 word	—
Data for acquiring information		Data module 6: I/O 1 words	1 word	1 word

Set the I/O configuration information of slave parameters on the DP-Master. (☞ Page 69 Slave parameter settings on DP-Master)

■I/O data assignment between DP-Master and DP-Slave (FDL address 1)



(1) Output data area (for mode 3) on the DP-Master. Output data is sent to (2) by the I/O data exchange function.
(2) Output receive area (Un\G0 to Un\G9) on the DP-Slave. Output data is written to (3) by the refresh function.
(3) Y device on the CPU module. Output data is sent to the output module or the I/O module.
(4) X device on the CPU module. Input data is received from the input module or the I/O module.
(5) Input send area (Un\G256 to Un\G265) on the DP-Slave. Input data is read from (4) by the refresh function.
(6) Input data area (for mode 3) on the DP-Master. Input data is received from (5) by the I/O data exchange function.

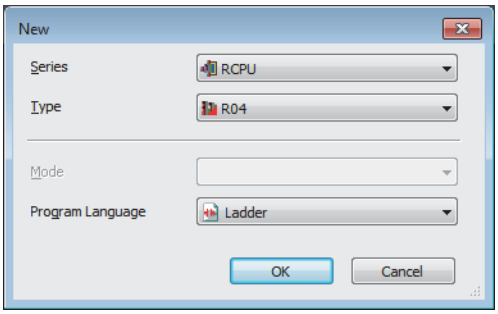
4.2 DP-Master Settings

Connect the engineering tool to the CPU module of the DP-Master, and set the parameters.

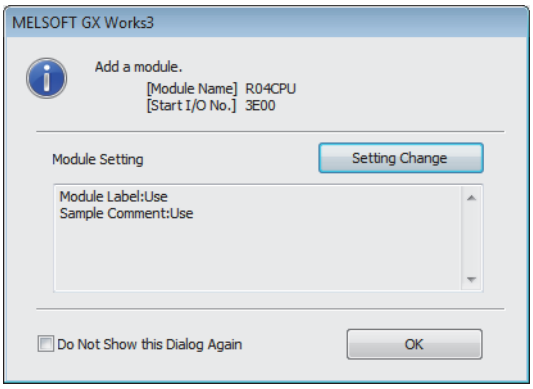
Creating a new project

1. Set the CPU module as follows.

[Project] ⇨ [New]



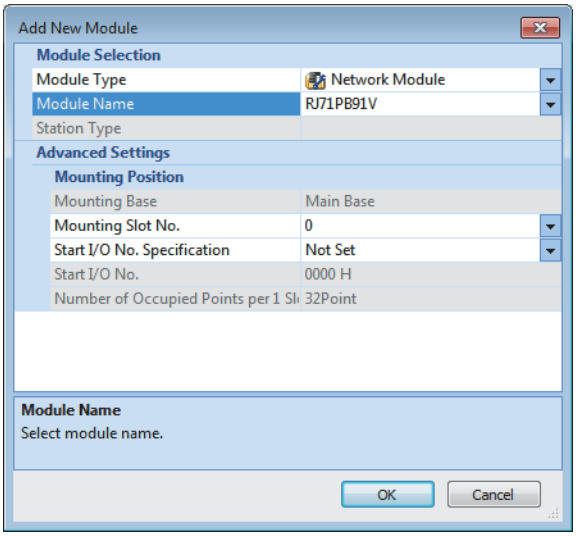
2. Click the [Setting Change] button and set the [Module Label] to [Use].



3. Click the [OK] button to add module labels of the CPU module.

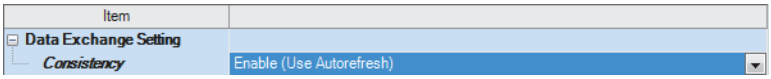
4. Set the RJ71PB91V as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]



5. To enable the data consistency function, set the items in "Basic Setting" as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Module Parameter] ⇨ [Basic Setting]



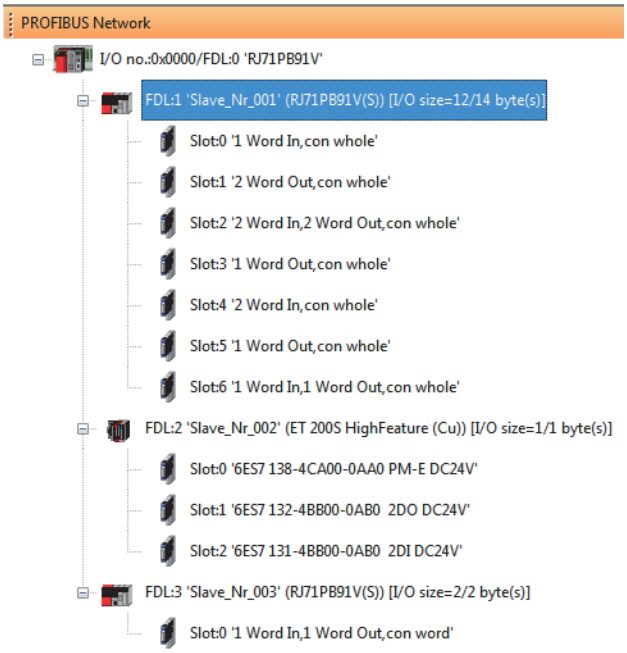
PROFIBUS module setting

1. Start PROFIBUS Configuration Tool from the engineering tool.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting]

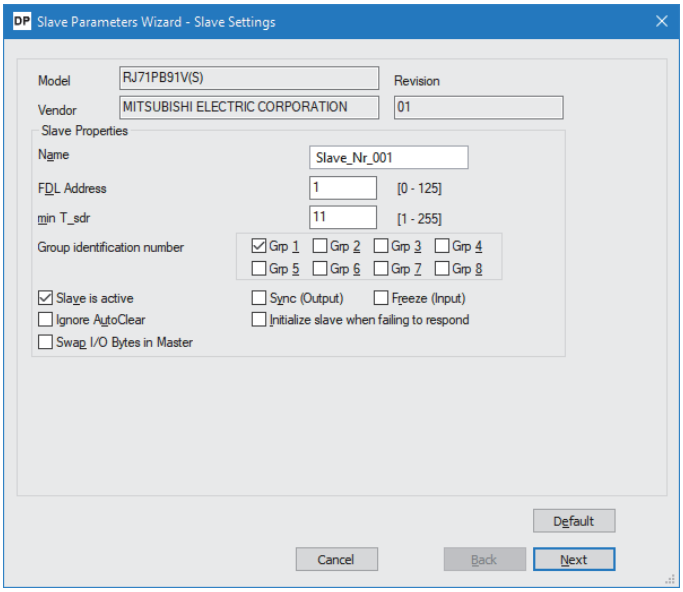
2. Add DP-Slaves to the project. When the DP-Slave to be added is not in [Global GSD Database] tab, add GSD file of DP-Slave to GSD database. (☞ Page 79 Add GSD File)

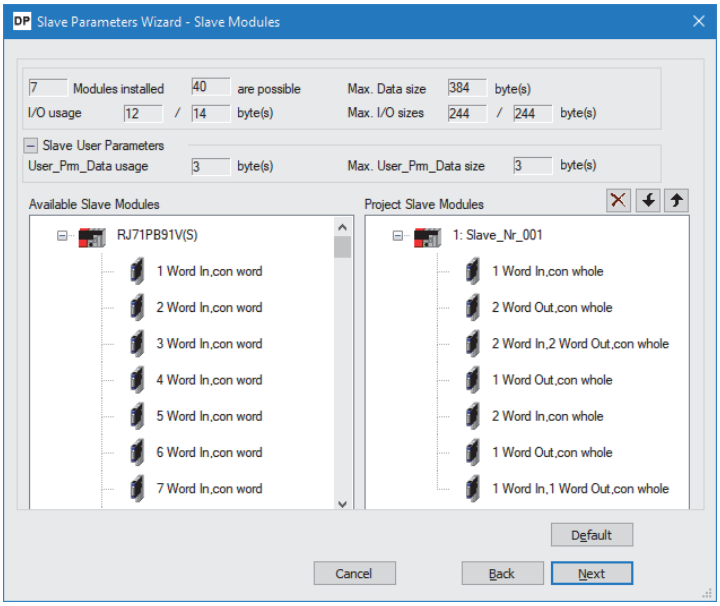
[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ [Global GSD Database] tab ⇨ Target DP-Slave ⇨ Right-click ⇨ [Add Slave to Project]

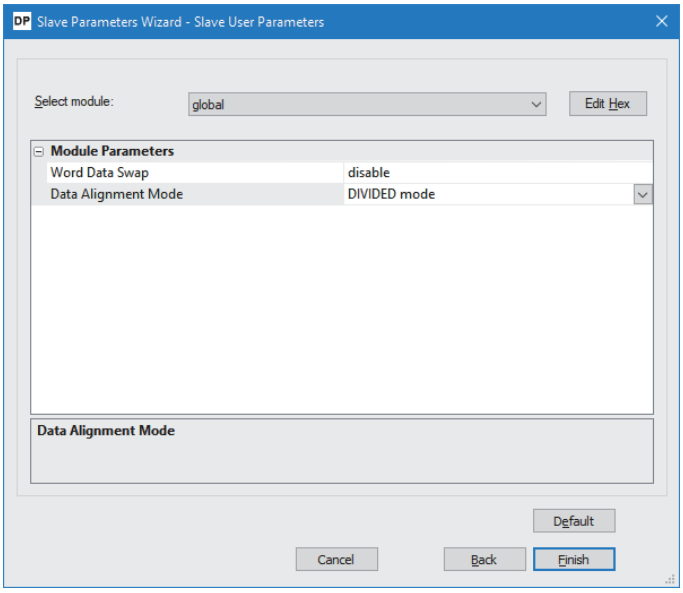


3. Set the items in the "Slave Settings" window as follows.

• DP-Slave (FDL address 1)

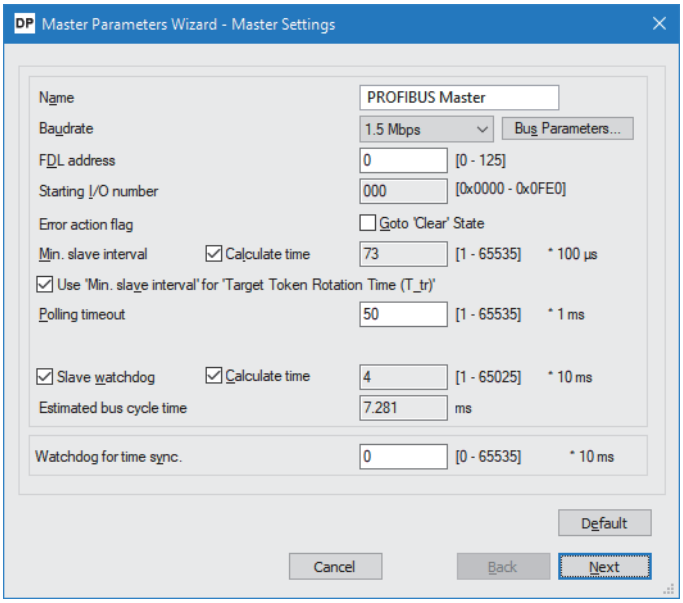




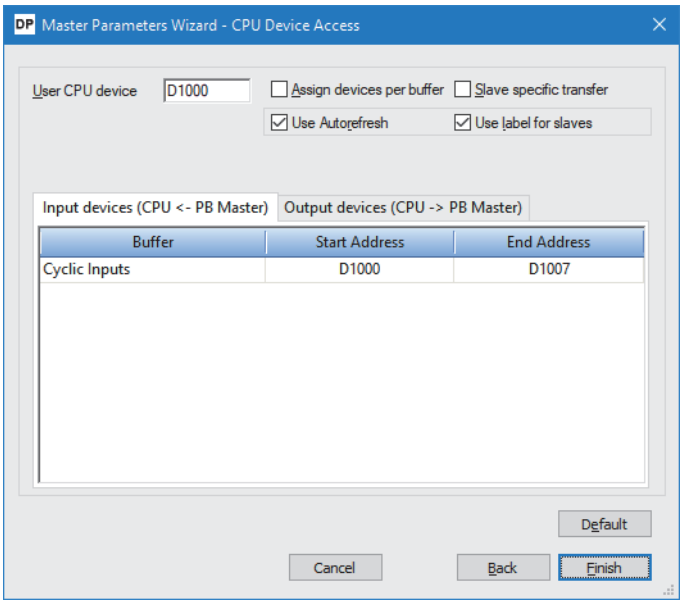


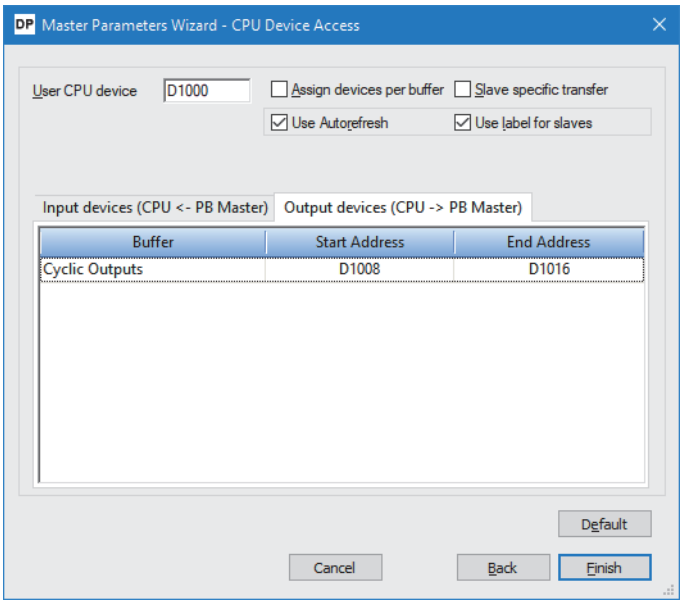
4. Set the items of "Master Settings" as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ [I/O no.:0x0/FDL:0 'RJ71PB91V'] ⇨ Right-click ⇨ [Master Settings]



5. Click the [Next] button in the "Master Settings" window, and set the items of "CPU Device Access" as follows.





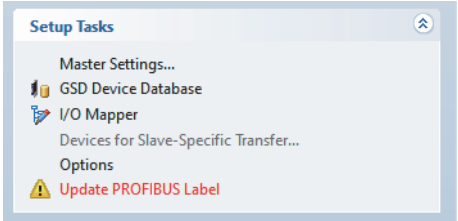
6. Click the [Finish] button to close the "Master Settings" window.

Update PROFIBUS Labels

This enables refresh settings and creates/updates structures to be used for the global labels and module function block.

1. Click "Update PROFIBUS Label" below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting]⇨[PROFIBUS Configurator Tasks]



2. Convert some program codes or all program codes.

[Convert] ⇨ [Convert] or [Rebuild All]

3. Write the set parameters to the CPU module or the SD memory card of the CPU module. Then, reset the CPU module or power off and on the system.

[Online] ⇨ [Write to PLC]

Point

In this example, default values were used for parameters that are not shown above. (☞ Page 61 PARAMETER SETTINGS)

4.3 DP-Slave Settings

Set for DP-Slaves that configure the PROFIBUS-DP network.

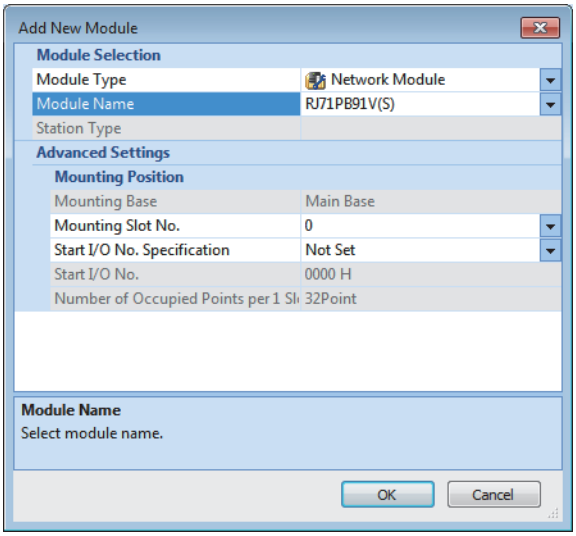
For the DP-Slave that uses the RJ71PB91V, connect the engineering tool to the CPU module, and set the parameters as follows. Configure the same settings to FDL address 1 and FDL address 3.

For the settings of the DP-Slave that uses other than the RJ71PB91V, refer to the manual of the module used.

Creating a new project

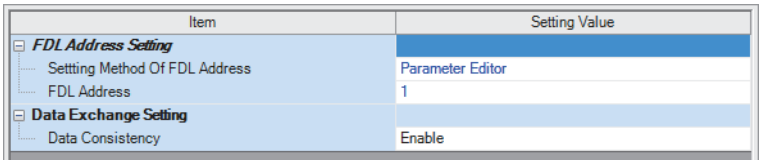
1. Set the CPU module, and add a module label of the CPU module. Procedures for setting the CPU module and adding a module label are the same as those for the DP-Master. (☞ Page 126 DP-Master Settings)
2. Set the RJ71PB91V(S) as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]



3. Set the items in "Basic Setting" as follows. To set FDL address 1, set "FDL address" to "1". To set FDL address 3, set "FDL address" to "3".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V(S)] ⇨ [Basic Setting]



4. Set the items in "Refresh Setting" as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V(S)] ⇨ [Refresh Setting]

Item	Setting Value
Transfer to intelligent module	Transfers the data of the specified device to the buffer memory.
Input Send Area	Refresh setting of Input send area
0th to 15th words	X20
16th to 31th words	
32th to 47th words	
48th to 63th words	
64th to 79th words	
80th to 95th words	
96th to 111th words	
112th to 127th words	
128th to 143th words	
144th to 159th words	
160th to 175th words	
176th to 191th words	
Transfer to CPU	Transfer the buffer memory data to the specified device.
Output Receive Area	Refresh setting of Output receive area
0th to 15th words	Y20
16th to 31th words	
32th to 47th words	
48th to 63th words	
64th to 79th words	
80th to 95th words	
96th to 111th words	
112th to 127th words	
128th to 143th words	
144th to 159th words	
160th to 175th words	
176th to 191th words	
Refresh Timing	Set refresh timing.
Refresh Timing	At the Execution Time of END Instruction
Refresh Group [n](n: 1-64)	1
Refresh Timing (I/O)	Specify the timing which transfers the I/O device data.
Refresh Timing	Based on Refresh Timing (Buffer Memory)

5. Write the set parameters to the CPU module or the SD memory card of the CPU module. Then, reset the CPU module or power off and on the system.

[Online] ⇨ [Write to PLC]

Point

In this example, default values were used for parameters that are not shown above. For the parameters, refer to the following.

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

4.4 Checking the Network Status

Communications are being performed properly if the LEDs on the DP-Master and bits corresponding to the buffer memory areas on the DP-Master are in the following state after execution of the program.

• LED on the RJ71PB91V

LED	Status
RUN_LED	On
ERR_LED	Off
BF_LED	Off

• Bit corresponding to buffer memory area

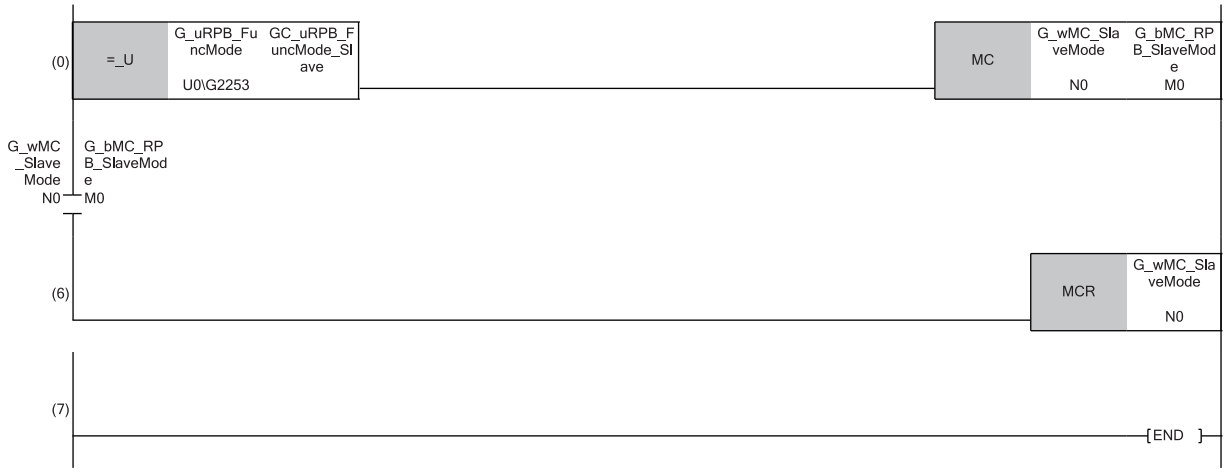
Name	Status
'Slave status area (Normal communication detection)' (Un\G23040.0 to Un\G23040.2)	On
'Slave status area (Diagnostic information detection)' (Un\G23057.0 to Un\G23057.2)	Off

4.5 Interlock of Function Mode (Station Type)

Assignment of I/O signals and buffer memory areas varies depending on whether the RJ71PB91V is used as DP-Master or DP Slave. Therefore, if the program does not support the station type used, it may behave in an unexpected way. Especially when the module label is not used, configure the interlock circuit of the function mode for safety reasons.
The following program example shows an interlock circuit that executes the program only when the function mode of the RJ71PB91V is the PROFIBUS-DP slave mode.

Classification	Description
Module label	This program example does not use the module label because the interlock circuit performs an important role in cases where the module label is not used.
Label to be defined	Define global labels as shown below:

	Label Name	Data Type		Class	Assign (Device/Label)	Constant
1	G_uRPB_FuncMode	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	U0\G2253	
2	GC_uRPB_FuncMode_Slave	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL_CONSTANT		H1001
3	G_wMC_SlaveMode	Word [Signed]	...	VAR_GLOBAL	N0	
4	G_bMC_RPB_SlaveMode	Bit	...	VAR_GLOBAL	M0	



Provide an interlock for the entire program for DP-Slave using the master control instructions (MC and MCR).

■Processing before starting the program

(0) Start the master control when the value stored in 'Function mode display area' (Un\G2253) is the function mode number of PROFIBUS-DP (slave) (1001H). (In this step, turn on RJ71PB91V (slave) function mode match (M0) using Master control section (for slave) (N0).)

■Processing after exiting the program

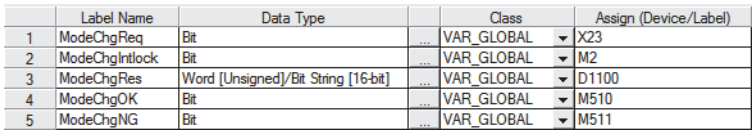
(6) Exit the master control after exiting the program for slave. (In this step, use Master control section (for slave) (N0).)

4.6 Program Example of DP-Master

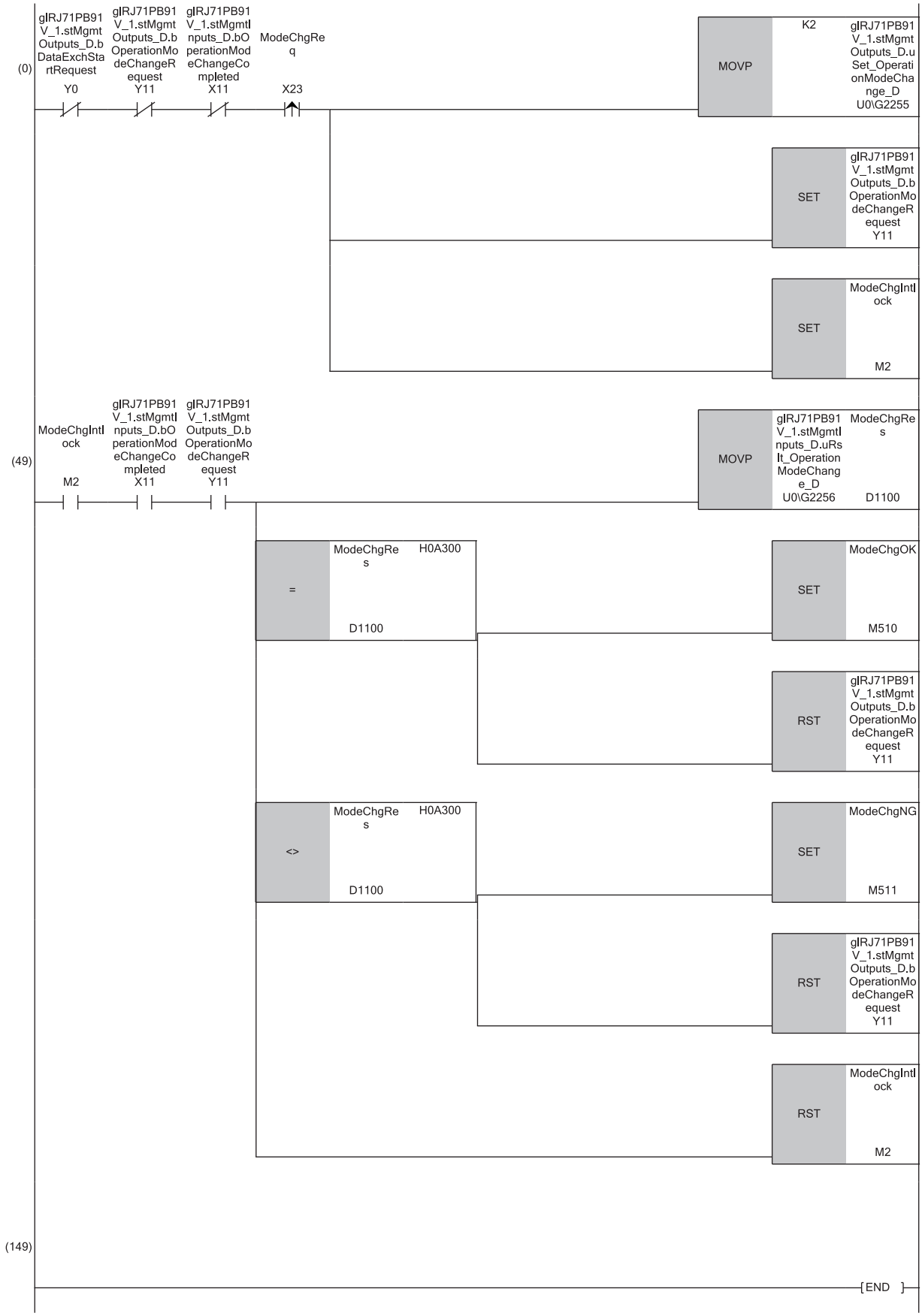
Program example for changing operation mode (self-diagnostics test)

The following example shows a program to change the operation mode to the self-diagnostic mode (mode 2) and execute the self-diagnostics test without performing communications.

This program example does not use DP-Slave. (☞ Page 124 System configuration)

Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtInputs_D.bOperationModeChangeCompleted	Operation mode change completed signal	X11
	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y0
	glRJ71PB91V_1.stMgmtOutputs_D.bOperationModeChangeRequest	Operation mode change request signal	Y11
	glRJ71PB91V_1.stMgmtOutputs_D.uSet_OperationModeChange_D	Operation mode change request area	U0\G2255
	glRJ71PB91V_1.stMgmtInputs_D.uRslt_OperationModeChange_D	Operation mode change result area	U0\G2256
Label to be defined	Define global labels as shown below: 		

	Label Name	Data Type		Class	Assign (Device/Label)
1	ModeChgReq	Bit	...	VAR_GLOBAL	X23
2	ModeChgIntlock	Bit	...	VAR_GLOBAL	M2
3	ModeChgRes	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D1100
4	ModeChgOK	Bit	...	VAR_GLOBAL	M510
5	ModeChgNG	Bit	...	VAR_GLOBAL	M511



(0) Set 'Operation mode change request area' (Un\G2255) to (Self-diagnostic mode) and turn on 'Operation mode change request signal' (Y11) and M2 (For operation mode change interlock).

(49)The change results are read from 'Operation mode change result area'(Un\G2256). If the read results are normal, the successful completion process is performed and 'Operation mode change request signal' (Y11) is turned off. If the read results are abnormal, the 'completed with an error' process is performed and 'Operation mode change request signal' (Y11) is turned off. Finally, M2 (For operation mode change interlock) turns off.

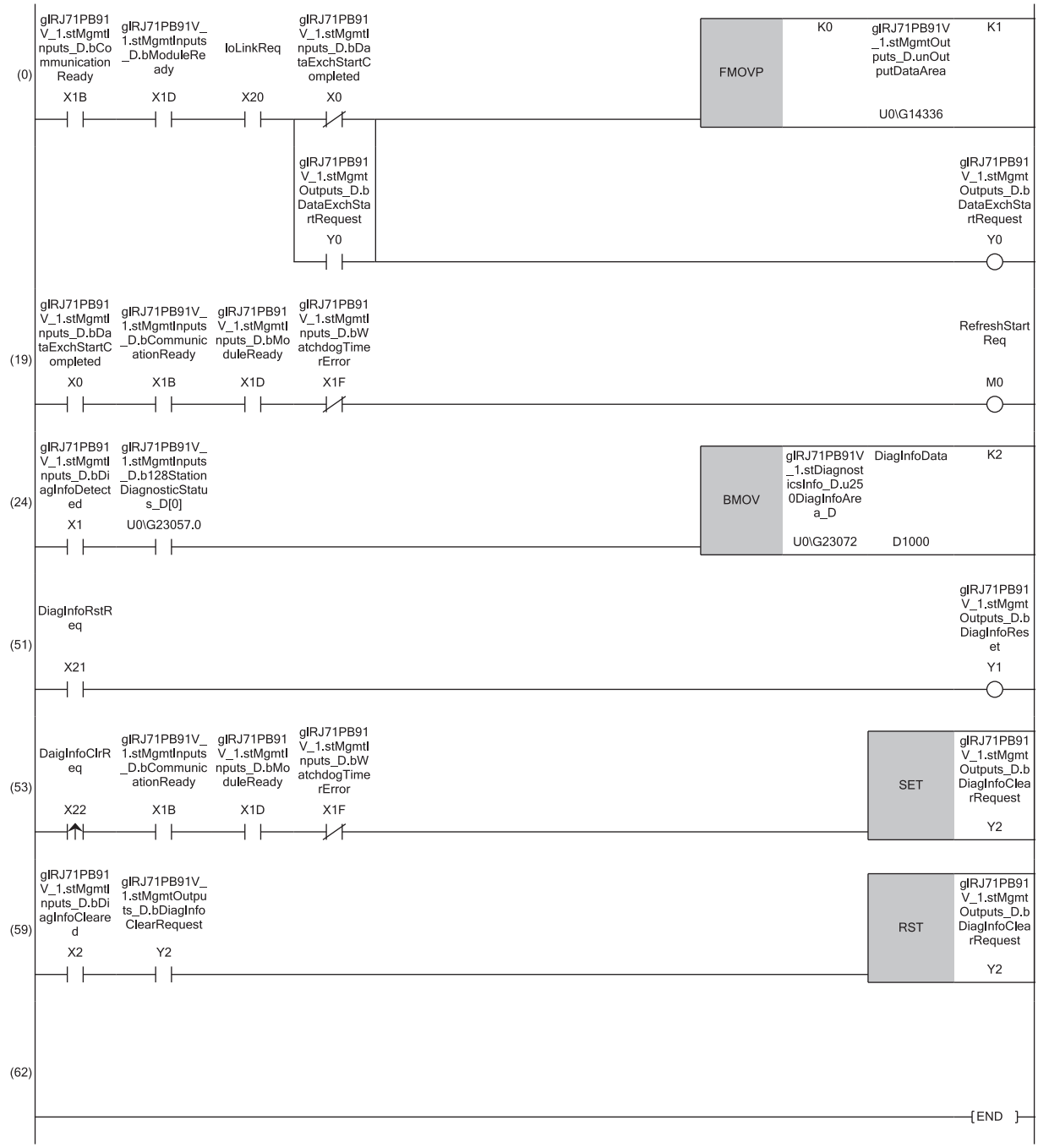
Program example of the acquisition of diagnostic information

This function enables acquisition of diagnostic information generated at DP-Slaves during I/O data exchanges by using the buffer memory and I/O signals.

This program example does not use DP-Slaves (FDL address 2 and FDL address 3). (☞ Page 124 System configuration)

Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted	Data exchange start completed signal	X0
	glRJ71PB91V_1.stMgmtInputs_D.bDiagInfoDetected	Diagnostic information detection signal	X1
	glRJ71PB91V_1.stMgmtInputs_D.bDiagInfoCleared	Diagnostic information area cleared signal	X2
	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady	Communication READY signal	X1B
	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady	Module ready signal	X1D
	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError	Module watchdog timer error signal	X1F
	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y0
	glRJ71PB91V_1.stMgmtOutputs_D.bDiagInfoReset	Diagnostic information detection reset request signal	Y1
	glRJ71PB91V_1.stMgmtOutputs_D.bDiagInfoClearRequest	Diagnostic information area clear request signal	Y2
	glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea	Output data area (for mode 3)	U0\G14336
	glRJ71PB91V_1.stMgmtInputs_D.b128StationDiagnosticStatus_D[0]	Slave status area (Diagnostic information detection): 1st station	U0\G23057.0
	glRJ71PB91V_1.stDiagnosticsInfo_D.u250DiagInfoArea_D	Diagnostic information area (for mode 3)	U0\G23072
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)
1	IoLinkReq	Bit	...	VAR_GLOBAL	X20
2	DiagInfoRstReq	Bit	...	VAR_GLOBAL	X21
3	DaigInfoClrReq	Bit	...	VAR_GLOBAL	X22
4	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
5	DiagInfoData	Word [Unsigned]/Bit String [16-bit](0..1)	...	VAR_GLOBAL	D1000



(24)Acquire diagnostic information for the 1st station.
(51)Turn on 'Diagnostic information detection reset request signal' (Y1).
(53)Turn on 'Diagnostic information area clear request signal' (Y2).
(59)Turn off 'Diagnostic information area clear request signal' (Y2).

Program example of the acquisition of extended diagnostic information

This function enables acquisition of extended diagnostic information generated at DP-Slaves during I/O data exchanges by using the buffer memory and I/O signals.

This program example does not use DP-Slaves (FDL address 2 and FDL address 3). (☞ Page 124 System configuration)

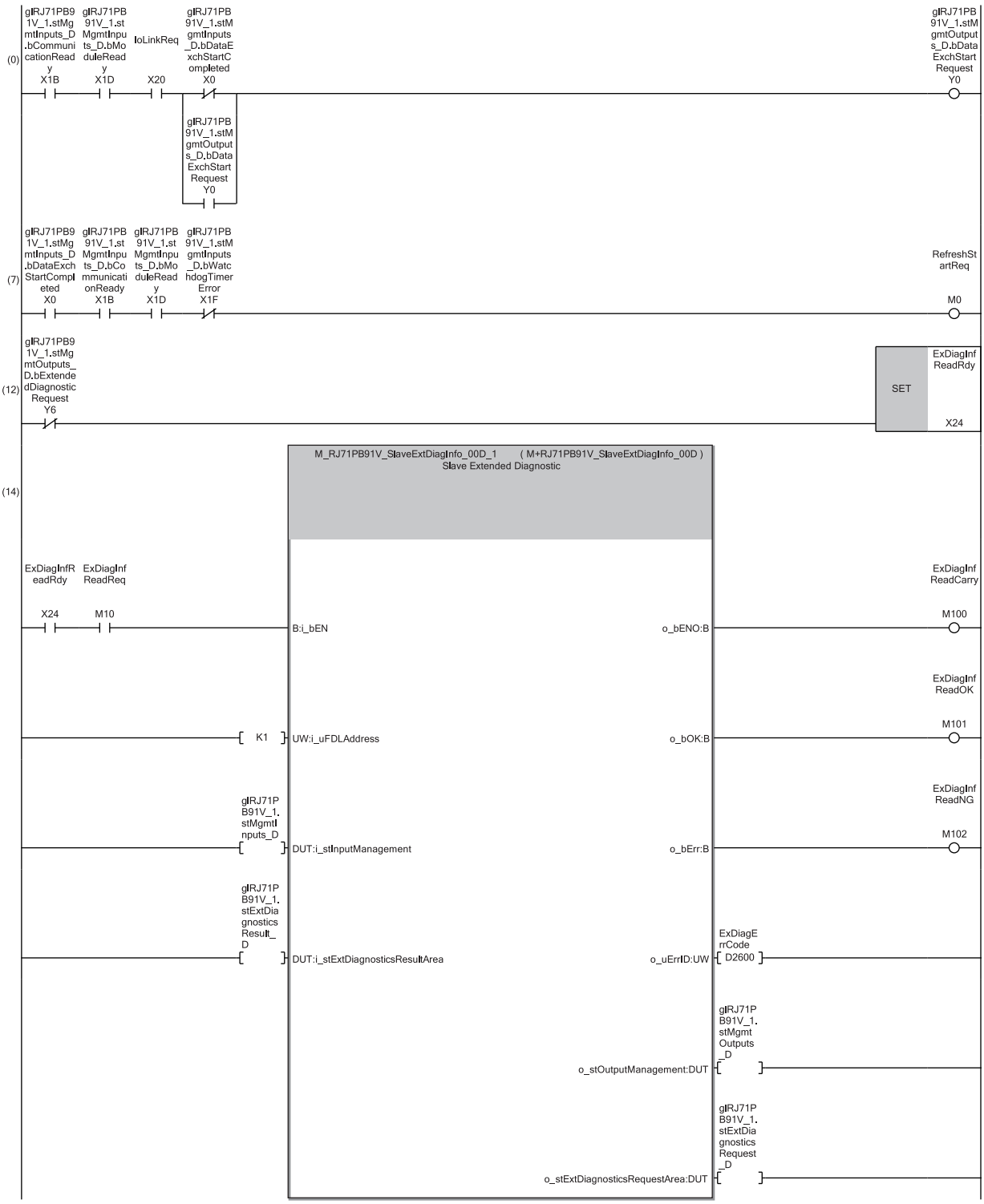
Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted	Data exchange start completed signal	X0
	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady	Communication READY signal	X1B
	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady	Module ready signal	X1D
	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError	Module watchdog timer error signal	X1F
	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y0
	glRJ71PB91V_1.stMgmtOutputs_D.bExtendedDiagnosticRequest	Extended diagnostic information read request signal	Y6
	glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea	Output data area (for mode 3)	U0\G14336
	glRJ71PB91V_1.stMgmtInputs_D	PROFIBUS input management area	—
	glRJ71PB91V_1.stExtDiagnosticsResult_D	Extended diagnostic information response area	—
	glRJ71PB91V_1.stMgmtOutputs_D	PROFIBUS output management area	—
	glRJ71PB91V_1.stExtDiagnosticsRequest_D	Extended diagnostic information request area	—
Label to be defined	Define global labels as shown below:		

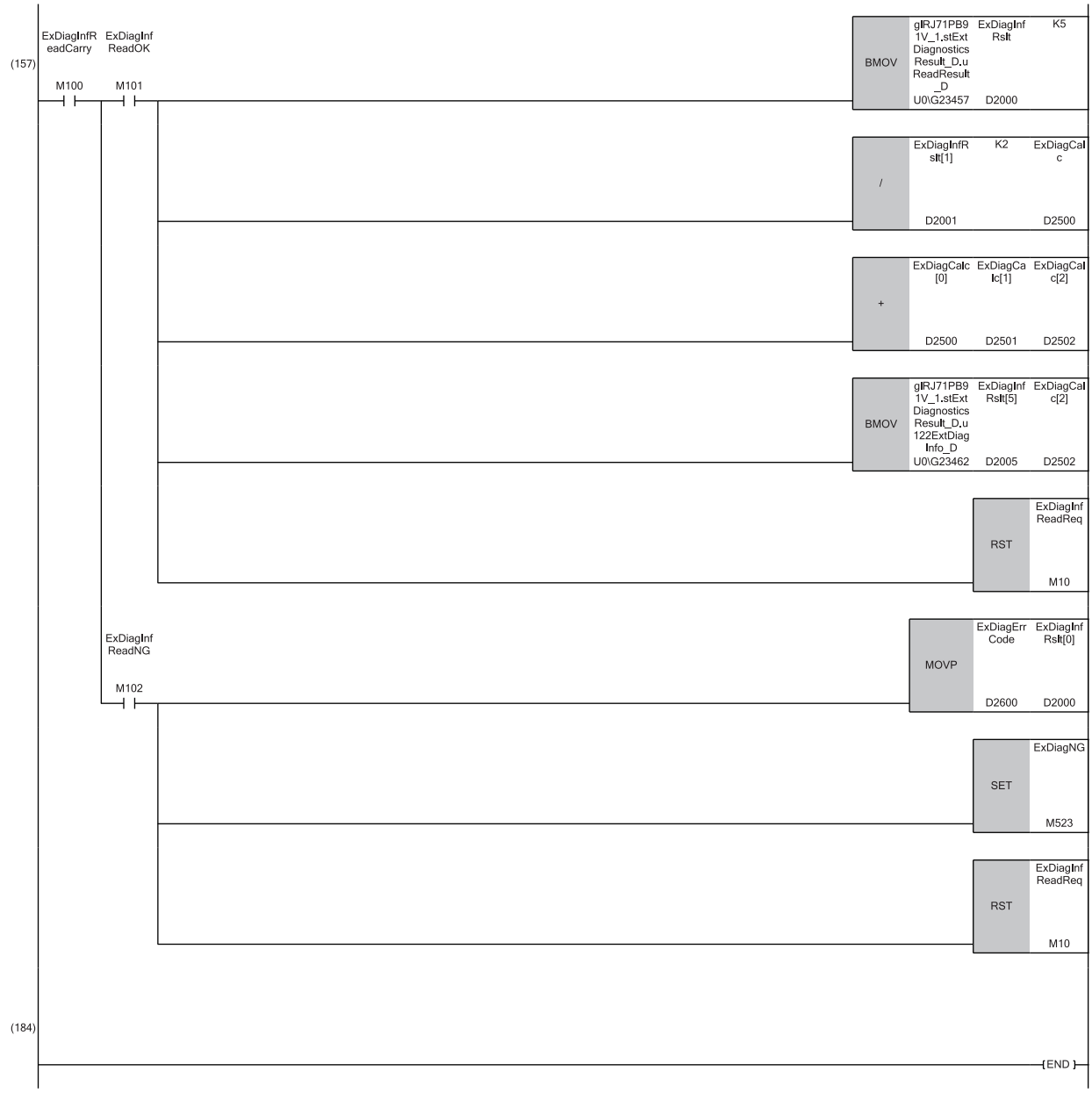
	Label Name	Data Type		Class	Assign (Device/Label)
1	ExDiagInfReadRdy	Bit	...	VAR_GLOBAL	X24
2	ExDiagInfReadReq	Bit	...	VAR_GLOBAL	M10
3	ExDiagInfReadCarry	Bit	...	VAR_GLOBAL	M100
4	ExDiagInfReadOK	Bit	...	VAR_GLOBAL	M101
5	ExDiagInfReadNG	Bit	...	VAR_GLOBAL	M102
6	ExDiagErrCode	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2600
7	ExDiagInfRslt	Word [Unsigned]/Bit String [16-bit](0..126)	...	VAR_GLOBAL	D2000
8	ExDiagCalc	Word [Signed](0..2)	...	VAR_GLOBAL	D2500
9	IoLinkReq	Bit	...	VAR_GLOBAL	X20
10	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
11	ExDiagNG	Bit	...	VAR_GLOBAL	M523

■FBs

The following shows FBs to be used in the program example.

• M_RJ71PB91V_SlaveExtDiagInfo


(0)
glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady X1B
glRJ71PB91V_1.stMgmtInputs_D.bModuleReady X1D
IoLinkReq X20
glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted X0
glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest Y0
glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest Y0
(7)
glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted X0
glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady X1B
glRJ71PB91V_1.stMgmtInputs_D.bModuleReady X1D
glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError X1F
RefreshStartReq M0
(12)
glRJ71PB91V_1.stMgmtOutputs_D.bExtendedDiagnosticRequest Y6
SET ExDiagInfReadRdy X24
(14)
M_RJ71PB91V_SlaveExtDiagInfo_00D_1 (M+RJ71PB91V_SlaveExtDiagInfo_00D)
Slave Extended Diagnostic
ExDiagInfReadRdy X24
ExDiagInfReadReq M10
B:i_bEN
o_bENO:B
ExDiagInfReadCarry M100
K1
UW:i_uFDLAddress
o_bOK:B
ExDiagInfReadOK M101
glRJ71PB91V_1.stMgmtInputs_D
DUT:i_stInputManagement
o_bErr:B
ExDiagInfReadNG M102
glRJ71PB91V_1.stExtDiagnosticsResult_D
DUT:i_stExtDiagnosticsResultArea
o_uErrID:UW
ExDiagErrCode D2600
glRJ71PB91V_1.stMgmtOutputs_D
o_stOutputManagement:DUT
glRJ71PB91V_1.stExtDiagnosticsRequest_D
o_stExtDiagnosticsRequestArea:DUT



■Starting communications

(0) Set 'Output data area (for mode 3)' (U0\G14336) and turn on 'Data exchange start request signal' (Y0).

(7) Turn on Refresh start request (M0).

■Reading extended diagnostic information

(12)Turn on X24 (Extended diagnostic information read ready completion).

(14)Execute M+RJ71PB91V_SlaveExtDiagInfo function block.

Set the following as input arguments.

- FDL address: 1
- PROFIBUS input management area: glRJ71PB91V_1.stMgmtInputs_D
- Extended diagnostic information response area: glRJ71PB91V_1.stExtDiagnosticsResult_D

Set the following as output arguments.

- Execution status: M100
- Completed successfully: M101
- Completed with an error: M102
- Error ID: D2500
- PROFIBUS output management area: glRJ71PB91V_1.stMgmtOutputs_D
- Extended diagnostic information request area: glRJ71PB91V_1.stExtDiagnosticsRequest_D

(157)Acquire extended diagnostic information and turn off M10 (Extended diagnostic information read FB execution command).

Acquire error ID, perform 'completed with an error' process and turn off M10 (Extended diagnostic information read FB execution command).

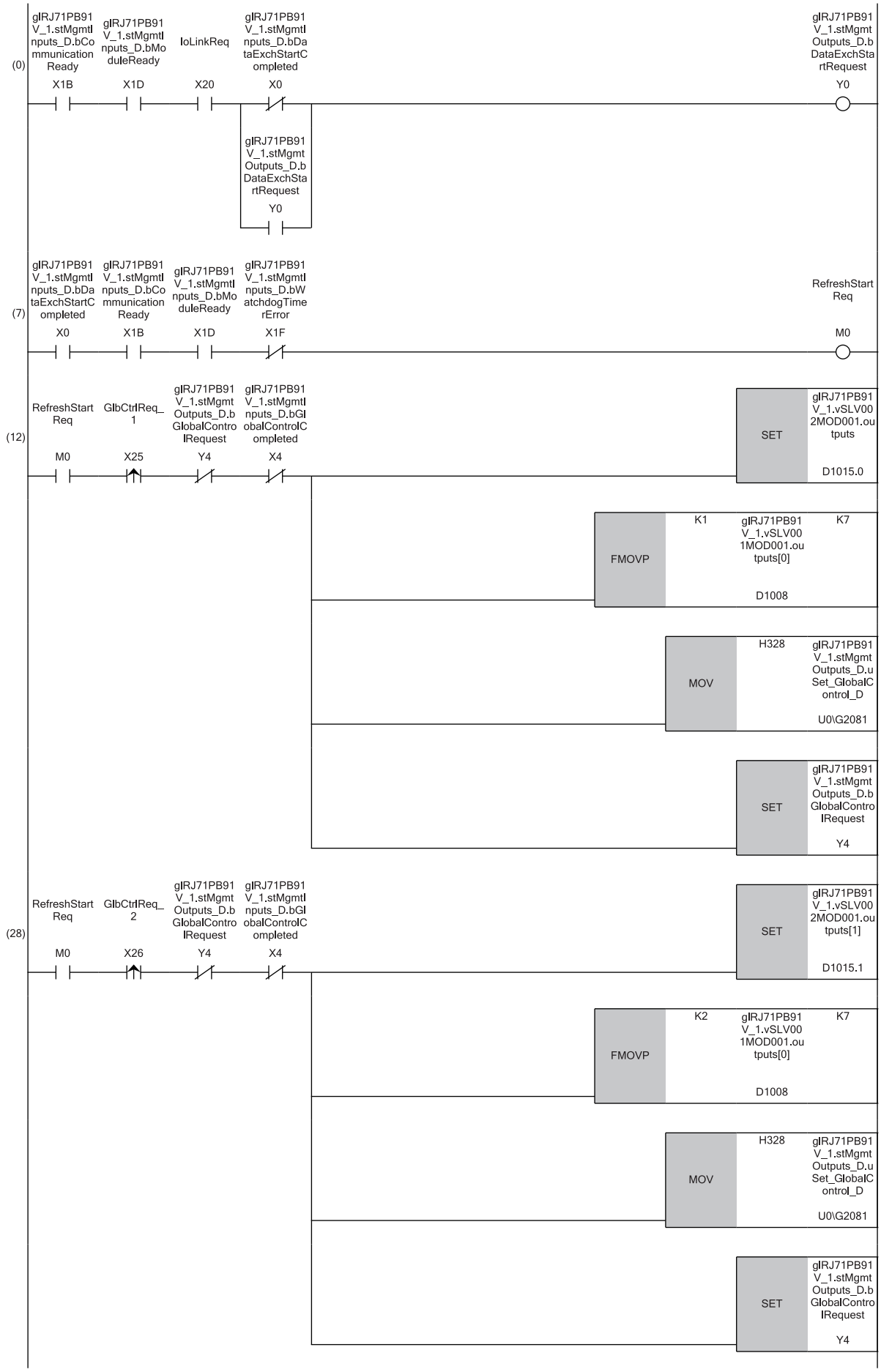
Program example of the global control function

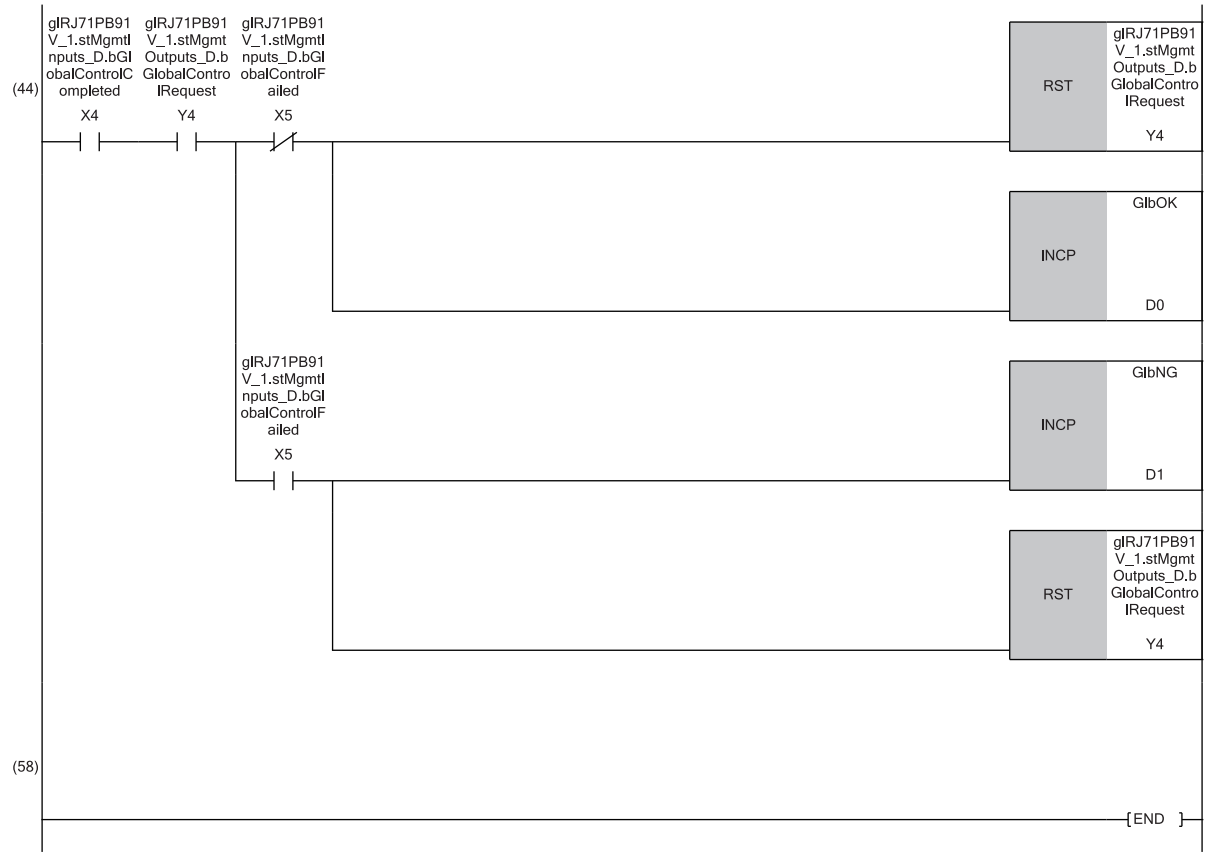
The following example shows a program to synchronously control I/O data of DP-Slaves for each specified group over multicast (simultaneous broadcast) from the DP-Master.

In this program example, DP-Slave (FDL address 1) is set in group 1 and DP-Slave (FDL address 2) is set in group 2. (☞ Page 124 System configuration)

Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted	Data exchange start completed signal	X0
	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady	Communication READY signal	X1B
	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady	Module ready signal	X1D
	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError	Module watchdog timer error signal	X1F
	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y0
	glRJ71PB91V_1.stMgmtOutputs_D.bGlobalControlRequest	Global control request signal	Y4
	glRJ71PB91V_1.stMgmtInputs_D.bGlobalControlCompleted	Global control completed signal	X4
	glRJ71PB91V_1.stMgmtInputs_D.bGlobalControlFailed	Global control failed signal	X5
	glRJ71PB91V_1.stMgmtOutputs_D.uSet_GlobalControl_D	Global control area	U0\G2081
	glRJ71PB91V_1.vSLV002MOD001.outputs	ET200S output data	D1014.0
	glRJ71PB91V_1.vSLV002MOD001.outputs[1]	ET200S output data	D1014.1
	glRJ71PB91V_1.vSLV001MOD001.outputs[0]	91V output data (Slot 1 output)	D1007
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)
1	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
2	IoLinkReq	Bit	...	VAR_GLOBAL	X20
3	GlbCtrlReq_1	Bit	...	VAR_GLOBAL	X25
4	GlbCtrlReq_2	Bit	...	VAR_GLOBAL	X26
5	GlbOK	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D0
6	GlbNG	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D1


(0)
gIRJ71PB91 V_1.stMgmtInputs_D.bCommunicationReady
X1B
gIRJ71PB91 V_1.stMgmtInputs_D.bModuleReady
X1D
IoLinkReq
X20
gIRJ71PB91 V_1.stMgmtInputs_D.bDataExchStartCompleted
X0
gIRJ71PB91 V_1.stMgmtOutputs_D.bDataExchStartRequest
Y0
gIRJ71PB91 V_1.stMgmtOutputs_D.bDataExchStartRequest
Y0
(7)
gIRJ71PB91 V_1.stMgmtInputs_D.bDataExchStartCompleted
X0
gIRJ71PB91 V_1.stMgmtInputs_D.bCommunicationReady
X1B
gIRJ71PB91 V_1.stMgmtInputs_D.bModuleReady
X1D
gIRJ71PB91 V_1.stMgmtInputs_D.bWatchdogTimerError
X1F
RefreshStartReq
M0
(12)
RefreshStartReq
M0
GlbCtrlReq_1
X25
gIRJ71PB91 V_1.stMgmtOutputs_D.bGlobalControlRequest
Y4
gIRJ71PB91 V_1.stMgmtInputs_D.bGlobalControlCompleted
X4
SET
gIRJ71PB91 V_1.vSLV002MOD001.outputs
D1015.0
FMOVP
K1
gIRJ71PB91 V_1.vSLV001MOD001.outputs[0]
K7
D1008
MOV
H328
gIRJ71PB91 V_1.stMgmtOutputs_D.uSet_GlobalControl_D
U0\G2081
SET
gIRJ71PB91 V_1.stMgmtOutputs_D.bGlobalControlRequest
Y4
(28)
RefreshStartReq
M0
GlbCtrlReq_2
X26
gIRJ71PB91 V_1.stMgmtOutputs_D.bGlobalControlRequest
Y4
gIRJ71PB91 V_1.stMgmtInputs_D.bGlobalControlCompleted
X4
SET
gIRJ71PB91 V_1.vSLV002MOD001.outputs[1]
D1015.1
FMOVP
K2
gIRJ71PB91 V_1.vSLV001MOD001.outputs[0]
K7
D1008
MOV
H328
gIRJ71PB91 V_1.stMgmtOutputs_D.uSet_GlobalControl_D
U0\G2081
SET
gIRJ71PB91 V_1.stMgmtOutputs_D.bGlobalControlRequest
Y4



■Starting communications

(0) Turn on 'Data exchange start request signal' (Y0).

(7) Turn on Refresh start request (M0).

■First global control SYNC/FREEZE

(12)Set the output data of the ET200S DP-Slave (FDL address 2) and the RJ71PB91V DP-Slave (FDL address 1), set the SYNC/FREEZE service to groups 1 and 2 in 'Global control area' (Un\G2081), and turn on 'Global control request signal' (Y4).

■Second global control SYNC/FREEZE

(28)Set the output data of the ET200S DP-Slave (FDL address 2) and the RJ71PB91V DP-Slave (FDL address 1), set the SYNC/FREEZE service to groups 1 and 2 in 'Global control area' (Un\G2081), and turn on 'Global control request signal' (Y4).

■Checking results of global control request

(44)When 'Global control failed signal' (X5) is off, turn off 'Global control request signal' (Y4) and perform the processing for successful completion. When the 'Global control failed signal' (X5) is on, the 'completed with an error' process is performed and the 'Global control request signal' (Y4) is turned off.

Program example of acyclic communication (acyclic communication)

The following example shows a program to read/write data from/to DP-Slaves at a different timing from I/O data exchanges.
This program example does not use DP-Slaves (FDL address 2 and FDL address 3). (☞ Page 124 System configuration)

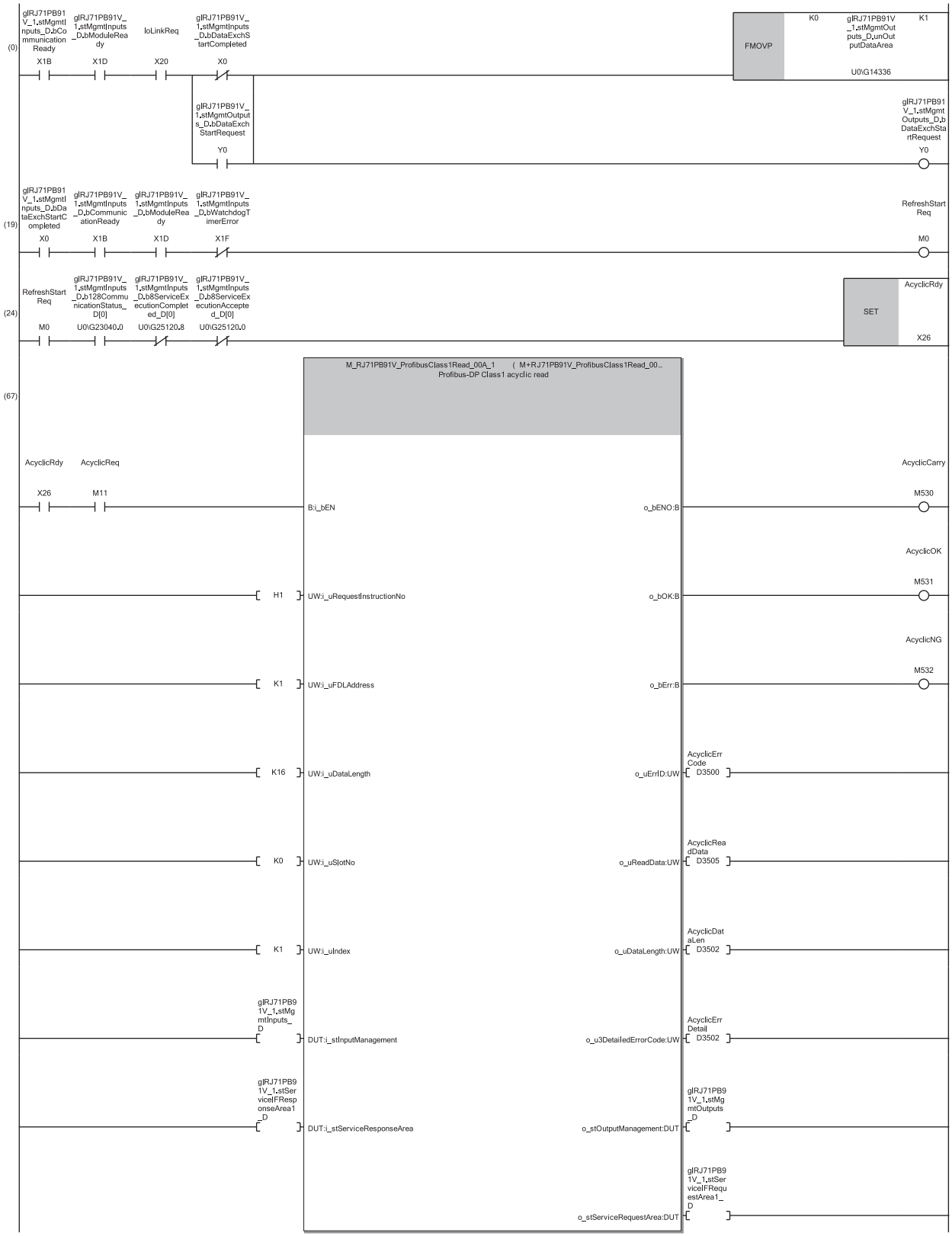
Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted	Data exchange start completed signal	X0
	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady	Communication READY signal	X1B
	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady	Module ready signal	X1D
	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError	Module watchdog timer error signal	X1F
	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y0
	glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea	Output data area (for mode 3)	U0\G14336
	glRJ71PB91V_1.stMgmtInputs_D.b128CommunicationStatus_D[0]	Slave status area (Normal communication detection) on the first device	U0\G23040.0
	glRJ71PB91V_1.stMgmtInputs_D.b8ServiceExecutionCompleted_D[0]	Acyclic communication request result area request completed status in the first bit	U0\G25120.8
	glRJ71PB91V_1.stMgmtInputs_D.b8ServiceExecutionAccepted_D[0]	Acyclic communication request result area request acceptance status in the first bit	U0\G25120.0
	glRJ71PB91V_1.stMgmtInputs_D	PROFIBUS input management area	—
	glRJ71PB91V_1.stServiceIFResponseArea1_D	Service response area	—
	glRJ71PB91V_1.stMgmtOutputs_D	PROFIBUS output management area	—
	glRJ71PB91V_1.stServiceIFRequestArea1_D	Service request area	—
Label to be defined	Define global labels as shown below:		

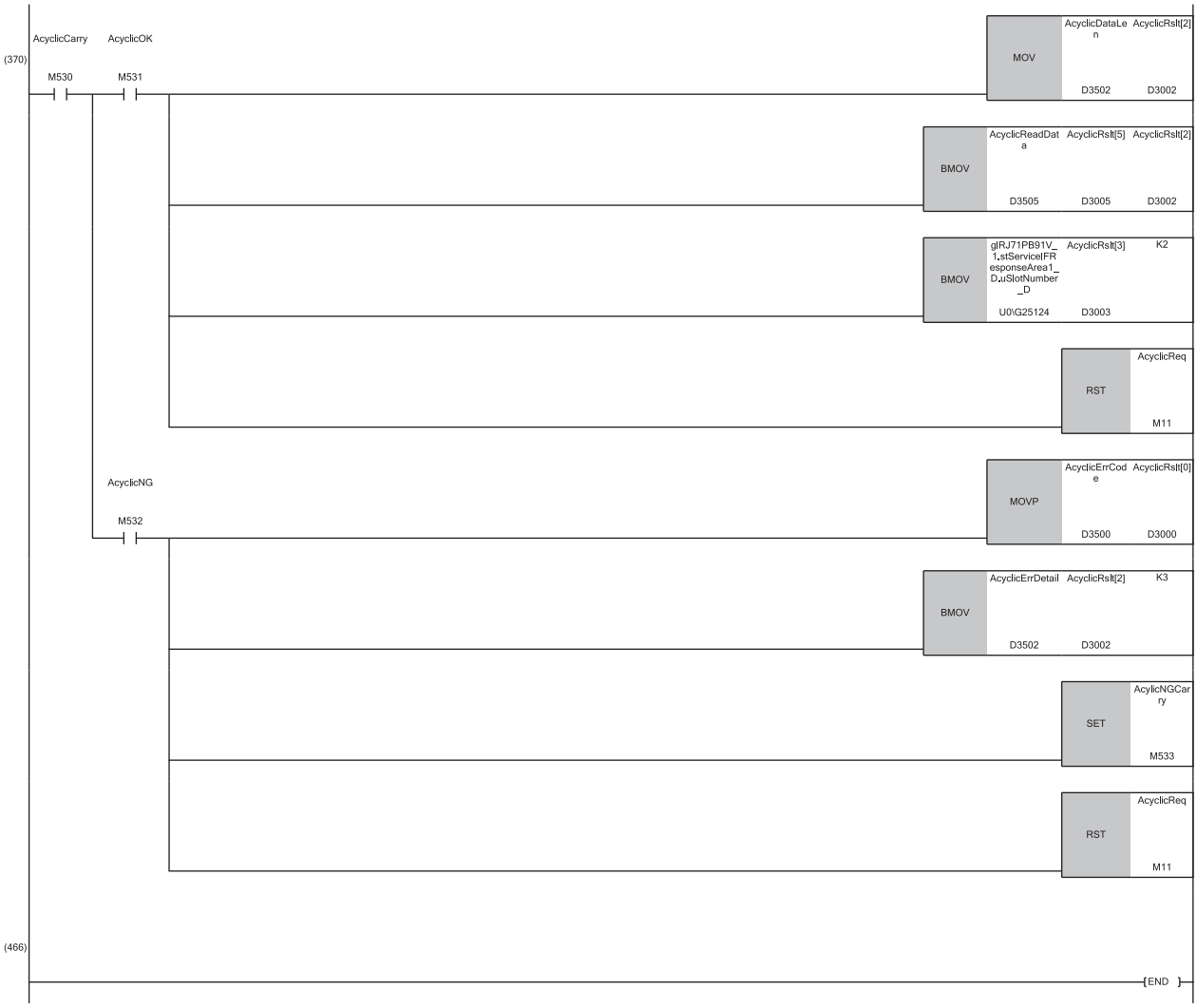
	Label Name	Data Type		Class	Assign (Device/Label)
1	IoLinkReq	Bit	...	VAR_GLOBAL	X20
2	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
3	AcyclicReq	Bit	...	VAR_GLOBAL	M11
4	AcyclicCarry	Bit	...	VAR_GLOBAL	M530
5	AcyclicOK	Bit	...	VAR_GLOBAL	M531
6	AcyclicNG	Bit	...	VAR_GLOBAL	M532
7	AcyclicRdy	Bit	...	VAR_GLOBAL	X26
8	AcyclicErrCode	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D3500
9	AcyclicReadData	Word [Unsigned]/Bit String [16-bit](0..119)	...	VAR_GLOBAL	D3505
10	AcyclicDataLen	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D3502
11	AcyclicErrDetail	Word [Unsigned]/Bit String [16-bit](0..2)	...	VAR_GLOBAL	D3502
12	AcyclicRslt	Word [Unsigned]/Bit String [16-bit](0..127)	...	VAR_GLOBAL	D3000
13	AcylicNGCarry	Bit	...	VAR_GLOBAL	M533

■FBs

The following shows FBs to be used in the program example.

• M_RJ71PB91V_ProfibusClass1Read


(0)
glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady
X1B
glRJ71PB91V_1.stMgmtInputs_D.bModuleReady
X1D
loLinkReq
X20
glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted
X0
FMOVP
K0
glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea
K1
U0\G14336
glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest
Y0
(19)
glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted
X0
glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady
X1B
glRJ71PB91V_1.stMgmtInputs_D.bModuleReady
X1D
glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError
X1F
RefreshStartReq
M0
(24)
RefreshStartReq
M0
glRJ71PB91V_1.stMgmtInputs_D.b128CommunicationStatus_D[0]
U0\G23040.0
glRJ71PB91V_1.stMgmtInputs_D.b8ServiceExecutionCompleted_D[0]
U0\G25120.8
glRJ71PB91V_1.stMgmtInputs_D.b8ServiceExecutionAccepted_D[0]
U0\G25120.0
SET
AcyclicRdy
X26
(67)
M_RJ71PB91V_ProfibusClass1Read_00A_1
(M+RJ71PB91V_ProfibusClass1Read_00...
Profibus-DP Class1 acyclic read
AcyclicRdy
X26
AcyclicReq
M11
B:i_bEN
o_bENO:B
AcyclicCarry
M530
AcyclicOK
M531
H1
UW:i_uRequestInstructionNo
o_bOK:B
AcyclicNG
M532
K1
UW:i_uFDLAddress
o_bErr:B
K16
UW:i_uDataLength
o_uErrID:UW
AcyclicErrCode
D3500
K0
UW:i_uSlotNo
o_uReadData:UW
AcyclicReadData
D3505
K1
UW:i_uIndex
o_uDataLength:UW
AcyclicDataLen
D3502
glRJ71PB91V_1.stMgmtInputs_D
DUT:i_stInputManagement
o_u3DetailedErrorCode:UW
AcyclicErrDetail
D3502
glRJ71PB91V_1.stServiceIFResponseArea1_D
DUT:i_stServiceResponseArea
o_stOutputManagement:DUT
glRJ71PB91V_1.stMgmtOutputs_D
o_stServiceRequestArea:DUT
glRJ71PB91V_1.stServiceIFRequestArea1_D



(24)Turn on X26 (Preparation completed for execution of acyclic function block).
(67)Execute the M+RJ71PB91V_ProfibusClass1Read function block.
Set the following as input arguments.
- Request instruction number: 1
- FDL address: 1
- Read data length: 16
- Slot number: 0
- Index: 1
- PROFIBUS input management area: glRJ71PB91V_1.stMgmtInputs_D
- Service response area: glRJ71PB91V_1.stServiceIFResponseArea1_D

Set the following as output arguments.
- Execution status: M530
- Completed successfully: M531
- Completed with an error: M532
- Error ID: D3500
- Read data storage location: D3505
- Read data length: D3502
- Error details: D3502
- PROFIBUS output management area: glRJ71PB91V_1.stMgmtOutputs_D
- Service request area: glRJ71PB91V_1.stServiceIFRequestArea1_D

(370)Store the read results in each area and turn off M11 (acyclic function block execution command). Acquire error ID and error details, performs 'completed with an error' process and turn off M11 (acyclic function block execution command).

Program example of the alarm acquisition function

The DP-Master acquires alarm or status information from the DP-Slaves. (☞ Page 34 Using Alarm read request (with ACK))

This program example does not use DP-Slaves (FDL address 2 and FDL address 3). (☞ Page 124 System configuration)

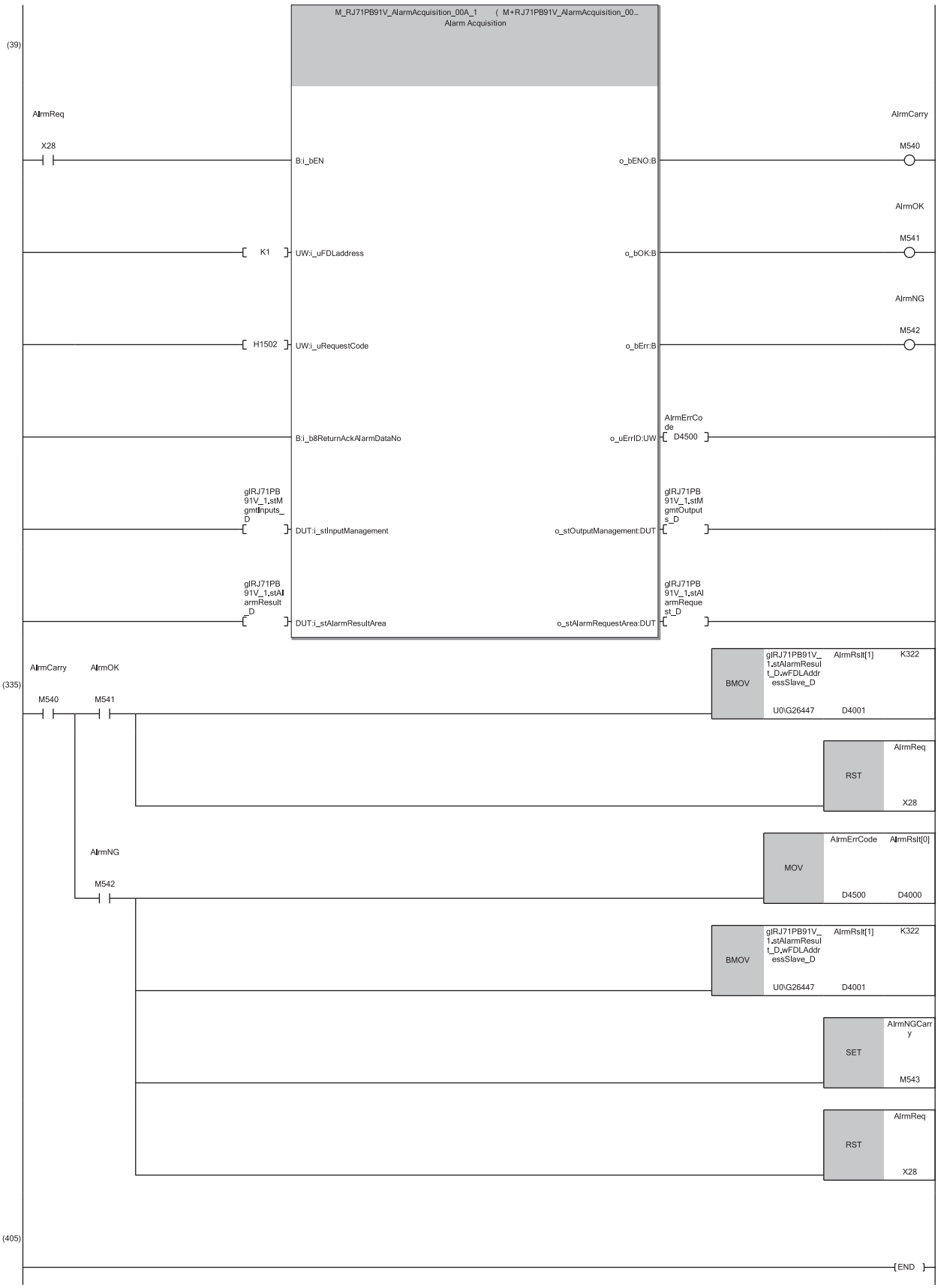
Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y0
	glRJ71PB91V_1.stMgmtOutputs_D.bAlarmReadRequest	Alarm read request signal	Y18
	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted	Data exchange start completed signal	X0
	glRJ71PB91V_1.stMgmtInputs_D.bAlarmReadResponse	Alarm read response	X18
	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady	Communication READY signal	X1B
	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady	Module ready signal	X1D
	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError	Module watchdog timer error signal	X1F
	glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea	Output data area (for mode 3)	U0\G14336
	glRJ71PB91V_1.stMgmtInputs_D.b128StationAlarmStatus_D[0]	Slave status area (Alarm information detection) on the first station	U0\G26417.0
	glRJ71PB91V_1.stAlarmResult_D.wFDLAddressSlave_D	Alarm response area: FDL address of DP-Slave	U0\G26447
	glRJ71PB91V_1.stMgmtInputs_D	PROFIBUS input management area	—
	glRJ71PB91V_1.stAlarmResult_D	Alarm response area	—
	glRJ71PB91V_1.stMgmtOutputs_D	PROFIBUS output management area	—
	glRJ71PB91V_1.stAlarmRequest_D	Alarm request area	—
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)
1	IoLinkReq	Bit	...	VAR_GLOBAL	X20
2	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
3	AlrmCarry	Bit	...	VAR_GLOBAL	M540
4	AlrmErrCode	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D4500
5	AlrmNG	Bit	...	VAR_GLOBAL	M542
6	AlrmOK	Bit	...	VAR_GLOBAL	M541
7	AlrmReq	Bit	...	VAR_GLOBAL	X28
8	AlrmRslt	Word [Unsigned]/Bit String [16-bit](0..322)	...	VAR_GLOBAL	D4000
9	AlrmNGCarry	Bit	...	VAR_GLOBAL	M543

■FBs

The following shows FBs to be used in the program example.

• M_RJ71PB91V_AlarmAcquisition


(39)
M_RJ71PB91V_AlarmAcquisition_00A_1
(M+RJ71PB91V_AlarmAcquisition_00...
Alarm Acquisition
AlrmReq
X28
B:i_bEN
o_bENO:B
AlrmCarry
M540
AlrmOK
M541
K1
UW:i_uFDLaddress
o_bOK:B
AlrmNG
M542
H1502
UW:i_uRequestCode
o_bErr:B
B:i_b8ReturnAckAlarmDataNo
o_uErrID:UW
AlrmErrCode
D4500
glRJ71PB91V_1,stMgmtInputs_D
DUT:i_stInputManagement
o_stOutputManagement:DUT
glRJ71PB91V_1,stMgmtOutputs_D
glRJ71PB91V_1,stAlarmResult_D
DUT:i_stAlarmResultArea
o_stAlarmRequestArea:DUT
glRJ71PB91V_1,stAlarmRequest_D
(335)
AlrmCarry
AlrmOK
M540
M541
BMOV
glRJ71PB91V_1,stAlarmResult_D,wFDLAddressSlave_D
AlrmRslt[1]
K322
U0\G26447
D4001
RST
AlrmReq
X28
AlrmNG
M542
MOV
AlrmErrCode
AlrmRslt[0]
D4500
D4000
SET
AlrmNGCarry
M543
(405)
END

(24)Turn on X28 (alarm function block execution command).
(39)Turn on X28 (alarm function block execution command) and executes the M+RJ71PB91V_AlarmAcquisition function block.
Set the following as input arguments.
 • FDL address: 1
 • Request code: 1502H
 • PROFIBUS input management area: glRJ71PB91V_1.stMgmtInputs_D
 • Alarm response area: glRJ71PB91V_1.stAlarmResult_D
Set the following as output arguments.
 • Execution status: M540
 • Completed successfully: M541
 • Completed with an error: M542
 • Error ID: D4500
 • PROFIBUS output management area: glRJ71PB91V_1.stMgmtOutputs_D
 • Alarm request area: glRJ71PB91V_1.stAlarmRequest_D
(335)Store the read results and turn off X28 (alarm function block execution command). Acquire error ID and error details, performs 'completed with an error' process and turn off X28 (alarm function block execution command).

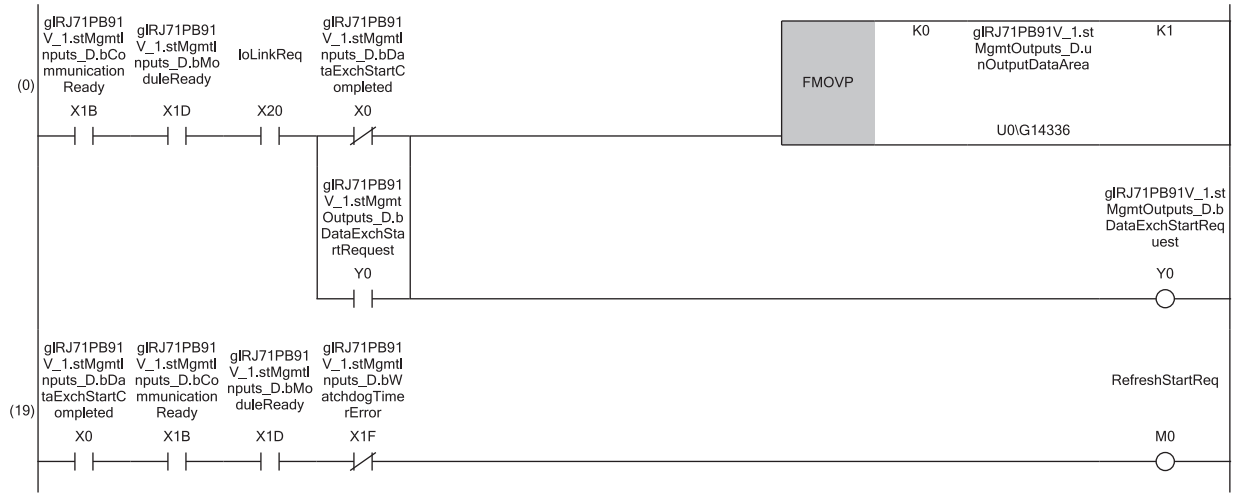
Program example of the time control over DP-Slaves

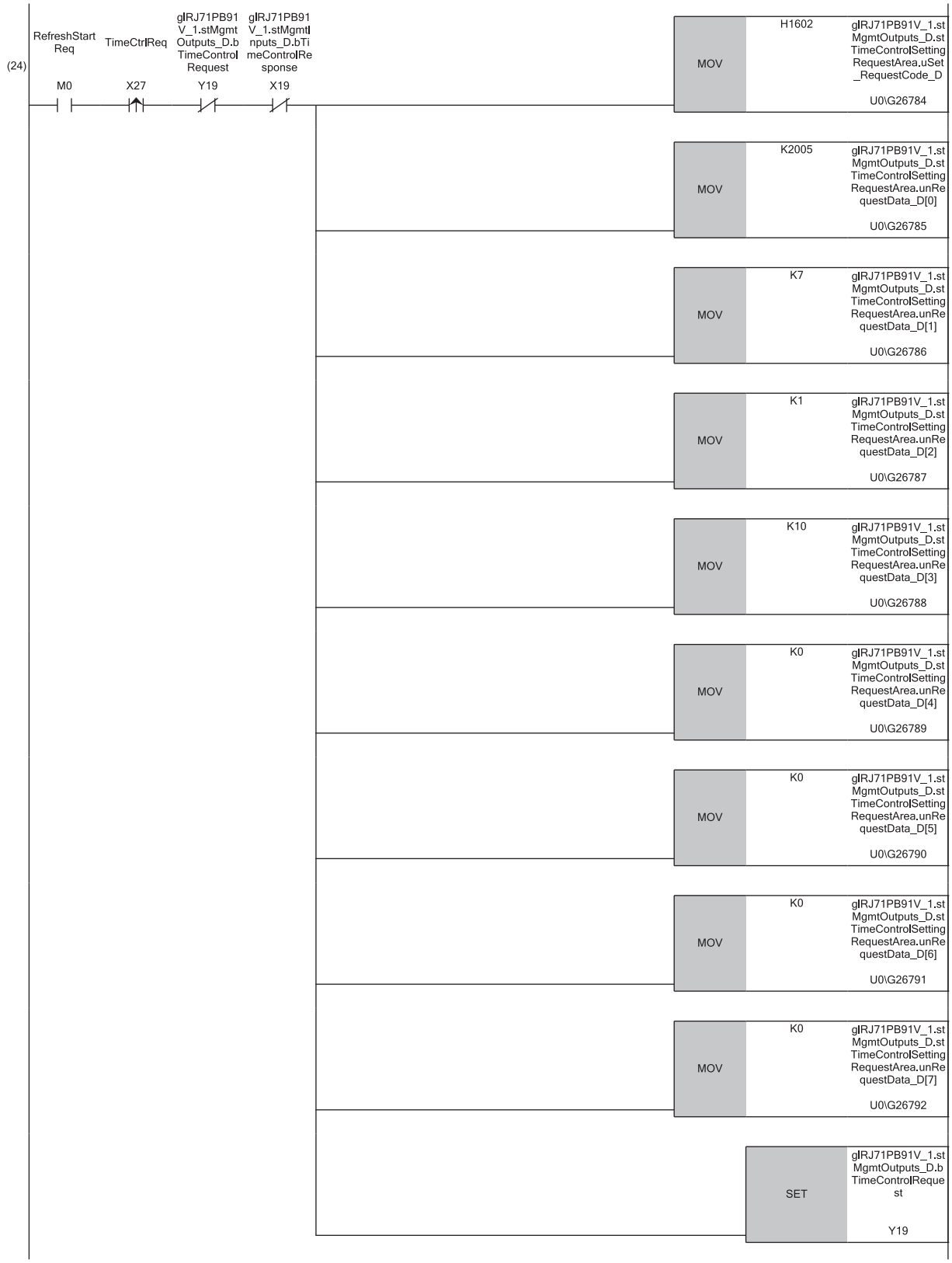
The following example shows a program to operate the DP-Master as the time master and set the clock of DP-Slaves to a specific time.

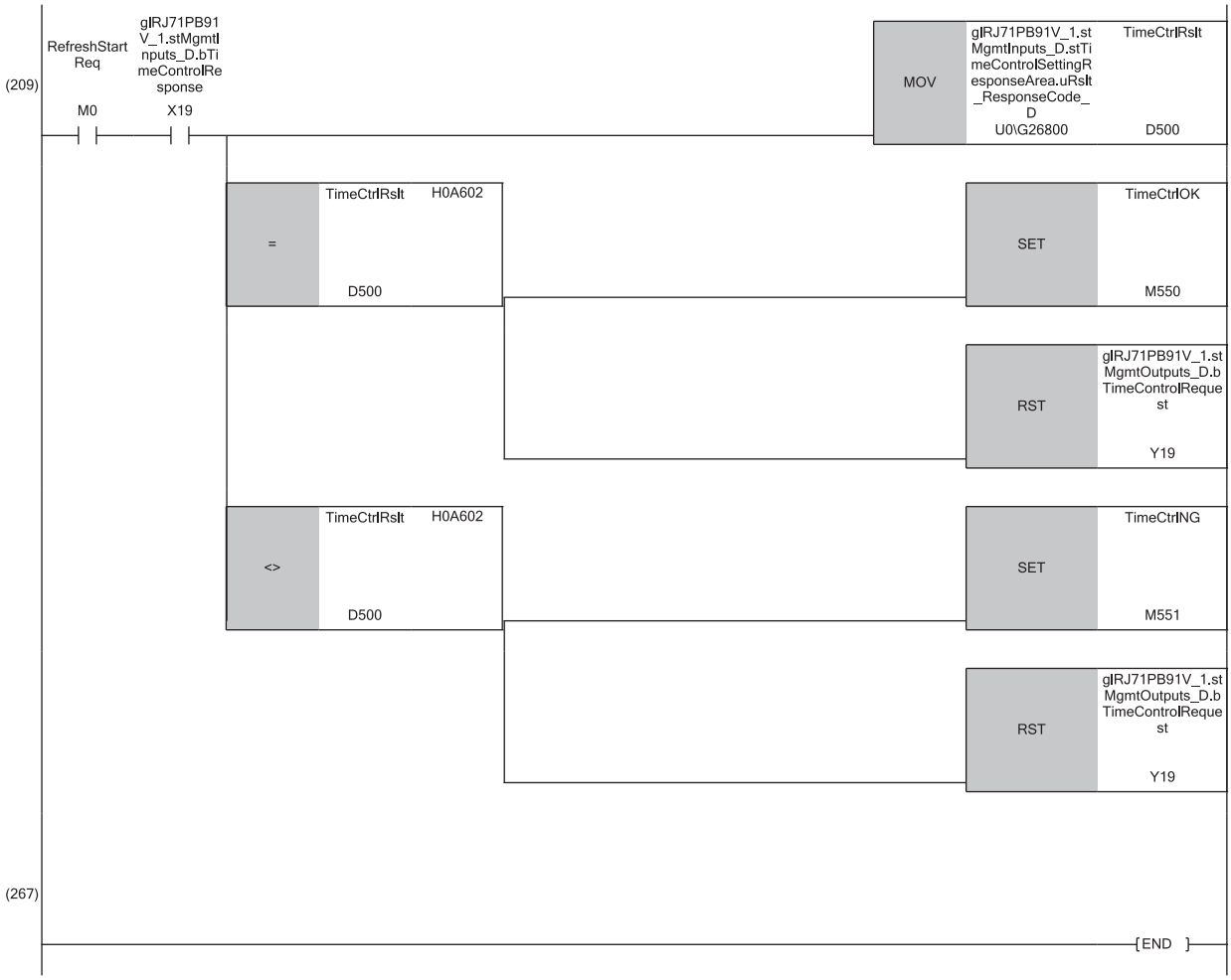
This program example does not use DP-Slaves (FDL address 2 and FDL address 3). (☞ Page 124 System configuration)

Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y0
	glRJ71PB91V_1.stMgmtOutputs_D.bTimeControlRequest	Time control start request signal	Y19
	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted	Data exchange start completed signal	X0
	glRJ71PB91V_1.stMgmtInputs_D.bTimeControlResponse	Time control start response	X19
	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady	Communication READY signal	X1B
	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady	Module ready signal	X1D
	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError	Module watchdog timer error signal	X1F
	glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea	Output data area (for mode 3)	U0\G14336
	glRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.uSet_RequestCode_D	Time control setting request area: Request code	U0\G26784
	glRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D	Time control setting request area: Data	U0\G26785
	glRJ71PB91V_1.stMgmtInputs_D.stTimeControlSettingResponseArea.uRslt_ResponseCode_D	Time control setting response area: Response code	U0\G26800
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)
1	IoLinkReq	Bit	...	VAR_GLOBAL	X20
2	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
3	TimeCtrlReq	Bit	...	VAR_GLOBAL	X27
4	TimeCtrlRslt	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D500
5	TimeCtrlOK	Bit	...	VAR_GLOBAL	M550
6	TimeCtrlNG	Bit	...	VAR_GLOBAL	M551




(24)
RefreshStart Req
M0
TimeCtrlReq
X27
gIRJ71PB91V_1.stMgmtOutputs_D.bTimeControlRequest
Y19
gIRJ71PB91V_1.stMgmtInputs_D.bTimeControlResponse
X19
MOV
H1602
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.uSet_RequestCode_D
U0\G26784
MOV
K2005
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[0]
U0\G26785
MOV
K7
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[1]
U0\G26786
MOV
K1
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[2]
U0\G26787
MOV
K10
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[3]
U0\G26788
MOV
K0
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[4]
U0\G26789
MOV
K0
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[5]
U0\G26790
MOV
K0
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[6]
U0\G26791
MOV
K0
gIRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D[7]
U0\G26792
SET
gIRJ71PB91V_1.stMgmtOutputs_D.bTimeControlRequest
Y19



(24)Set write request data for 'Time control setting request area' (Un\G26784 to Un\G26792) and turn on 'Time control start request signal' (Y19).

(209)Acquire response result from 'Time control setting response area' (Un\G26800 to Un\G26812). When completed successfully, the successful completion process is performed. When completed with an error, the 'completed with an error' process is performed. Finally, 'Time control start request signal' (Y19) is turned off.

4.7 Program Example of DP-Slaves

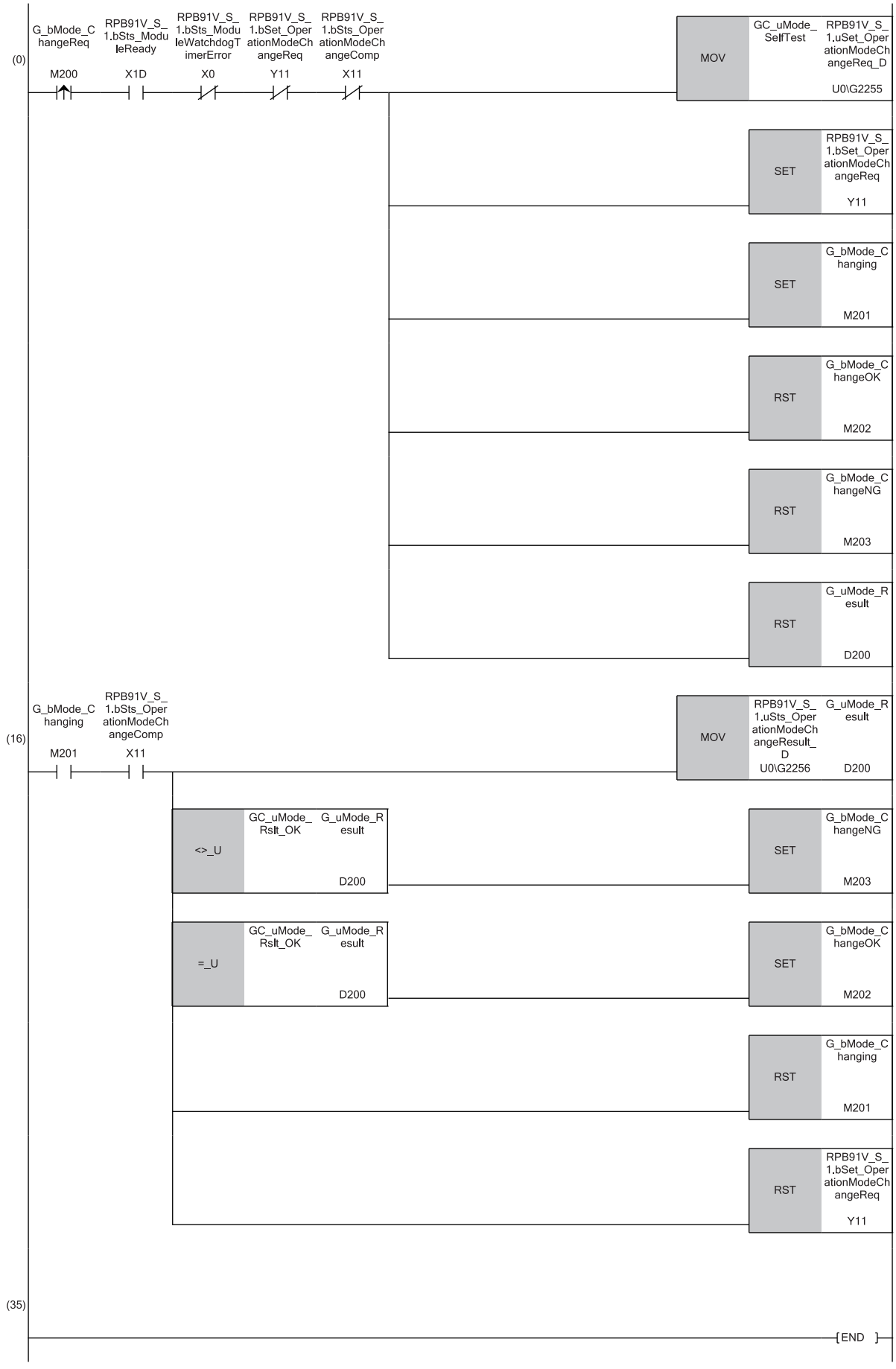
Program example for changing operation mode (self-diagnostics test)

The following example shows a program to change the operation mode to the self-diagnostic mode (mode 2) and execute the self-diagnostics test without performing communications.

This program example does not use DP-Master. (☞ Page 124 System configuration)

Classification	Label name	Description	Device
Module label	RPB91V_S_1.bSts_ModuleWatchdogTimerError	Module watchdog timer error signal	X0
	RPB91V_S_1.bSts_OperationModeChangeComp	Operation mode change completed	X11
	RPB91V_S_1.bSts_ModuleReady	Module ready	X1D
	RPB91V_S_1.bSet_OperationModeChangeReq	Operation mode change request	Y11
	RPB91V_S_1.uSet_OperationModeChangeReq_D	Operation mode change request (direct)	U0\G2255
	RPB91V_S_1.uSts_OperationModeChangeResult_D	Operation mode change result (direct)	U0\G2256
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)	Constant
1	G_bMode_ChangeReq	Bit	...	VAR_GLOBAL	M200	
2	G_bMode_Changing	Bit	...	VAR_GLOBAL	M201	
3	G_bMode_ChangeOK	Bit	...	VAR_GLOBAL	M202	
4	G_bMode_ChangeNG	Bit	...	VAR_GLOBAL	M203	
5	G_uMode_Result	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D200	
6	GC_uMode_SelfTest	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL_CONSTANT		2
7	GC_uMode_Rslt_OK	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL_CONSTANT		0


(0)
G_bMode_ChangeReq
M200
RPB91V_S_1.bSts_ModuleReady
X1D
RPB91V_S_1.bSts_ModuleWatchdogTimerError
X0
RPB91V_S_1.bSet_OperationModeChangeReq
Y11
RPB91V_S_1.bSts_OperationModeChangeComp
X11
MOV
GC_uMode_SelfTest
RPB91V_S_1.uSet_OperationModeChangeReq_D
U0\G2255
SET
RPB91V_S_1.bSet_OperationModeChangeReq
Y11
SET
G_bMode_Changing
M201
RST
G_bMode_ChangeOK
M202
RST
G_bMode_ChangeNG
M203
RST
G_uMode_Result
D200
(16)
G_bMode_Changing
M201
RPB91V_S_1.bSts_OperationModeChangeComp
X11
MOV
RPB91V_S_1.uSts_OperationModeChangeResult_D
U0\G2256
G_uMode_Result
D200
<>_U
GC_uMode_Rslt_OK
G_uMode_Result
D200
SET
G_bMode_ChangeNG
M203
=_U
GC_uMode_Rslt_OK
G_uMode_Result
D200
SET
G_bMode_ChangeOK
M202
RST
G_bMode_Changing
M201
RST
RPB91V_S_1.bSet_OperationModeChangeReq
Y11
(35)
END

(0) Start the change of the operation mode as follows when Operation mode change request flag (M200) rises.
- Store Self-diagnostic mode (K2) in 'Operation mode change request' (U0\G2255), and set the self-diagnostic mode (mode 2) to the changed operation mode.
- Turn on 'Operation mode change request' (Y11) to request the change of the operation mode.
- After the change of the operation mode is started, turn on Operation mode being changed (M201), and update the interlock device.
- Initialize (clear) the results of the previous change of the operation mode using Operation mode changed successfully (M202), Operation mode change failed (M203), or Operation mode change result (D200).

(16)Acquire the results of the change of the operation mode, and execute the processing according to the acquired results as follows.
- Acquire the results of the change from 'Operation mode change result' (U0\G2256), and transfer them to Operation mode change result (D200).
- When the change has been completed with an error (when Operation mode change result (D200) is other than 0), execute the relevant processing (in this step, turn on Operation mode change failed (M203)).
- When the change has been completed successfully (when Operation mode change result (D200) is 0), execute the relevant processing (in this step, turn on Operation mode changed successfully (M202)).
- After the operation mode has been changed, turn off Operation mode being changed (M201), and update the interlock device.
- Turn off 'Operation mode change request' (Y11) to complete the change of the operation mode.

■Precautions

When the module is in either of the following state, the operation mode will not be changed even when the change of the operation mode is requested (by turning off and on Operation mode change request flag (M200)).
- The module has not been started or a module watchdog timer error has occurred.
- Operation mode is being changed.

Program example of notification request of extended diagnostic information

The following example shows a program to issue the extended diagnostic information that notifies error detection or error correction from the DP-Slave to the DP-Master. The status code of the DP-Slave is issued as the extended diagnostic information. (☞ Page 185 List of Status Codes)

This program example uses the module function block (M+RJ71PB91V_S_NotifyMstExtDiagInfo). (📖 MELSEC iQ-R PROFIBUS-DP Module Function Block Reference)

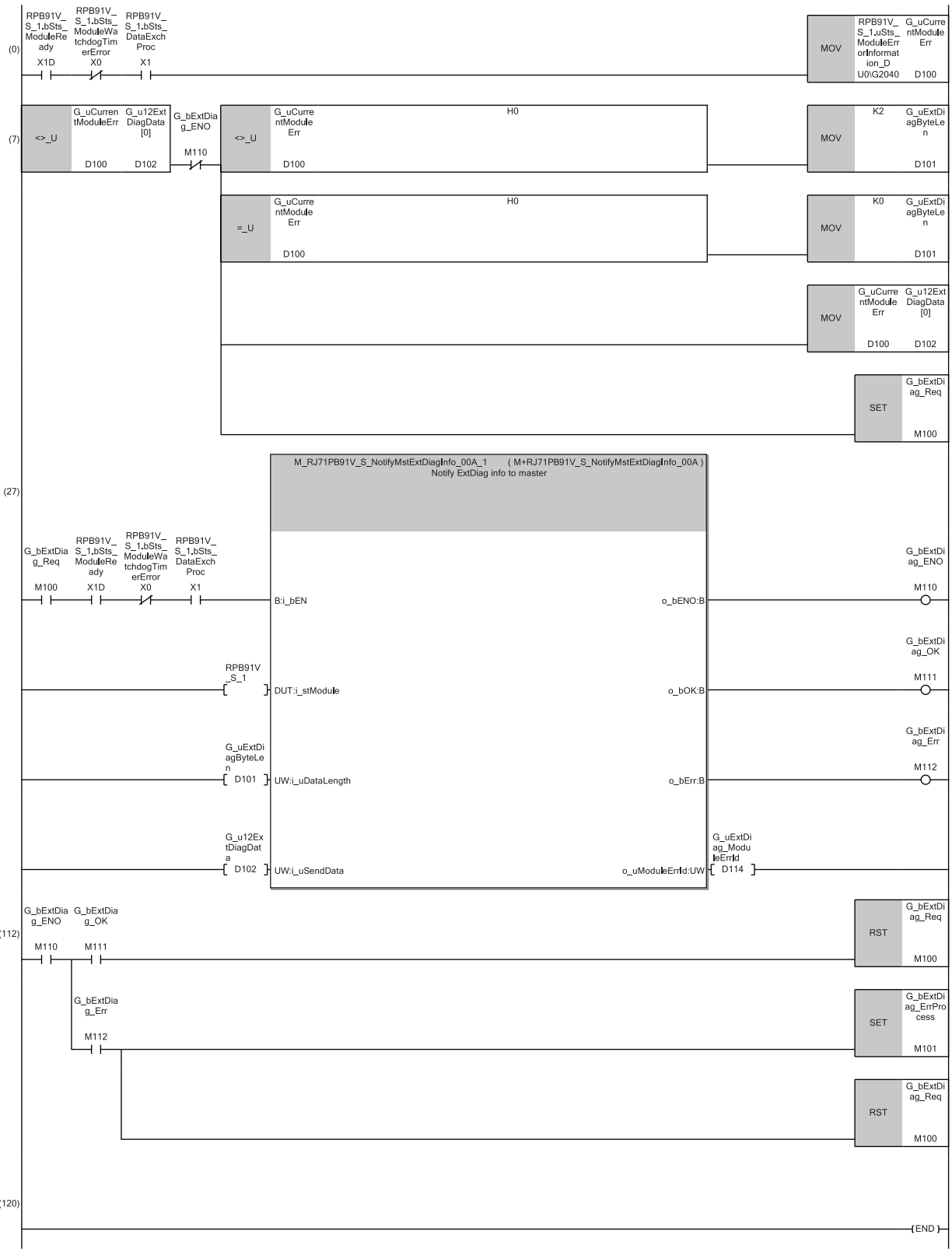
Classification	Label name	Description	Device
Module label	RPB91V_S_1.bSts_ModuleWatchdogTimerError	Module watchdog timer error signal	X0
	RPB91V_S_1.bSts_DataExchProc	Data exchanging	X1
	RPB91V_S_1.bSts_ModuleReady	Module ready	X1D
	RPB91V_S_1.uSts_ModuleErrorInformation_D	Module error information (direct)	U0\G2040
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)
1	G_bExtDiag_Req	Bit	...	VAR_GLOBAL	M100
2	G_bExtDiag_ErrProcess	Bit	...	VAR_GLOBAL	M101
3	G_uCurrentModuleErr	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D100
4	G_uExtDiagByteLen	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D101
5	G_u12ExtDiagData	Word [Unsigned]/Bit String [16-bit](0..11)	...	VAR_GLOBAL	D102
6	G_bExtDiag_ENO	Bit	...	VAR_GLOBAL	M110
7	G_bExtDiag_OK	Bit	...	VAR_GLOBAL	M111
8	G_bExtDiag_Err	Bit	...	VAR_GLOBAL	M112
9	G_uExtDiag_ModuleErrId	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D114

■FBs

The following shows FBs to be used in the program example.

• M_RJ71PB91V_S_NotifyMstExtDiagInfo


(0)
RPB91V_S_1.bSts_ModuleReady
X1D
RPB91V_S_1.bSts_ModuleWatchdogTimerError
X0
RPB91V_S_1.bSts_DataExchProc
X1
MOV
RPB91V_S_1.uSts_ModuleErrorInformation_D
U0\G2040
G_uCurrentModuleErr
D100
(7)
<>_U
G_uCurrentModuleErr
D100
G_u12ExtDiagData[0]
D102
G_bExtDiag_ENO
M110
<>_U
G_uCurrentModuleErr
D100
H0
MOV
K2
G_uExtDiagByteLen
D101
=_U
G_uCurrentModuleErr
D100
H0
MOV
K0
G_uExtDiagByteLen
D101
MOV
G_uCurrentModuleErr
D100
G_u12ExtDiagData[0]
D102
SET
G_bExtDiag_Req
M100
(27)
M_RJ71PB91V_S_NotifyMstExtDiagInfo_00A_1 (M+RJ71PB91V_S_NotifyMstExtDiagInfo_00A)
Notify ExtDiag info to master
G_bExtDiag_Req
M100
RPB91V_S_1.bSts_ModuleReady
X1D
RPB91V_S_1.bSts_ModuleWatchdogTimerError
X0
RPB91V_S_1.bSts_DataExchProc
X1
B:i_bEN
o_bENO:B
G_bExtDiag_ENO
M110
RPB91V_S_1
DUT:i_stModule
o_bOK:B
G_bExtDiag_OK
M111
G_uExtDiagByteLen
D101
UW:i_uDataLength
o_bErr:B
G_bExtDiag_Err
M112
G_u12ExtDiagData
D102
UW:i_uSendData
o_uModuleErrId:UW
G_uExtDiag_ModuleErrId
D114
(112)
G_bExtDiag_ENO
M110
G_bExtDiag_OK
M111
RST
G_bExtDiag_Req
M100
G_bExtDiag_Err
M112
SET
G_bExtDiag_ErrProcess
M101
RST
G_bExtDiag_Req
M100
(120)
END

(0) Acquire the status code from 'Module error information' (Un\G2040), and transfer it to Current status code (D100) of the module.
(7) Request the extended diagnostic information notification as follows when Extended diagnostic information data (D102) that was sent last is different from Current status code (D100) and Extended diagnostic information notification FB execution status flag (M110) is off.
• When an error has been detected (when Current status code (D100) of the module is other than 0), set the data length of Extended diagnostic information byte size (D101) to 2 bytes.
• When an error has not been detected or has been corrected (when Current status code (D100) of the module is 0), set the data length of Extended diagnostic information byte size (D101) to 0 byte.
• Current status code (D100) of the module is stored in Extended diagnostic information data (D102).
• Turn on Extended diagnostic information notification/correction notification request flag (M100).
(27)Execute the module function block (M+RJ71PB91V_S_NotifyMstExtDiagInfo).
Specify an input argument as shown below:
• Module label: RPB91V_S_1...
• Data length of extended diagnostic information: D101
• Storage location of extended diagnostic information: D102
Specify an output argument as shown below:
• Execution status: M110
• Completed successfully: M111
• Completed with an error: M112
• Module error code: D114
(112)Execute the following processing according to the execution result of the module function block.
• Completed successfully: Clear the execution request of the module function block (by turning off Extended diagnostic information notification/correction notification request flag (M100)).
• Completed with an error: Execute the relevant processing (in this step, turn on M101 (Extended diagnostic information notification/correction error processing)), and then clear the execution request of the module function block (by turning off Extended diagnostic information notification/correction notification request flag (M100)).

Precautions

- Arbitrary data can be notified as the extended diagnostic information. This program example uses the status code as the extended diagnostic information. Change the data to be stored or data length as necessary.
- In this program example, when I/O data exchanges are stopped while the module function block is executed, the processing of the module function block is stopped. When I/O data exchanges resume thereafter, the module function block is executed again. In this case, the status code for the resumed I/O data exchanges are notified.

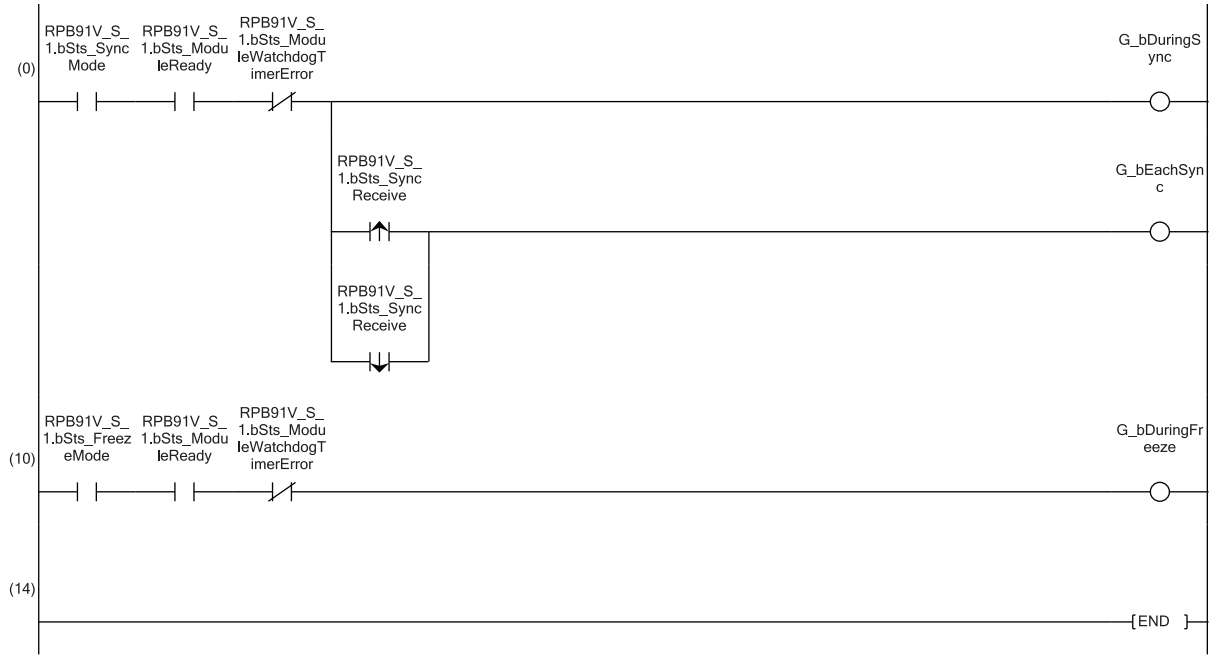
Program example for executing global control

The following example shows a program to execute the processing using the service received from the DP-Master as a trigger.

DP-Slaves automatically hold/clear the I/O data when receiving the service from the DP-Master. Therefore, the synchronous processing does not use a program.

Classification	Label name	Description	Device
Module label	RPB91V_S_1.bSts_ModuleWatchdogTimerError	Module watchdog timer error signal	X0
	RPB91V_S_1.bSts_SyncMode	During SYNC mode	X5
	RPB91V_S_1.bSts_SyncReceive	SYNC receive	X6
	RPB91V_S_1.bSts_FreezeMode	During FREEZE mode	X7
	RPB91V_S_1.bSts_ModuleReady	Module ready	X1D
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)
1	G_bDuringSync	Bit	...	VAR_GLOBAL	M1
2	G_bEachSync	Bit	...	VAR_GLOBAL	M2
3	G_bDuringFreeze	Bit	...	VAR_GLOBAL	M3



(0) Execute the following processing when 'During SYNC mode' (X5) is on.

- Turning on SYNC processing flag (M1) triggers the processing executed during the SYNC mode.
- When 'SYNC receive' (X6) is turned off and on or turned on and off, turning on Processing for each received SYNC service flag (M2) triggers the processing executed for each received SYNC service.

(10)When 'During FREEZE mode' (X7) is on, turning on FREEZE processing flag (M3) triggers the processing executed during the FREEZE mode.

■Precautions

- When the sequence scan time is larger than the bus cycle time, 'SYNC receive signal' (X6) may not be inverted even when the SYNC service is received. In this case, do not use 'SYNC receive signal' (X6) as a trigger of receive processing. Execute the receive processing for each scan. (It is because the on/off status of X6 signal is inverted again and reset to the previous state when the SYNC service is received an even number of times during sequence scan.)
- To prevent I/O data from separating in the SYNC mode or FREEZE mode, use the data consistency function, too.

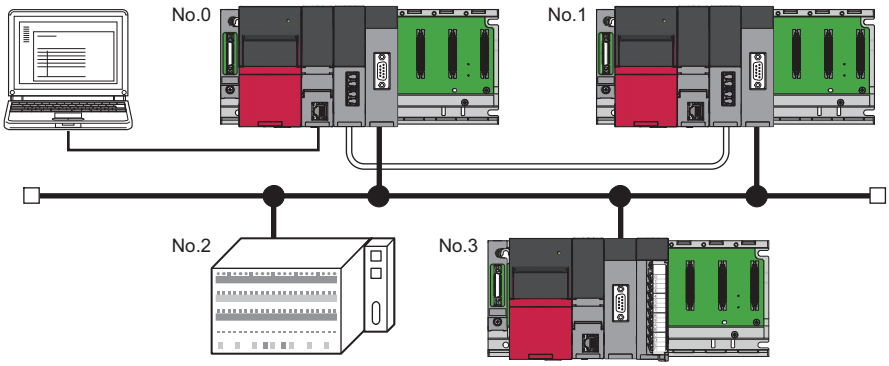
4.8 Program Example of Redundant System

The following shows a program example when the RJ71PB91V is used in the redundant system.

Point

When the RJ71PB91V is used in the redundant system, tracking transfer setting is required to keep executing functions after system switching because some functions have restrictions. ☞ Page 56 Restricted functions in the redundant system

System configuration example



Numbers and station types	Module
No.0: DP-Master of control system (FDL address 0)	• Power supply module: R61P • Process CPU (redundant mode): R08PCPU • Redundant function module: R6RFM (start I/O number: 0000H to 001FH) • RJ71PB91V (start I/O number: 0020H to 003FH)
No.1: DP-Master of standby system (FDL address 1)	
No.2: DP-Slave (FDL address 2)	ET200S from Siemens K.K. (HighFeature(Cu))
No.3: DP-Slave (FDL address 3)	• Power supply module: R61P • CPU module: R04CPU • RJ71PB91V(S) (start I/O number: 0000H to 001FH) • RX40C7 (start I/O number: 0020H to 002FH)

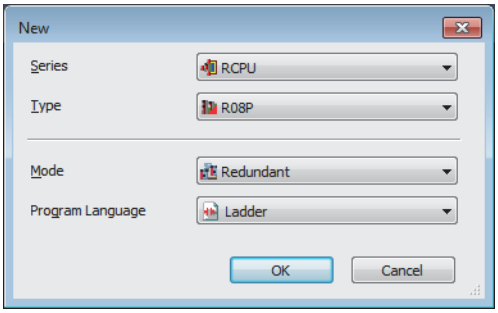
DP-Master settings

Connect the engineering tool to the CPU module of control system, and set the parameters.
Because the same programs and parameters are written to both systems in the redundant system, creating a new project for standby system is not required.

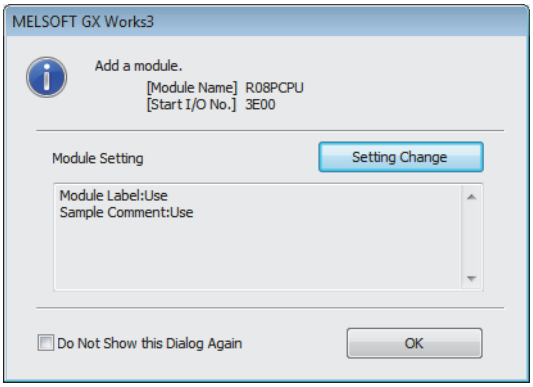
Creating a new project

1. Set the CPU module as follows.

[Project] ⇨ [New]



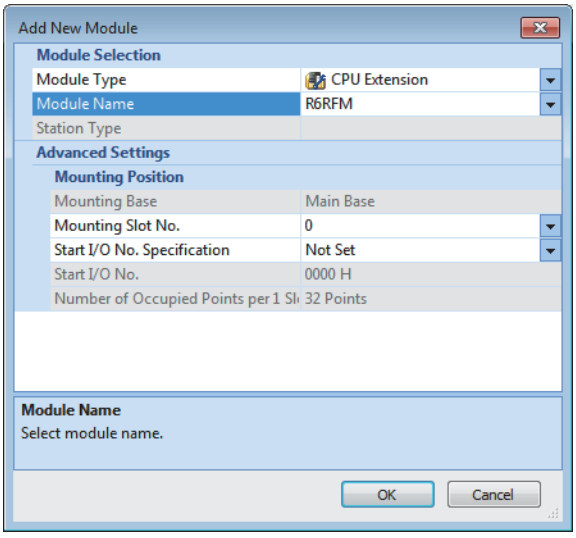
2. Click the [Setting Change] button and set the [Module Label] to [Use].



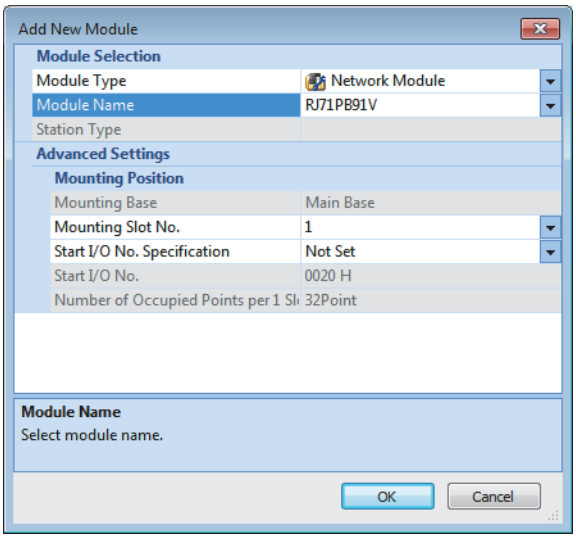
3. Click the [OK] button to add module labels of the CPU module.

4. Set the redundant function module to slot number 0 in the I/O assignment setting.

[Navigation window] ⇨ [Parameter] ⇨ [System Parameter] ⇨ [I/O Assignment] tab ⇨ [I/O Assignment Setting]

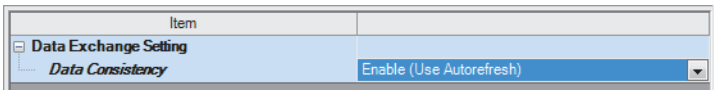


5. Set the RJ71PB91V to slot number 1.



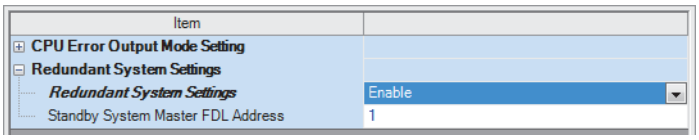
6. To enable the data consistency function, set the items in "Basic Setting" as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Module Parameter] ⇨ [Basic Setting]



7. Set the items in "Application Setting" as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Module Parameter] ⇨ [Application Setting]



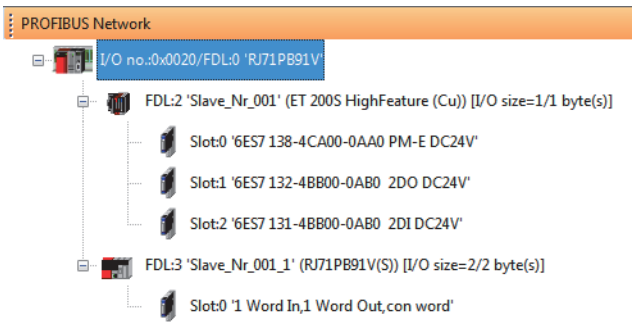
PROFIBUS module setting

1. Start PROFIBUS Configuration Tool from the engineering tool.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting]

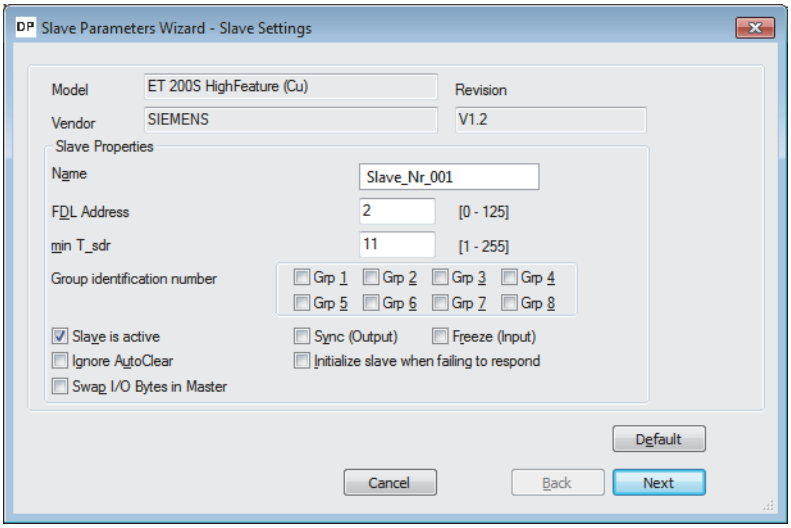
2. Add DP-Slaves to the project. When the DP-Slave to be added is not in [Global GSD Database] tab, add GSD file of DP-Slave to GSD database. (☞ Page 79 Add GSD File)

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ [Global GSD Database] tab ⇨ Target DP-Slave ⇨ Right-click ⇨ [Add Slave to Project]

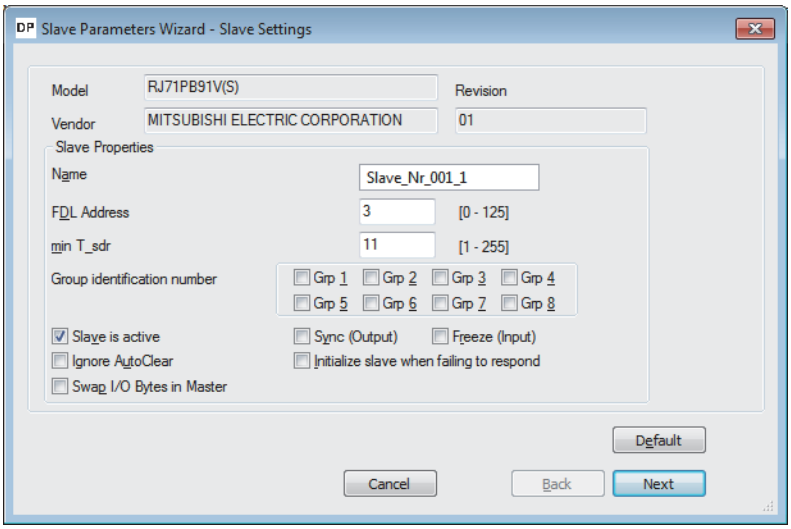


3. Set the items in the "Slave Settings" window as follows.

• DP-Slave (FDL address 2)



• DP-Slave (FDL address 3)



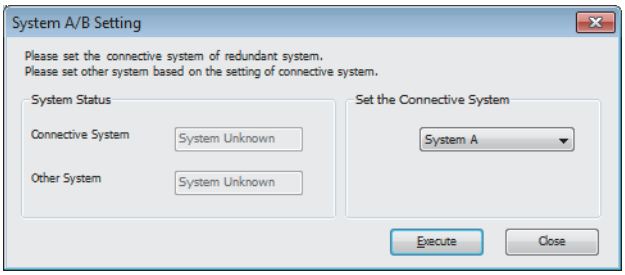
4. Set the items in the "Master Settings" window as follows. (☞ Page 106 Master Settings)

5. Update the PROFIBUS labels. (☞ Page 131 Update PROFIBUS Labels)

Writing parameters

1. Set the redundant function module of the own system to system A in the "System A/B Setting" window and reset the CPU modules of both systems or turn off and on the power of both systems.

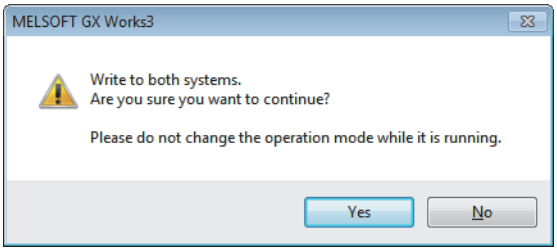
[Online] ⇨ [Redundant PLC Operation] ⇨ [System A/B Setting]



2. Write the set parameters to the CPU module of system A.

[Online] ⇨ [Write to PLC]

3. Click [Yes] and write the parameters to the CPU modules of both systems.



4. Reset the CPU modules of both systems or turn off and on the power of both systems.

Point

In this example, default values are used for parameters that are not shown above. For the parameters, refer to the parameter chapter of this manual. (☞ Page 61 PARAMETER SETTINGS)

Program example of the I/O data exchange function

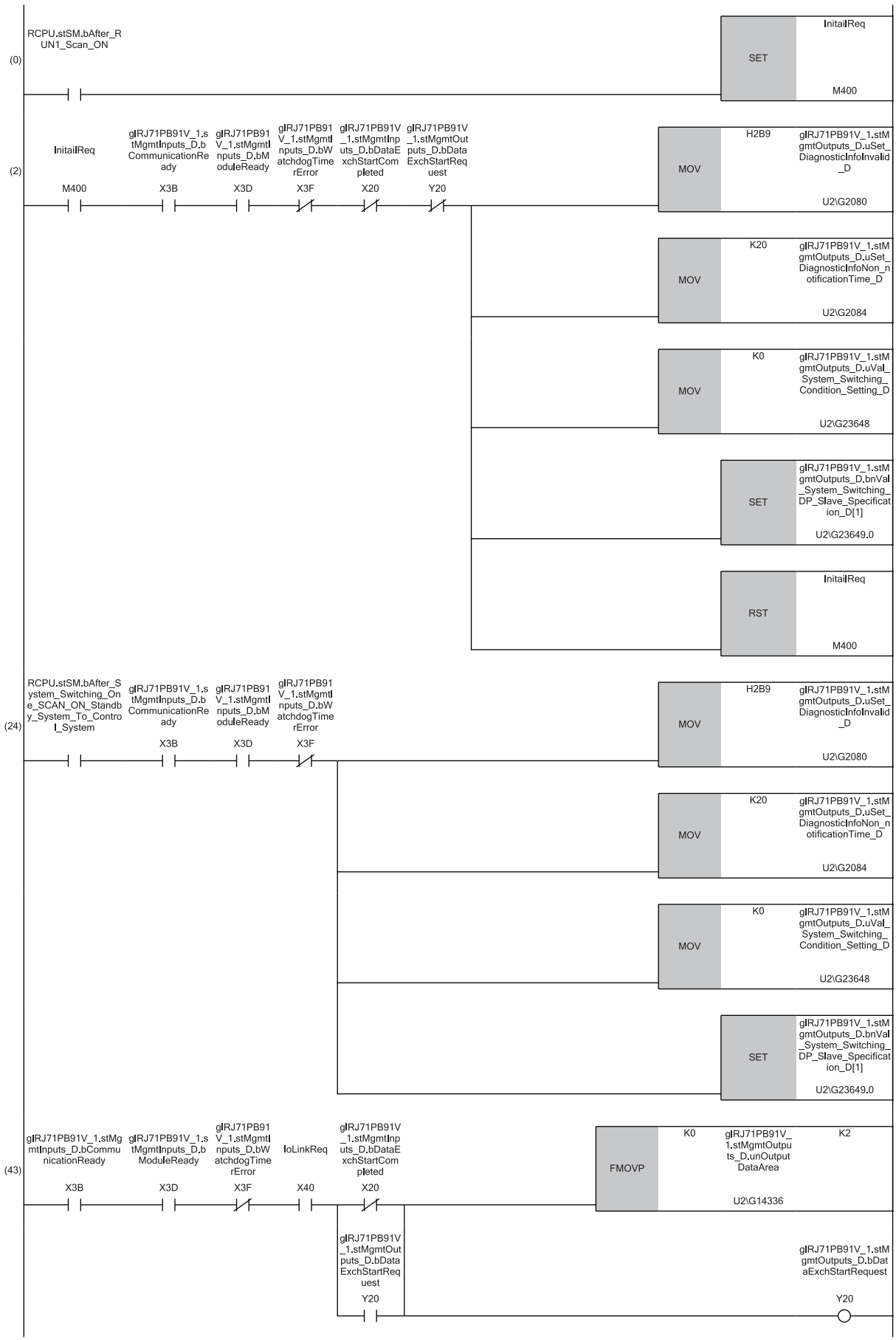
The following shows a program example that performs basic operations of the redundant system such as initial setting, initial setting within one scan after system switching, start of data exchange, and control of DP-Slave. (Refresh setting: Enabled)

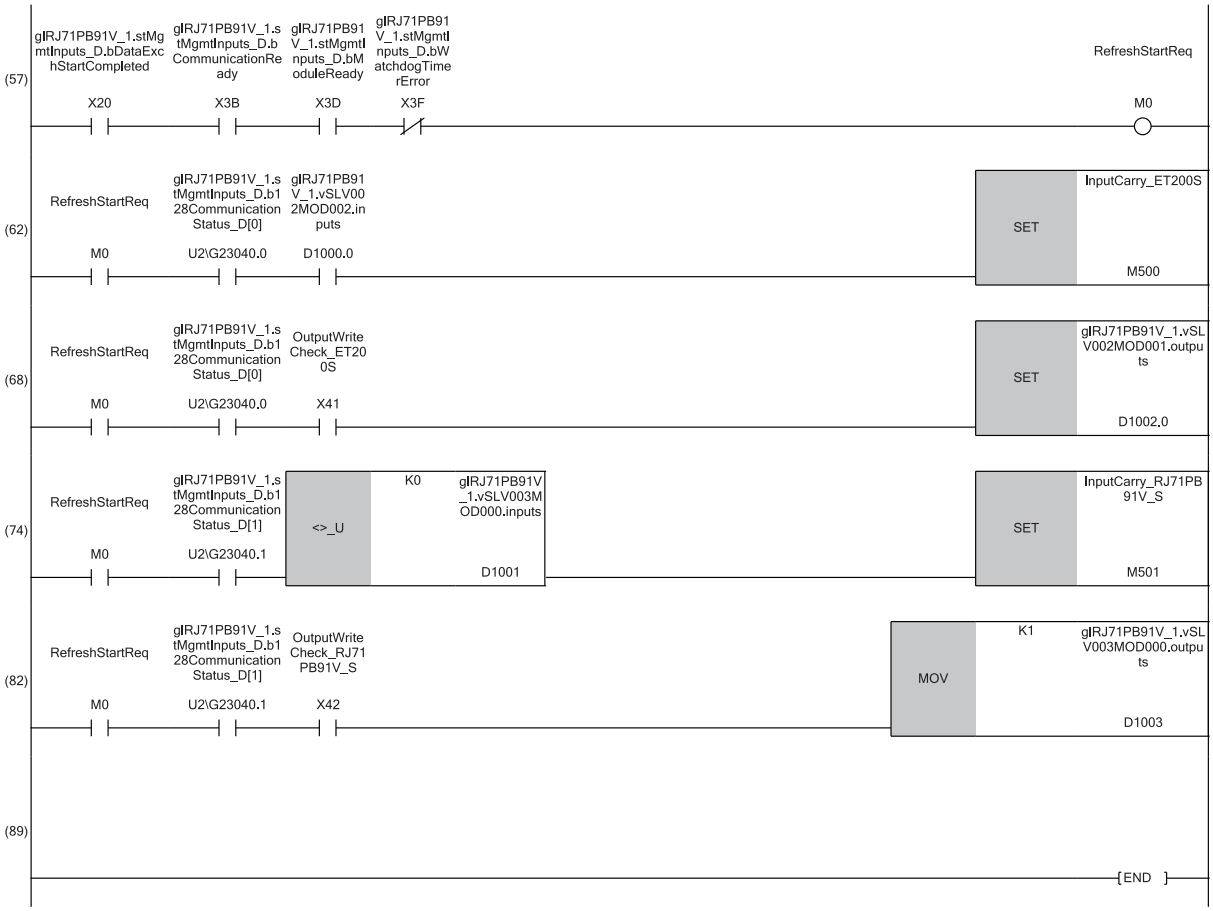
Point

Tracking transfer setting is required to keep executing functions after system switching. ☞ Page 56 I/O data exchange function

Classification	Label name	Description	Device
Global label that was updated in the RJ71PB91V	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted	Data exchange start completed signal	X20
	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady	Communication READY signal	X3B
	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady	Module ready signal	X3D
	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError	Module watchdog timer error signal	X3F
	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest	Data exchange start request signal	Y20
	glRJ71PB91V_1.vSLV002MOD001.outputs	First device output area	D1002.0
	glRJ71PB91V_1.vSLV002MOD002.inputs	First device input area	D1000.0
	glRJ71PB91V_1.vSLV003MOD000.outputs	Second device output area	D1003
	glRJ71PB91V_1.vSLV003MOD000.inputs	Second device input area	D1001
	glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoInvalid_D	Diagnostic information invalid setting area	U2\G2080
	glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoNon_notificationTime_D	Diagnostic information non-notification time setting area	U2\G2084
	glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea	Output data area (for mode 3)	U2\G14336
	glRJ71PB91V_1.stMgmtInputs_D.b128CommunicationStatus_D[0]	Slave status area (Normal communication detection) on the first device	U0\G23040.0
	glRJ71PB91V_1.stMgmtInputs_D.b128CommunicationStatus_D[1]	Slave status area (Normal communication detection) on the second device	U0\G23040.1
	glRJ71PB91V_1.stMgmtOutputs_System_Switching_Condition_Setting_D	System switching condition setting	U2\G23648
	glRJ71PB91V_1.stMgmtOutputs_System_Switching_DP_Slave_Specification_D[1]	System switching DP-Slave specification	U2\G23649
Label to be defined	Define global labels as shown below:		

	Label Name	Data Type		Class	Assign (Device/Label)
1	InitailReq	Bit	...	VAR_GLOBAL	M400
2	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
3	InputCarry_ET200S	Bit	...	VAR_GLOBAL	M500
4	IoLinkReq	Bit	...	VAR_GLOBAL	X40
5	OutputWriteCheck_ET200S	Bit	...	VAR_GLOBAL	X41
6	InputCarry_RJ71PB91V_S	Bit	...	VAR_GLOBAL	M501
7	OutputWriteCheck_RJ71PB91V_S	Bit	...	VAR_GLOBAL	X42


(0)
RCPU.stSM.bAfter_RUN1_Scan_ON
SET
InitailReq
M400
(2)
InitailReq
M400
glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady
X3B
glRJ71PB91V_1.stMgmtInputs_D.bModuleReady
X3D
glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError
X3F
glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted
X20
glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest
Y20
MOV
H2B9
glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoInvalid_D
U2\G2080
MOV
K20
glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoNon_notificationTime_D
U2\G2084
MOV
K0
glRJ71PB91V_1.stMgmtOutputs_D.uVal_System_Switching_Condition_Setting_D
U2\G23648
SET
glRJ71PB91V_1.stMgmtOutputs_D.bnVal_System_Switching_DP_Slave_Specification_D[1]
U2\G23649.0
RST
InitailReq
M400
(24)
RCPU.stSM.bAfter_System_Switching_One_SCAN_ON_Standby_System_To_Control_System
glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady
X3B
glRJ71PB91V_1.stMgmtInputs_D.bModuleReady
X3D
glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError
X3F
MOV
H2B9
glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoInvalid_D
U2\G2080
MOV
K20
glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoNon_notificationTime_D
U2\G2084
MOV
K0
glRJ71PB91V_1.stMgmtOutputs_D.uVal_System_Switching_Condition_Setting_D
U2\G23648
SET
glRJ71PB91V_1.stMgmtOutputs_D.bnVal_System_Switching_DP_Slave_Specification_D[1]
U2\G23649.0
(43)
glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady
X3B
glRJ71PB91V_1.stMgmtInputs_D.bModuleReady
X3D
glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError
X3F
IoLinkReq
X40
glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted
X20
FMOVP
K0
glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea
K2
U2\G14336
glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest
Y20
glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest
Y20



■Initial setting

(0) Turn on Initial setting execution command (M400) at startup.

(2) Set OR condition to Diagnostic information invalid setting area (U2\G2080), Diagnostic information non-notification time setting area (U2\G2084), and System switching condition setting (U2\G23648), and set the first device (ET200S) to System switching DP-Slave specification (U2\G23649).

■Initial setting within one scan after system switching

(24)Set Diagnostic information invalid setting area (U2\G2080), Diagnostic information non-notification time setting area (U2\G2084), System switching condition setting (U2\G23648), and System switching DP-Slave specification (U2\G23649) as needed when 'ON for only one scan after system switching on the new control system (standby system to control system)' (SM1643) is on. When diagnostic information non-notification time is not set except at the initial startup, 0 is set to Diagnostic information non-notification time setting area (U2\G2084).

■Start of data exchange

(43)Write output data and turn on 'Data exchange start request signal' (Y20).

(57)Turn on Refresh start request (M0).

■Control of the first DP-Slave (ET200S)

(62)Execute input processing from the 1st word (bit 0) of input data.

(68)Set output data according to the output settings of the DP-Slaves.

■Control of the second DP-Slave (RJ71PB91V)

(74)Execute input processing from the 1st word (bit 0) of input data.

(82)Set output data according to the output settings of the DP-Slaves.

5 TROUBLESHOOTING

This chapter describes troubleshooting of the RJ71PB91V.

5.1 Checking with LED

This section describes troubleshooting using the LED.
Error status can be determined by the status of the RUN LED and the ERR LED.

RUN LED	ERR LED	Error status*1	Description
Off	On, flashing	Major error	An error such as hardware failure or memory failure. The module stops operating.
On	Flashing	Moderate error	An error, such as parameter error, which affects module operation. The module stops operating.
On	On	Minor error	An error where the module continues operating.

*1 When multiple errors occur, the error status is displayed in the order of major, moderate, and minor.

When the RUN LED turns off

When the RUN LED turns off after the RJ71PB91V is powered on, check the following.

Check item	Action
Does the error continue after powering off and on?	A hardware failure may have occurred. Replace the module.
Is the RJ71PB91V mounted correctly?	Securely mount the RJ71PB91V on the base unit.
Does the mounting slot of the RJ71PB91V match with the parameter setting?	Change the mounting slot or the parameter setting.

If the above action does not solve the problem, perform the self-diagnostics test to check for hardware failure. (☞ Page 174 Offline test)

When the ERR LED turns on or is flashing

When the ERR LED turns on or is flashing, check the following item.

Check item	Action
Has any error occurred during the module diagnostics?	If an error has occurred, follow the instructions.

If the above action does not solve the problem, perform the self-diagnostics test to check for hardware failure. (☞ Page 174 Offline test)

Precautions

The ERR LED on the DP-Slave does not go off automatically even when the error cause is eliminated. For minor errors, eliminate the error cause, and click the [Clear Error] button in the "Module Diagnostics" window or turn on 'Module error reset request signal' (Y3). For moderate or major errors, reset or turn off and on the CPU module.

When the DIA LED turns on

When the DIA LED on the DP-Master turns on, check the following.

Check item	Action
Is any extended diagnostic information or alarm generated on the DP-Slave?	• Check b11 in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321). When the area is turned on, acquire extended diagnostic information from DP-Slave and take the action. When extended diagnostic is cleared, turn on 'Diagnostic information area clear request signal' (Y2). Then DIA. LED is turned off. • Check 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424). If an alarm has been generated, acquire the alarm by 'Alarm read request signal' (Y18) and take action according to the details of the alarm.

When the DIA LED on the DP-Slave turns on, check the following.

Check item	Action
Has any extended diagnostic information occurred on the DP-Slave?	Check the extended diagnostic information on the DP-Master, and take appropriate actions. To turn off the DIA LED on the DP-Slave after taking the actions, execute the notification of correction of the relevant error on the DP-Slave.

When the BF LED turns on

When the BF LED on the DP-Master turns on, check the following.

Check item	Action
Has any communication error occurred?	Check 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) and 'Local station error information area' (Un\G23071) for the error cause and follow the instruction.

When the BF LED on the DP-Slave turns on, check the following.

Check item	Action
Have I/O data exchanges started?	Start I/O data exchanges from the DP-Master. If I/O data exchanges do not start, refer to the following. ☞ Page 178 Input data cannot be sent to the DP-Master correctly
Has a communication timeout error occurred on the DP-Slave? (Check the current error or "Event History" in the "Module Diagnostics" window.)	If a communication timeout error has occurred, take actions referring to the following. ☞ Page 178 Output data sent from the DP-Master cannot be received correctly

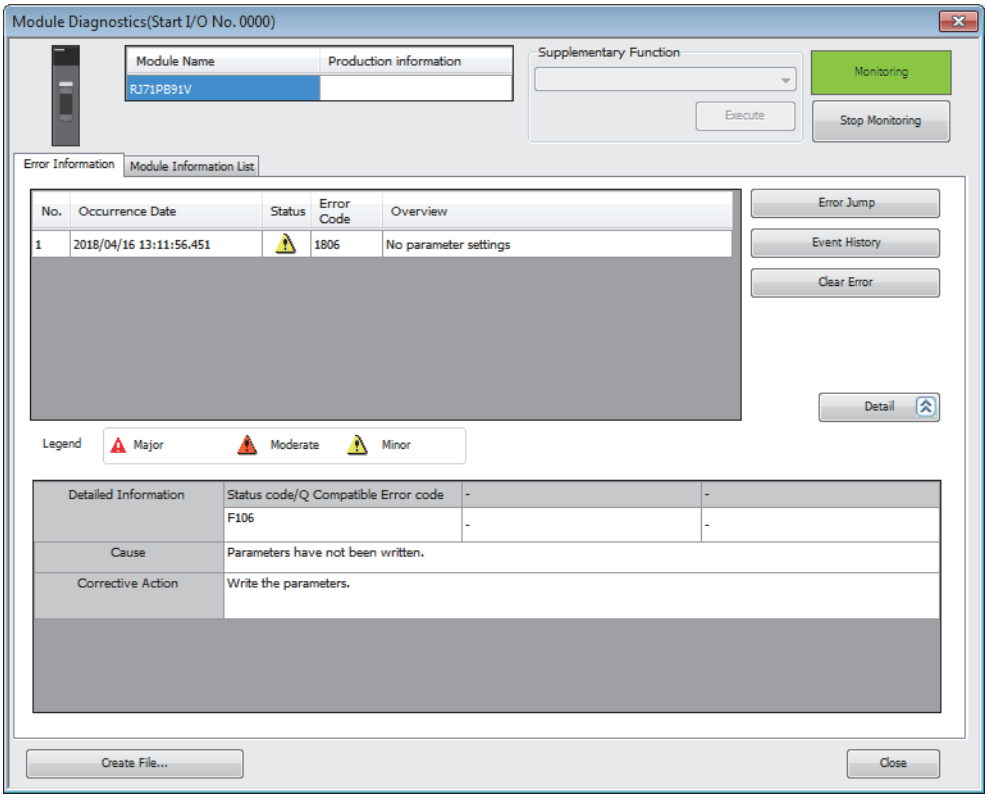
5.2 Checking the Module Status

The following functions can be used in the "Module Diagnostics" window of the RJ71PB91V.

Function	Application
Error Information	Displays the details of the errors currently occurring.
Module Information	Displays various status information of the RJ71PB91V.

Error information

Check the details on the error currently occurring and action to clear the error in [Error information] tab.

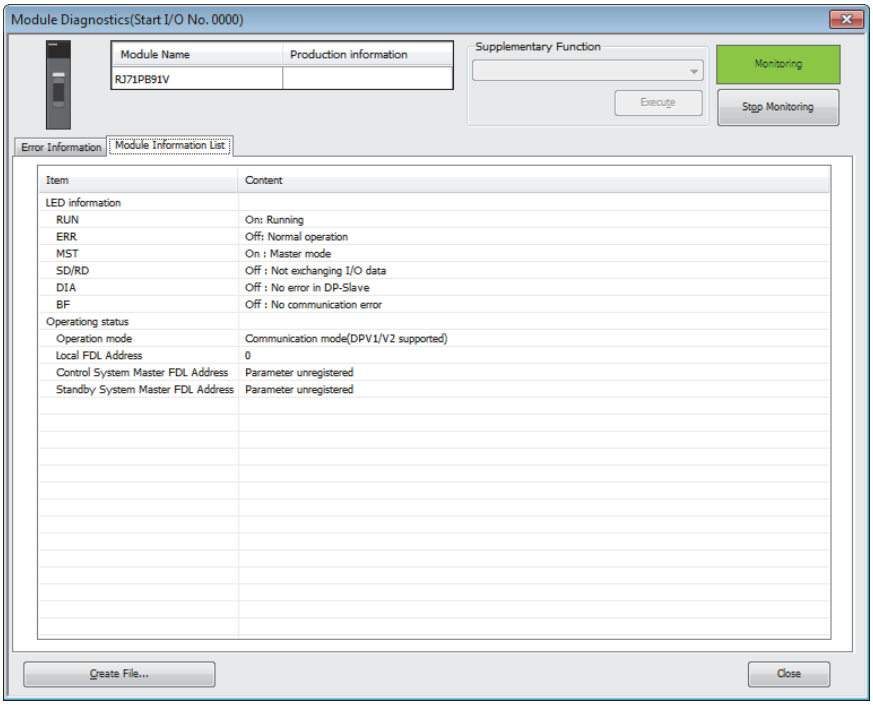


Item		Description
Status		Major: An error such as hardware failure or memory failure. The module stops operating.
		Moderate: An error, such as parameter error, which affects module operation. The module stops operating.
		Minor: An error where the module continues operating.
Error Code		The codes of the errors that have occurred on the local FDL address are displayed. (☞ Page 181 List of Error Codes)
[Error Jump] button		The RJ71PB91V does not support the error jump function.
[Event History] button		Click this button to display the event codes for checking the history of errors that have occurred on other stations when the local FDL address is used as the DP-Master, as well as for checking errors or operation history of each module. (☞ Page 194 Event List)
[Clear Error] button		The following actions are taken for minor errors (that do not cause stoppage of the module). • The ERR LED goes off. • Items displayed in "Error Status" in the "System Monitor" window are cleared. • Items displayed on the [Error Information] tab of the "Module Diagnostics" window are cleared. (The event history is not cleared.)
Detailed Information	Status code/Q Compatible Error code	Displays the following error code (maximum three) occurring. • Status code: ☞ Page 185 List of Status Codes • Q-compatibility error codes: Refer to the manual of the QJ71PB92V. (📖 PROFIBUS-DP Master Module User's Manual)
Cause		Displays the detailed error causes.
Action		Displays the actions to clear the error causes.

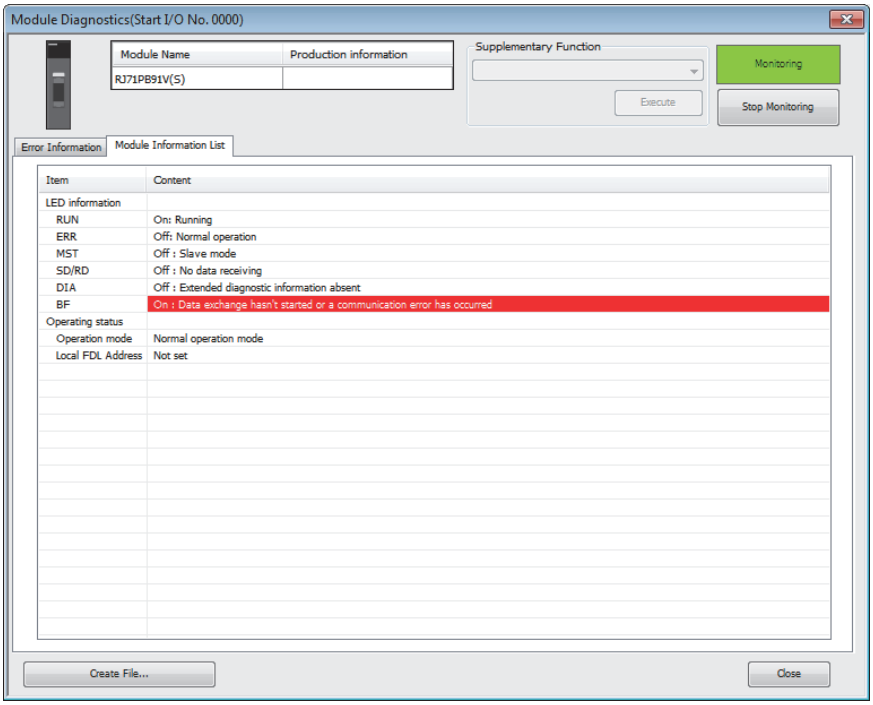
Module Information List

Switch to the [Module Information List] tab to check various status information of the RJ71PB91V.

• DP-Master



• DP-Slave



Item		Description
LED information		Displays the LED status of the RJ71PB91V.
Operating status	Operation mode	Displays operation mode currently setting.
	Local FDL Address	Displays the FDL address set in the module. The following is displayed when an FDL address is not set. • DP-Master: Parameter unregistered • DP-Slave: Not set

Offline test

There are two types of the offline test: self-diagnostics test and initialization of the flash ROM. Each type of the offline test is executed by changing the operation mode using a program. (☞ Page 45 Operation Mode Changing Function)
When the self-diagnostics test or initialization of the flash ROM is being performed or when an error is detected, the corresponding code will be stored in the following area.

- DP-Master: ☞ Page 224 Offline test status area (Un\G2258)
- DP-Slave: ☞ Page 269 Offline test status area (Un\G2258)

Reset the CPU module or power off and on the system after completed the offline test.

Restriction

Do not change the operation status of the CPU module during the offline test. If the status is changed, the module major error (2442H) occurs in the CPU module.

Self-diagnostic Test

A unit test is performed on the RJ71PB91V.

- DP-Master: ☞ Page 136 Program example for changing operation mode (self-diagnostics test)
- DP-Slave: ☞ Page 155 Program example for changing operation mode (self-diagnostics test)

Operating procedure

1. Change the operation mode to 0002H.
2. The self-diagnostics test starts automatically, and the RUN LED flashes.
3. When the self-diagnostics test has completed, LEDs on the RJ71PB91V operate as follows.
   - When completed successfully: The RUN LED turns on.
   - When completed with an error: The RUN LED turns off, and the ERR LED turns on or flashes.
4. When the test was completed with an error, check that adequate methods to reduce noise are taken for the programmable controller system, and retry the self-diagnostics test. If the result is still error completion, the hardware failure of the RJ71PB91V may have occurred. Please consult your local Mitsubishi representative.

Initialization of flash ROM

Initialization and test of the flash ROM are performed.

Operating procedure

1. Change the operation mode to 0009H.
2. Change the operation mode to 000FH.
3. Change the operation mode to 000AH.
4. Initialization of the flash ROM starts automatically, and the RUN LED flashes.
5. When the initialization of the flash ROM has completed, LEDs on the RJ71PB91V operate as follows.
   - When completed successfully: The RUN LED turns on.
   - When completed with an error: The RUN LED turns off, and the ERR LED turns on or flashes.

Point

When the CPU module is reset or the system is powered off and on after initialization of the flash ROM, the RJ71PB91V starts in the following operation mode.

- DP-Master: Parameter setting mode (mode 1)
- DP-Slave: Normal operation mode (mode 0)

5.3 Checking the Network Status

The status of the PROFIBUS-DP network can be checked from the buffer memory or PROFIBUS Configuration Tool.

Checking with the buffer memory

The PROFIBUS-DP network can be diagnosed by setting and checking the buffer memory areas on the DP-Master.

Address	Name	Description
Un\G23040 to Un\G23047	Slave status area (Normal communication detection)	Checks the normal communication detection data on each DP-Slave.
Un\G23056 to Un\G23064	Slave status area (Diagnostic information detection)	Checks the diagnostic information detection data on each DP-Slave.
Un\G23072 to Un\G23321	Diagnostic information area (for mode 3)	Checks the diagnostic information on each DP-Slave.
Un\G23328 to Un\G23454	Extended diagnostic information area (for mode 3)	Checks the details of the latest extended diagnostic information.
Un\G23456	Extended diagnostic information read request area	Sets the FDL address from which extended diagnostic information is acquired. (Use 'Extended diagnostic information read request signal' (Y6) and 'Extended diagnostic information read response signal' (X6).)
Un\G23457 to Un\G23583	Extended diagnostic information read response area	Checks acquired extended diagnostic information.

Checking with PROFIBUS Configuration Tool

Using PROFIBUS Configuration Tool, communication status of the PROFIBUS-DP network and diagnostic information from DP-Slaves can be checked on the DP-Master.

Slave Status

The communication status of the PROFIBUS-DP network can be checked. (☞ Page 99 Slave Status)

Diagnosis Messages

Diagnostic information from DP-Slaves can be checked. (☞ Page 100 Diagnosis Messages)

5.4 Troubleshooting by Symptom

Troubleshooting by symptom on DP-Master

This section describes the troubleshooting by symptom when the RJ71PB91V is used as DP-Master.

Communications with DP-Slaves fail

The following lists the actions to be taken if communications with DP-Slaves cannot be performed.

Check item	Action
Are the PROFIBUS cables wired correctly?	Check the wiring status of the PROFIBUS cables. MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup)
Is the terminal station of network connected to a bus terminator? Is the bus terminator a specified one?	Check the bus terminator and connect it. MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup)
Is the PROFIBUS-DP network configuration correct?	Check the PROFIBUS-DP network configuration. MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup)
Are all DP-Master and DP-Slaves connected to the PROFIBUS-DP network powered on?	Power on all DP-Master and DP-Slaves.
Has an error occurred to the CPU module?	Check the error of the CPU module.
Are the parameter setting details with the configuration of the DP-Slaves?	Modify and rewrite the parameters.
One or more DP-Slaves are set for I/O data exchanges.	Check the checkbox in "Slave is active" for slave parameters of each DP-Slave on the DP-Master and set one or more DP-Slaves for I/O data exchanges.
Is 'Data exchange start request signal' (Y0) of the DP-Master turned on?	Turn on 'Data exchange start request signal' (Y0).
Has an error occurred to a DP-Slave? (Has 'Diagnostic information detection signal' (X1) or the BF LED turned on?)	Check diagnostic information on the DP-Slave where the error is occurring and take action. For DP-Slaves where an error is occurring, check 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) whether bit relevant to the targets are on or not.

Communications are unstable

The following lists the actions to be taken if communications are unstable.

Check item	Action
Are three or less repeaters communicating between the RJ71PB91V and a DP-Slave?	If four or more repeaters are communicating between the RJ71PB91V and a DP-Slave, reduce the number of repeaters to three or less.
Is each segment length within the specified limit?	With any segment exceeding the specified limit, change it to a length within the limit.
Are there two bus terminators installed at both ends?	Install two bus terminators at both ends if the bus terminators are not installed there.
Is the number of connected modules in each segment within the specified limit?	If the number of connected modules in a segment is exceeding the specified limit, reduce it to the limit or less.
Is the number of segments to which devices are connected three or less?	If the number of segments to which devices are connected is exceeding three, reduce the number to three or less.
Is any error information stored in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) of the buffer memory?	Take action according to the error information.
Is any error information stored in 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454) of the buffer memory?	Take action according to the error information.

Troubleshooting by symptom on DP-Slave

This section describes the troubleshooting by symptom when the RJ71PB91V is used as DP-Slave.

Communications with DP-Master fail

The following lists the actions to be taken if communications with DP-Master cannot be performed.

Check item	Action
Are all DP-Master and DP-Slaves connected to the PROFIBUS-DP network powered on?	Power on all DP-Master and DP-Slaves.
Is the operation mode set to the normal operation mode (mode 0)? (The operation mode can be checked in the "Module Diagnostics" window or in 'Current operation mode area' (Un\G2254).)	Set the operation mode to the normal operation mode (mode 0) using the mode changing function. (☞ Page 45 Operation Mode Changing Function)
Is the correct FDL address set? (The FDL address can be checked in the "Module Diagnostics" window or in 'Operation FDL address' (Un\G513).)	Set the correct FDL address using "FDL Address" or the FDL address changing function in the engineering tool. (☞ Page 66 Module parameter, ☞ Page 48 FDL address changing function) Current module parameters can be checked by the following operation or area. • Reading parameters using the engineering tool • 'FDL address setting of module parameters display area' (Un\G518) and 'FDL address setting method of module parameters display area' (Un\G519)
Are the PROFIBUS cables wired correctly?	Check the wiring status of the PROFIBUS cables. 📖 MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup)
Are the PROFIBUS cables disconnected or short-circuited?	Replace the damaged PROFIBUS cable with a normal one.
Does the DP-Master operate normally?	• Check the error information on the DP-Master, and take appropriate actions. (📖 Manual for the DP-Master used) • When the RJ71PB91V is used as the DP-Master, check the error information in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) and 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454).
Are slave parameters set correctly on the DP-Master?	Set the slave parameters (such as FDL address and I/O configuration information) correctly on the DP-Master. (☞ Page 69 Slave parameters)

If the above action does not solve the problem, perform the self-diagnostics test to check for hardware failure. (☞ Page 174 Offline test)

Communications with DP-Master are unstable

The following lists the actions to be taken if communications with DP-Master are unstable.

Check item	Action
Are the PROFIBUS cables connected securely?	Connect the PROFIBUS cables securely to each device.
Are the PROFIBUS cables wired correctly?	Wire the PROFIBUS cables correctly. (📖 MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup))
Are the PROFIBUS cables disconnected or short-circuited?	Replace the damaged PROFIBUS cable with a normal one.
Are there three or less repeaters communicating between the DP-Master and a DP-Slave?	If four or more repeaters are communicating between the DP-Master and a DP-Slave, reduce the number of repeaters to three or less.
Is each segment length within the specified limit?	With any segment exceeding the specified limit, change it to a length within the limit. (📖 MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup))
Are there two bus terminators installed at both ends?	Install two bus terminators at both ends if the bus terminators are not installed there. (📖 MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup))
Is the number of connected modules in each segment within the specified limit?	If the number of connected modules in a segment is exceeding the specified limit, reduce it to the limit or less. (📖 MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup))
Does the DP-Master operate normally?	• Check the error information on the DP-Master, and take appropriate actions. (📖 Manual for the DP-Master used) • When the RJ71PB91V is used as the DP-Master, check the error information in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) and 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454).

If the above action does not solve the problem, perform the self-diagnostics test to check for hardware failure. (☞ Page 174 Offline test)

Input data cannot be sent to the DP-Master correctly

The following lists the actions to be taken if input data cannot be exchanged with the DP-Master. Refer to the following if not only input data but also output data cannot be exchanged with the DP-Master.

☞ Page 177 Communications with DP-Master fail,Page 177 Communications with DP-Master are unstable

Check item	Action
Have I/O data exchanges started? (Does 'Data exchanging signal' (X1) on the DP-Slave turn on?)	The I/O data exchange start request is not sent from the DP-Master. Check that the DP-Master performs communications correctly.
Is the refresh executed in 'Input send area' (Un\G256 to Un\G447) on the DP-Slave? (Is 'Input send area refresh instruction signal' (Y0) turned on?)	Turn on 'Input send area refresh instruction signal' (Y0).
Is 'Input data area (for mode 3)' (Un\G6144 to Un\G10239) on the DP-Master updated according to the input data when 'During FREEZE mode signal' (X7) on the DP-Slave turns on?	The DP-Slave is in the FREEZE mode. Perform any of the following operations. • Execute the FREEZE service periodically from the DP-Master. • Execute the UNFREEZE service from the DP-Master to exit the FREEZE mode.
Is the destination of input data set correctly in 'Input send area' (Un\G256 to Un\G447) on the DP-Slave?	Check 'Use status of input send area' (Un\G2288 to Un\G2299) on the DP-Slave, and change the destination of input data (device, buffer memory, or module label) using a program.
Are upper and lower bytes reversed between the input data written to 'Input send area' (Un\G256 to Un\G447) on the DP-Slave and the input data received by the DP-Master?	The data swap function is not set properly in the slave parameters on the DP-Master. Take the following actions. • Check that the data swap function is set correctly in 'Data swap function setting status' (Un\G2259) on the DP-Slave. • Set "Swap I/O Bytes in Master" in the "Slave Settings" window in PROFIBUS Configuration Tool correctly on the DP-Master.
Is the refresh executed in 'Input send area' (Un\G256 to Un\G447) when "Data Consistency" is enabled in the module parameters on the DP-Slave?	To write data to 'Input send area' (Un\G256 to Un\G447) when the data consistency function is enabled on the DP-Slave, use the refresh function. Perform any of the following operations. • Enable "Data Consistency" in the module parameters, and set the refresh target in "Input Send Area" of "Refresh Setting". • Set "Disable" to "Data Consistency" in the module parameters.
Is input data written to 'Input send area' (Un\G256 to Un\G447) by the MOV instruction or the TO instruction when "Data Consistency" is enabled and "Input Send Area" is set in "Refresh Setting" in the module parameters on the DP-Slave?	To write data to 'Input send area' (Un\G256 to Un\G447) when the data consistency function is enabled on the DP-Slave, use the refresh function. Do not use the MOV instruction or the TO instruction of a program.
Are slave parameters set correctly on the DP-Master?	Set the slave parameters (such as FDL address and I/O configuration information) correctly on the DP-Master.

Output data sent from the DP-Master cannot be received correctly

Check the following items if output data cannot be exchanged correctly with the DP-Master. Refer to the following if not only output data but also input data cannot be exchanged correctly.

☞ Page 177 Communications with DP-Master fail,Page 177 Communications with DP-Master are unstable

Check item	Action
Have I/O data exchanges started? (Does 'Data exchanging signal' (X1) on the DP-Slave turn on?)	The I/O data exchange start request is not sent from the DP-Master. Check that the DP-Master performs communications correctly.
Is 'Output data area (for mode 3)' (Un\G14336 to Un\G18431) on the DP-Master updated according to the output data when 'During SYNC mode signal' (X5) on the DP-Slave turns on?	The DP-Slave is in the SYNC mode. Perform any of the following operations. • Execute the SYNC service periodically from the DP-Master. • Execute the UNSYNC service from the DP-Master to exit the SYNC mode.
Is 'SYNC receive signal' (X6) of the DP-Slave inverted when the SYNC service is sent from the DP-Master during the SYNC mode (while 'During SYNC mode signal' (X5) is on)?	When the sequence scan time is longer than the bus cycle time, 'SYNC receive signal' (X6) may not be inverted even when the SYNC service is received. In this case, do not use 'SYNC receive signal' (X6) as a trigger of receive processing. Execute the receive processing for each scan. (It is because the on/off status of X6 signal is inverted again and reset to the previous state when the SYNC service is received an even number of times during sequence scan.)
Is the output data read from the correct position in 'Output receive area' (Un\G0 to Un\G191) on the DP-Slave?	Check 'Use status of output receive area' (Un\G2272 to Un\G2283) on the DP-Slave, and change the position from which the output data is read (device, buffer memory, or module label) using a program.
Are upper and lower bytes reversed between the output data sent from the DP-Master and the output data read from 'Output receive area' (Un\G0 to Un\G191) on the DP-Slave?	The data swap function is not set properly in the slave parameters on the DP-Master. Take the following actions. • Check that the data swap function is set correctly in 'Data swap function setting status' (Un\G2259) on the DP-Slave. • Set "Swap I/O Bytes in Master" in the "Slave Settings" window in PROFIBUS Configuration Tool correctly on the DP-Master.

Check item	Action
Is the refresh executed in 'Output receive area' (Un\G0 to Un\G191) when "Data Consistency" is enabled in the module parameters on the DP-Slave?	To read data from 'Output receive area' (Un\G0 to Un\G191) when the data consistency function is enabled on the DP-Slave, use the refresh function. Perform any of the following operations. • Set "Enable" the "Data Consistency" in the module parameters, and set the refresh target in "Output receive area" of "Refresh Setting". • Set "Disable" to "Data Consistency" in the module parameters.
Is output data read from 'Output receive area' (Un\G0 to Un\G191) by the MOV instruction or the FROM instruction when "Data Consistency" is enabled and "Output receive area" is set in "Refresh Setting" in the module parameters on the DP-Slave?	To read data from 'Output receive area' (Un\G0 to Un\G191) when the data consistency function is enabled on the DP-Slave, use the refresh function. Do not use the MOV instruction or the FROM instruction of a program.
Are slave parameters set correctly on the DP-Master?	Set the slave parameters (such as FDL address and I/O configuration information) correctly on the DP-Master.

Others

Check the following items.

Check item	Action
Consistency of I/O data is not maintained.	• Set "Data Consistency" to "Enable (Use Autorefresh)" in the module parameters on the DP-Master. • Set "Data Consistency" to "Enable" in the module parameters on the DP-Slave. • To exchange data between the CPU module and the RJ71PB91V when the data consistency function is enabled, use the refresh function. Do not use the MOV instruction or the FROM/TO instruction of a program.
Extended diagnostic information notification is not issued.	• Check that 'Data exchanging signal' (X1) on the DP-Slave is on. 'Extended diagnostic information notification request signal' (Y2) is ignored while 'Data exchanging signal' (X1) is off. • Set the interlock so that the extended diagnostic information notification request is issued only while 'Data exchanging signal' (X1) on the DP-Slave is on. (☞ Page 209 Extended diagnostic information notification signals (X2) and (Y2))
FDL address cannot be changed from DP-Master (Class 2).	Check 'FDL address change availability status area' (Un\G517) to see whether the FDL address can be changed or not, and perform any of the following operations. (☞ Page 48 FDL address changing function) • Change "Setting Method Of FDL Address" in the module parameters on the DP-Slave. • Execute the FDL address clear from a program.
A communication timeout error is not detected when the DP-Master goes down. ('Data exchanging signal' (X1) on the DP-Slave does not turn off.)	• Check that the communication watchdog timer is set and that the specified time is not too long. • After I/O data exchanges have started, check that the communication watchdog timer value set on the DP-Master is reflected correctly in 'Current communication watchdog timer value' (Un\G2257) on the DP-Slave.
A communication timeout error occurs.	• Check that the communication watchdog timer setting on the DP-Master is not too short. • After I/O data exchanges have started, check that the communication watchdog timer value set on the DP-Master is reflected correctly in 'Current communication watchdog timer value' (Un\G2257) on the DP-Slave.

If the above action does not solve the problem, perform the self-diagnostics test to check for hardware failure. (☞ Page 174 Offline test)

Troubleshooting by symptom in the redundant system

This section describes the troubleshooting by symptom when the RJ71PB91V is used as the redundant system.

Communications with DP-Slaves fail

The following lists the actions to be taken if communications with DP-Slaves cannot be performed.

Check item	Action
Are the PROFIBUS cables wired correctly?	Check the wiring status of the PROFIBUS cables. MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup)
Is the terminal station of network connected to a bus terminator? Is the bus terminator a specified one?	Check the bus terminator and connect it. MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup)
Is the PROFIBUS-DP network configuration correct?	Check the PROFIBUS-DP network configuration. MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup)
Are all DP-Master and DP-Slaves connected to the PROFIBUS-DP network powered on?	Power on all DP-Master and DP-Slaves.
Has an error occurred to the CPU module?	Check the error of the CPU module.
Are the parameter setting details with the configuration of the DP-Slaves?	Modify and rewrite the parameters.
Are one or more DP-Slaves set for I/O data exchanges?	Check the checkbox in "Slave is active" for slave parameters of each DP-Slave on the DP-Master and set one or more DP-Slaves for I/O data exchanges.
Is 'Data exchange start request signal' (Y0) of the DP-Master turned on?	Turn on 'Data exchange start request signal' (Y0).
Is 'Data exchange start request signal' (Y0) of the DP-Master on the standby system turned on?	Turn on 'Data exchange start request signal' (Y0) of the DP-Master on the control system. The DP-Master of the standby system cannot be communicated with DP-Slaves.
Has an error occurred to a DP-Slave? (Has 'Diagnostic information detection signal' (X1) or the BF LED turned on?)	Check diagnostic information on the DP-Slave where the error is occurring and take action. For DP-Slaves where an error is occurring, check 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) whether bit relevant to the targets are on or not.

Output is turned off during system switching

If output is turned off or turned off for a moment during system switching, check the following items.

Check item	Action
Is the communication watchdog timer value of a DP-Slave small?	Check that the communication watchdog timer value of a DP-Slave satisfies the calculation formula. (☞ Page 52 Communication watchdog timer value)
Are the PROFIBUS cables wired correctly?	Check the wiring status of the PROFIBUS cables. (MELSEC iQ-R PROFIBUS-DP Module User's Manual (Startup))
Are a start-up contact of a program and an output device specified in the tracking transfer setting?	Check that a start-up contact of a program and an output device are specified in "Tracking Setting" in the "CPU Parameter" window of the engineering tool. (MELSEC iQ-R CPU Module User's Manual (Application))
Is output data (tracking data) set to the output area using a program within one scan after system switching?	Check that output data is set to 'Output data area (for mode 3)' (Un\G14336 to Un\G18431) using a program within one scan after system switching.

Parameters are not written completely

If parameters are not written completely, check the following item.

Check item	Action
Has the monitor stopped before writing parameters?	Restart a personal computer and check that the monitor stops. Then, rewrite the parameters. (☞ Page 63 Writing parameters)

5.5 List of Error Codes

This section lists the error codes that result from the processing for data exchange between the DP-Master and DP-Slaves or the processing requests from the CPU module on the local FDL address.
Error codes are classified into major error, moderate error, and minor error. These error code can be checked in the [Error Information] tab of the "Module Diagnostics" window of the RJ71PB91V. (☞ Page 172 Error information)

Point

The following codes corresponding to the error that occurred are displayed in "Status Code/Q Compatible Error Code" on "Detailed information" of the [Error information] tab.

- Status code: ☞ Page 185 List of Status Codes
- Q-compatibility error codes: Refer to the manual of the QJ71PB92V. (📖 PROFIBUS-DP Master Module User's Manual)

Error code	LED status	Error details and cause	Action	Station type
1800H	ERR on	A DP-Slave which is duplicated the FDL address with a DP-Master exists in the parameter.	Check the FDL addresses for the DP-Master and DP-Slave and then configure the parameters with the different FDL addresses.	DP-Master
1801H	ERR on	Even one DP-Slave is not set for I/O data exchanges.	Check the following items to perform I/O data exchanges at least one DP-Slave. • Are "Slave is active" of the slave parameters checked? • Are all the DP-Slaves not switched into temporarily reserved stations with the temporarily reserved station specification function?	DP-Master
1806H	ERR on	The parameters have not been written.	Rewrite the parameters.	DP-Master
180CH	ERR on	The parameters contain a DP-Slave with the I/O data size set to 0 byte.	Check the slave parameters and set the I/O data sizes of each DP-Slave to one byte or more.	DP-Master
1810H	ERR on	The data consistency function is set to "Enable", but the refresh setting is disabled.	Enable the refresh setting when the data consistency function is set to "Enable". Reset the refresh settings and data consistency settings and rewrite the parameters.	DP-Master
1811H	ERR on	A hardware failure has been detected.	Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master
18C0H	ERR on	FDL address stored in the module is corrupted.	• Set the FDL address again by performing the FDL address change (saved to the flash ROM) using 'FDL address change request signal' (Y13). • Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative. • Change "Setting Method Of FDL Address" in the module parameters, and set the FDL address using "FDL address" in the module parameters.	DP-Slave
18C1H	ERR on	The FDL address to be set is out of the setting range.	Change the FDL address within the setting range.	DP-Slave
18C5H	ERR on	Change of the FDL address is requested while the change of the FDL address is prohibited.	Clear the FDL address using 'FDL address change request signal' (Y13).	DP-Slave
18C6H	ERR on	Change of the FDL address is requested when the FDL address is set in the module parameters.	• Set the FDL address (not saved to the flash ROM) to change it using 'FDL address change request signal' (Y13). • Set the FDL address using "FDL Address" in the module parameters. • Change "Setting Method Of FDL Address" in the module parameters, and request the change of the FDL address again.	DP-Slave
18C7H	ERR on	Change of the FDL address is requested when 'Count of rewriting FDL address in the flash ROM' (Un\G516) is 0.	• Clear the FDL address using 'FDL address change request signal' (Y13). • Reset or turn off and on the CPU module.	DP-Slave
18D1H	ERR on	The communication watchdog timer value is too long.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Slave watchdog" in the "Master Settings" window in PROFIBUS Configuration Tool.	DP-Slave

Error code	LED status	Error details and cause	Action	Station type
18D2H	ERR on	Minimum response time (min T_sdr) is out of the setting range.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "min T_sdr" in the "Slave Settings" window in PROFIBUS Configuration Tool.	DP-Slave
18D3H	ERR on	Data length in the user parameters is invalid.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Module Parameters" in the "Slave User Parameters" window in PROFIBUS Configuration Tool.	DP-Slave
18D5H	ERR on	Data format of I/O configuration information is set to other than word.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Project Slave Modules" in the "Slave Modules" window in PROFIBUS Configuration Tool.	DP-Slave
18D6H	ERR on	Data swap function setting is out of the setting range.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Word Data Swap" in "Module Parameters" in the "Slave User Parameters" window in PROFIBUS Configuration Tool.	DP-Slave
18D7H	ERR on	Data assignment mode setting is out of the setting range.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Data Alignment Mode" in "Module Parameters" in the "Slave User Parameters" window in PROFIBUS Configuration Tool.	DP-Slave
18D9H	ERR on	Data module type set in I/O configuration information is out of the setting range.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Project Slave Modules" in the "Slave Modules" window in PROFIBUS Configuration Tool.	DP-Slave
18E0H	ERR on	Communication watchdog timer has timed out during I/O data exchanges with the DP-Master.	• Check the status of the DP-Master. • Check the connection status of the cables. • Set the communication watchdog timer longer on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Slave watchdog" in the "Master Settings" window in PROFIBUS Configuration Tool.	DP-Slave
1D00H	ERR on	The FDL address of the DP-Master of the standby system is out of the setting range.	Check the following items and reset the parameters. • "Redundant System Settings" of the "Module Parameter" window of the engineering tool. • "Standby System Master FDL Address" of the "Module Parameter" window of the engineering tool.	DP-Master
1D01H	ERR on	The DP-Masters of the control system and the standby system have the same FDL address.	Check the following items and set the parameters so that the DP-Masters of the control system and the standby system have different FDL addresses. • "Standby System Master FDL Address" of the "Module Parameter" window of the engineering tool. • "FDL address" of the "Master Settings" window of PROFIBUS Configuration Tool	DP-Master
1D02H	ERR on	The DP-Master and the DP-Slaves of the standby system have the same FDL address.	Check the following items and set the parameters so that the DP-Master and the DP-Slaves of the standby system have different FDL addresses. • "Standby System Master FDL Address" of the "Module Parameter" window of the engineering tool. • "FDL Address" of the "Slave Settings" window of PROFIBUS Configuration Tool	DP-Master
2242H	ERR flashing	An invalid value is set in the module parameters.	• Change the relevant parameter settings. • Match the versions between the module set in the project of the engineering tool and the mounted module. • If the same error occurs again even after the above action is taken, the data memory of the CPU module, the memory card, or the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Slave
2250H	ERR flashing	An extended parameter error has been detected.	• Write the extended parameters to the CPU module. • Check the extended parameter settings and rewrite the extended parameters to the CPU module. • If the error continues to occur after writing the extended parameters to the CPU module, replace the module.	DP-Master
3500H	ERR flashing	Parameters for a redundant system are not set.	Check the following items and reset the parameters. • "Redundant System Settings" of the "Module Parameter" window of the engineering tool. • "Standby System Master FDL Address" of the "Module Parameter" window of the engineering tool.	DP-Master

Error code	LED status	Error details and cause	Action	Station type
3C00H	ERR flashing	A hardware failure has been detected.	Take measures to reduce noise, reset the CPU module or turn off and on the system, and execute RUN. If the same error occurs again even after the above action is taken, the module, base unit, or extension cable may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master DP-Slave
3C01H to 3C03H	ERR flashing	A hardware failure has been detected.	Take measures to reduce noise, reset the CPU module or turn off and on the system, and execute RUN. If the same error occurs again even after the above action is taken, the module, base unit, or extension cable may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Slave
3E02H to 3E05H	ERR flashing	A hardware failure has been detected.	Replace the CPU module or the module. If the error recurs, please consult your local Mitsubishi representative.	DP-Master
3E07H	ERR flashing	A hardware failure has been detected.	Initialize the flash ROM. If the error recurs, replace the module.	DP-Master
3E08H	ERR flashing	A hardware failure has been detected.	Initialize the flash ROM. If the error recurs, replace the module.	DP-Master
3E0BH	ERR flashing	A hardware failure has been detected.	Initialize the flash ROM. If the error recurs, replace the module.	DP-Master
3E0DH	ERR flashing	Out of range parameter data are written.	Initialize the flash ROM. If the error recurs, please consult your local Mitsubishi representative.	DP-Master
3E0FH	ERR flashing	A hardware failure has been detected.	Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master
3E1E	ERR flashing	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	DP-Master
3E1F	ERR flashing	A hardware failure has been detected.	Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master
3E21H to 3E24H	ERR flashing	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	DP-Master
3E25H	ERR flashing	• The operation mode change processing has stopped due to a line error. • A hardware failure has been detected.	• Check the wiring of bus terminators and PROFIBUS cables. • If the error recurs, please consult your local Mitsubishi representative.	DP-Master
3E42H	ERR flashing	• While the INITIATE (Class2) service was being executed, a transmission timeout occurred. • A hardware failure has been detected.	• Set the transmission timeout setting value for the INITIATE (Class 2) service in line with the DP-Slaves. (📖 Manual for the DP-Slave) • Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master
3E61H	ERR flashing	A hardware failure has been detected.	Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master
3E80H	ERR flashing	The ROM check test failed.	Please consult your local Mitsubishi representative.	DP-Master DP-Slave
3E81H	ERR flashing	The timer test failed.	Please consult your local Mitsubishi representative.	DP-Master DP-Slave
3E82H	ERR flashing	The MPU test failed.	Please consult your local Mitsubishi representative.	DP-Master DP-Slave
3E83H	ERR flashing	The RAM test failed.	Please consult your local Mitsubishi representative.	DP-Master DP-Slave
3E84H	ERR flashing	The 2-port RAM test failed.	When executing the self-diagnostic test, disable the refresh settings and stop writing to the buffer memory. If the error recurs, please consult your local Mitsubishi representative.	DP-Master DP-Slave
3E85H	ERR flashing	The swap port test failed.	Please consult your local Mitsubishi representative.	DP-Master DP-Slave
3E87H	ERR flashing	Initialization of the flash ROM failed.	Initialize the flash ROM. If the error recurs, replace the module.	DP-Master DP-Slave

Error code	LED status	Error details and cause	Action	Station type
3EA3H	ERR flashing	An error occurred while system switching (from the DP-Master of the control system to the DP-Master of the new standby system) was being executed.	Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master
3EA4H	ERR flashing	An error occurred while system switching (from the DP-Master of the standby system to the DP-Master of the new control system) was being executed.	• Check the wiring of bus terminators and PROFIBUS cables. When the bus terminators and PROFIBUS cables are wired correctly, increase setting value "Min. slave interval" of the master parameters. • Check that the DP-Master of the control system has a different FDL address from the other DP-Masters in the multi-master system configuration. • Reset the CPU module or power off and on the system. And then set the CPU module to RUN state. If the same error occurs again even after the above action is taken, the module may have a hardware failure. Please consult your local Mitsubishi representative.	DP-Master

5.6 List of Status Codes

Status codes can be checked using the buffer memory.

The BF LED turns on if a status code is applicable to a DP-Slave error that occurred during I/O data exchanges.

Classification of status codes and their storage areas are as follows.

Status code	Classification	Reference storage area	Station type
1001H to 4001H	Local diagnostic information of the RJ71PB91V	Page 267 Module error information (Un\G2040)	DP-Slave
8001H to 8007H	Offline test		DP-Slave
E200H to E2FFH	Status codes generated when extended diagnostic information is acquired.	Page 235 Extended diagnostic information read response area (Un\G23457 to Un\G23583)	DP-Master
E300H to E3FFH	Status codes generated when operation mode switching is executed.	Page 223 Operation mode change result area (Un\G2256)	DP-Master
E400H to E4FFH	Status codes generated when acyclic communication function is executed	Page 244 Acyclic communication response area (Un\G25121 to Un\G26144)	DP-Master
E500H to E5FFH	Status codes generated when alarms are acquired.	Page 251 Alarm response area (Un\G26446 to Un\G26768)	DP-Master
E600H to E6FFH	Status codes generated when time control is executed.	Page 261 Time control setting response area (Un\G26800 to Un\G26812)	DP-Master
F100H to FBFFH	Local diagnostic information of the RJ71PB91V	Page 231 Local station error information area (Un\G23071)	DP-Master

Status code	Error details and cause	Action
1001H	The FDL address saved to the flash ROM is out of the setting range.	Set the FDL address within the setting range.
1002H	The FDL address to be set is out of the setting range.	Set the FDL address within the setting range.
1006H	'FDL address change request signal' (Y13) is turned on while the change of FDL address is prohibited (by setting "No_Add_Chg" to "TRUE" from the DP-Master (Class 2)).	Clear the FDL address using 'FDL address change request signal' (Y13).
1007H	Change of the FDL address is requested when the FDL address is set in the parameters.	• Set the FDL address (not saved to the flash ROM) to change it using 'FDL address change request signal' (Y13). • Set the FDL address using "FDL Address" in the module parameters. • Change "Setting Method Of FDL Address" in the module parameters, and request the change of the FDL address again.
2001H	Change of the FDL address is requested when 'Count of rewriting FDL address in the flash ROM' (Un\G516) is 0.	• Clear the FDL address using 'FDL address change request signal' (Y13). • Reset the CPU module or power off and on the system.
2002H	A hardware failure has been detected.	Take measures to reduce noise, reset the CPU module or turn off and on the system, and execute RUN. If the same error occurs again even after the above action is taken, the module, base unit, or extension cable may have a hardware failure. Please consult your local Mitsubishi representative.
2003H	A hardware failure has been detected.	Take measures to reduce noise, reset the CPU module or turn off and on the system, and execute RUN. If the same error occurs again even after the above action is taken, the module, base unit, or extension cable may have a hardware failure. Please consult your local Mitsubishi representative.
3002H	The communication watchdog timer value is too long.	On the DP-Master, check "Slave watchdog" in the "Master Settings" window in PROFIBUS Configuration Tool.
3003H	Minimum response time (min T_sdr) is out of the setting range.	On the DP-Master, check "min T_sdr" in the "Slave Settings" window in PROFIBUS Configuration Tool.
3004H	Data length in the user parameters is invalid.	• Check the relevant slave parameters on the DP-Master. • When the RJ71PB91V is used as the DP-Master, check "Module Parameters" in the "Slave User Parameters" window in PROFIBUS Configuration Tool.

Status code	Error details and cause	Action
3006H	A hardware failure has been detected.	Take measures to reduce noise, reset the CPU module or turn off and on the system, and execute RUN. If the same error occurs again even after the above action is taken, the module, base unit, or extension cable may have a hardware failure. Please consult your local Mitsubishi representative.
3007H	Communication watchdog timer has timed out during I/O data exchanges with the DP-Master.	• Check the status of the DP-Master. • Check the connection status of the cables. • On the DP-Master, check "Slave watchdog" in the "Master Settings" window in PROFIBUS Configuration Tool.
3061H	Data format of I/O configuration information is set to other than word.	On the DP-Master, check "Project Slave Modules" in the "Slave Modules" window in PROFIBUS Configuration Tool.
3062H	Data swap function setting is out of the setting range.	On the DP-Master, check "Word Data Swap" in "Module Parameters" in the "Slave User Parameters" window in PROFIBUS Configuration Tool.
3063H	Data assignment mode setting is out of the setting range.	On the DP-Master, check "Data Alignment Mode" in "Module Parameters" in the "Slave User Parameters" window in PROFIBUS Configuration Tool.
3065H	Data module type set in I/O configuration information is out of the setting range.	On the DP-Master, check "Project Slave Modules" in the "Slave Modules" window in PROFIBUS Configuration Tool.
4001H	Data length of extended diagnostic information is invalid.	Set the data length in 'Extended diagnostic information area' (Un\G2041 to Un\G2053) within the range between 0 and 24 bytes.
8001H	The ROM check test failed.	Please consult your local Mitsubishi representative.
8002H	The timer test failed.	Please consult your local Mitsubishi representative.
8004H	The MPU test failed.	Please consult your local Mitsubishi representative.
8005H	The RAM test failed.	Please consult your local Mitsubishi representative.
8006H	The 2-port RAM test failed.	When executing the self-diagnostic test, disable the refresh settings and stop writing to the buffer memory. If the error recurs, please consult your local Mitsubishi representative.
8007H	The swap port test failed.	Please consult your local Mitsubishi representative.
80FFH	Initialization of the flash ROM failed.	Initialize the flash ROM. If the error recurs, replace the module.
E200H	Specified FDL address out of range	Check the specified FDL address and retry.
E201H	The specified FDL address is not set.	Check the specified FDL address and retry.
E202H	The specified FDL address is overlapped with local FDL address (the DP-Master)	Check the specified FDL address and retry.
E203H	The specified FDL address is for a reserved station or temporarily reserved station.	Check the specified FDL address and retry.
E204H	No extended diagnostic information for the specified FDL address.	Check the specified FDL address and retry.
E205H	'Extended diagnostic information read request' (Y6) cannot be executed in operation mode.	Set the communication mode (mode 3) from operation mode and retry.
E300H	Specified mode out of range	Check the operation mode set in 'Operation mode change request area' (Un\G2255) and retry.
E301H	The parameters have not been written to the module.	Write the parameters and switch the mode to communication mode (mode 3).
E302H	Operation mode cannot be changed in the current operating status.	When the following processing is completed, change operation modes. • Acquisition of extended diagnostic information • Global control function • Acyclic communication function • Alarm acquisition function • Time control over DP-Slaves
E304H	Invalid flash ROM clear mode processing	Initialize the flash ROM. If the error recurs, please consult your local Mitsubishi representative.
E305H	Specified mode out of range	Check the operation mode set in 'Operation mode change request area' (Un\G2255) and retry.
E306H	The operation mode was changed while a Class 2 service for the acyclic communication function was executed.	Execute ABORT before changing operation modes.
E307H	In a redundant system, the operation mode of the RJ71PB91V cannot be changed with the current operation mode of the CPU module.	Change the operation mode of the RJ71PB91V after setting the CPU module to the separate mode.
E400H	Target FDL address of DP-Slave out of range	Check the specified FDL address and retry.

Status code	Error details and cause	Action
E401H	The FDL address of the target DP-Slave is overlapped with local FDL address (the DP-Master)	Check the specified FDL address and retry.
E402H	Invalid read data length	Check the specified read data length and retry.
E403H	Read exception response	Check detailed status codes 1 to 3 and take action.
E404H	Invalid slot number	Check the specified slot number and retry.
E405H	Invalid index	Check the specified index and retry.
E406H	Invalid CommRef number	Check the specified CommRef number and FDL address are correct and retry.
E407H	A Class 1 service for the acyclic communication function was executed while I/O data exchanges were stopped.	Turn on 'Data exchange start request signal' (Y0) and start I/O data exchanges. Check 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) for whether the bits relevant to the targets are on and retry.
E410H	• A physical execution error was detected. • System switching was executed while a service was being executed in the redundant system.	Check detailed status codes 2 to 3 and take action. Check 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) for whether the bits relevant to the targets are on and retry.
E411H	A protocol related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E412H	An application related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E420H	The DP-Slave detected a read error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E421H	The DP-Slave detected a write error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E422H	The DP-Slave detected a module error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E423H	The DP-Slave cannot handle the data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E424H	The DP-Slave detected an application error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E425H	The DP-Slave detected an unsupported request error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E426H	The DP-Slave detected an invalid index.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E427H	The DP-Slave detected an invalid specified data length.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E428H	The DP-Slave detected an invalid slot number.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E429H	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E42AH	The DP-Slave attempted to access an inaccessible area.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E42BH	The DP-Slave cannot access data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E42CH	The DP-Slave rejected access.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E42DH	The DP-Slave detected an invalid access range.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E42EH	The DP-Slave detected an invalid request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E42FH	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E430H	The DP-Slave detected an invalid parameter in the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E431H	The DP-Slave detected an abnormal resource during the reading processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E432H	The DP-Slave detected an abnormal resource during the writing processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E433H	The DP-Slave is already using the resource.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E434H	No resource is available to the DP-Slave.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)

Status code	Error details and cause	Action
E435H	A service unavailable for the specified DP-Slave was requested.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E436H	The DP-Slave does not have sufficient memory to process the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E437H	The DP-Slave invalidated the service.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E438H	The DP-Slave did not respond to the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E439H	• The DP-Slave did not respond to the request. • Request is executed while other function is operating.	• Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave) • When the acyclic communication function is executed successively to the same DP-Slave, adjust the execution interval and retry. (Manual for each DP-Slave) • Check whether the interlock between the global control function and time control of DP-Slaves is correct and retry.
E440H	Target FDL address of DP-Slave out of range	Check the specified FDL address and retry.
E441H	The FDL address of the target DP-Slave is overlapped with local FDL address (the DP-Master).	Check the specified FDL address and retry.
E442H	Invalid write data length	Check the specified write data length and retry.
E443H	Write abnormal response	Check detailed status codes 1 to 3 and take action.
E444H	Invalid slot number	Check the specified slot number and retry.
E445H	Invalid index	Check the specified index and retry.
E446H	Invalid CommRef number	Check the specified CommRef number and FDL address are correct and retry.
E447H	A Class 1 service for the acyclic communication function was executed while I/O data exchanges were stopped.	Turn on 'Data exchange start request signal' (Y0) and start I/O data exchanges. Check 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) for whether the bits relevant to the targets are on and retry.
E450H	• A physical execution error was detected. • System switching was executed while a service was being executed in the redundant system.	Check detailed status codes 2 to 3 and take action. Check 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) for whether the bits relevant to the targets are on and retry.
E451H	A protocol related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E452H	An application related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E460H	The DP-Slave detected a read error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E461H	The DP-Slave detected a write error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E462H	The DP-Slave detected a module error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E463H	The DP-Slave cannot handle the data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E464H	The DP-Slave detected an application error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E465H	The DP-Slave detected an unsupported request error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E466H	The DP-Slave detected an invalid index.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E467H	The DP-Slave detected an invalid specified data length.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E468H	The DP-Slave detected an invalid slot number.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E469H	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E46AH	The DP-Slave attempted to access an inaccessible area.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E46BH	The DP-Slave cannot access data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)
E46CH	The DP-Slave rejected access.	Check whether request data supported by the DP-Slave are correctly configured and retry. (Manual for each DP-Slave)

Status code	Error details and cause	Action
E46DH	The DP-Slave detected an invalid access range.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E46EH	The DP-Slave detected an invalid request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E46FH	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E470H	The DP-Slave detected an invalid parameter in the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E471H	The DP-Slave detected an abnormal resource during the reading processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E472H	The DP-Slave detected an abnormal resource during the writing processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E473H	The DP-Slave is already using the resource.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E474H	No resource is available to the DP-Slave.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E475H	A service unavailable for the specified DP-Slave was requested.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E476H	The DP-Slave does not have sufficient memory to process the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E477H	The DP-Slave invalidated the service.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E478H	The DP-Slave did not respond to the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E479H	• The DP-Slave did not respond to the request. • Request is executed while other function is operating.	• Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave) • When the acyclic communication function is executed successively to the same DP-Slave, adjust the execution interval and retry. (📖 Manual for each DP-Slave) • Check whether the interlock between the global control function and time control of DP-Slaves is correct and retry.
E480H	Target FDL address of DP-Slave out of range	Check the specified FDL address and retry.
E481H	The FDL address of the target DP-Slave is overlapped with local FDL address (the DP-Master).	Check the specified FDL address and retry.
E482H	INITIATE exception response	Check detailed status codes 1 to 3 and take action.
E483H	Invalid Alignment	Check the specified Alignment and retry.
E484H	Invalid CommRef number	Check the specified CommRef number and FDL address are correct and retry.
E485H	The total size of S Len and D Len is out of range.	Reduce the total size of S Len and D Len to 230 bytes or less and retry.
E490H	A physical execution error was detected.	Check detailed status codes 2 and take action.
E491H	A protocol related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E492H	An application related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E4A0H	The DP-Slave detected a read error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A1H	The DP-Slave detected a write error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A2H	The DP-Slave detected a module error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A3H	The DP-Slave cannot handle the data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A4H	The DP-Slave detected an application error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A5H	The DP-Slave detected an unsupported request error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A6H	The DP-Slave detected an invalid index.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A7H	The DP-Slave detected an invalid specified data length.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4A8H	The DP-Slave detected an invalid slot number.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)

Status code	Error details and cause	Action
E4A9H	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4AAH	The DP-Slave attempted to access an inaccessible area.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4ABH	The DP-Slave cannot access data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4ACH	The DP-Slave rejected access.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4ADH	The DP-Slave detected an invalid access range.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4AEH	The DP-Slave detected an invalid request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4AFH	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B0H	The DP-Slave detected an invalid parameter in the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B1H	The DP-Slave detected an abnormal resource during the reading processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B2H	The DP-Slave detected an abnormal resource during the writing processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B3H	The DP-Slave is already using the resource.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B4H	No resource is available to the DP-Slave.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B5H	A service unavailable for the specified DP-Slave was requested.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B6H	The DP-Slave does not have sufficient memory to process the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B7H	The DP-Slave invalidated the service.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4B8H	The DP-Slave did not respond to the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E4C0H	Invalid CommRef number	Check the specified CommRef number and FDL address are correct and retry.
E4D0H	The specified request is invalid.	Check the request code.
E4D1H to E4DBH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.
E4DCH	The same DP-Slave is the object of another acyclic communication function or alarm acquisition request.	Check that execution of other acyclic communication function and alarm acquisition requests is completed and retry.
E4DDH	No resource is available.	Check that execution of other acyclic communication function and alarm acquisition requests is completed and retry.
E4DEH	Invalid parameter setting	Check the parameters and retry.
E4DFH	The DP-Slave cannot respond.	Check the wiring of PROFIBUS cables and the start completed status of the DP-Slave, and retry. For the start completed status of DP-Slaves, refer to the manual for the DP-Slave.
	The DP-Slave is handling a Class 2 service and another service cannot be processed.	When the acyclic communication function is executed successively to the same DP-Slave, adjust the execution interval and retry. (📖 Manual for each DP-Slave)
	The INITIATE (Class 2) service has not been executed.	Retry after executing the INITIATE (Class 2) service .
	After the INITIATE (Class 2) service was executed, a transmission timeout occurred.	Increase the transmission timeout setting value for the INITIATE (Class 2) service).
	System switching was executed while a service was being executed in the redundant system.	Retry the INITIATE (Class2) service later from the DP-Master of the new control system. Time until the retry of the service is available differs depending on DP-Slaves.
E4E0H	No response was received from the DP-Slave.	Check the status of the DP-Slave and retry.
E4E1H	The same DP-Master is executing the following functions to the same DP-Slave. • Acyclic communication function • Alarm acquisition function	Check that the processing of the following functions are completed and retry. • Acyclic communication function • Alarm acquisition function
E4E3H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.
E500H	Target FDL address of DP-Slave out of range	Check the specified FDL address and retry.

Status code	Error details and cause	Action
E501H	The target FDL address of DP-Slave is for a not-configured station.	Check the specified FDL address and retry.
E502H	The FDL address of the target DP-Slave is overlapped with local FDL address (the DP-Master)	Check the specified FDL address and retry.
E503H	The target FDL address is for a reserved station or temporarily reserved station.	Check the specified FDL address and retry.
E504H	Invalid alarm acquisition request code	Check the specified request code and retry.
E505H	Invalid ACK request bit	Check the bits specified in 'Alarm request area' (Un\G26432 to Un\G26434) and retry.
E506H	Alarm acquisition request exception response	Check detailed status codes 1 to 3 and take action.
E507H	I/O data are not being exchanged.	Turn on 'Data exchange start request signal' (Y0) and retry.
E508H	An error response to an ACK request was detected.	Check detailed status codes 1 to 3 and take action.
E510H	A physical execution error was detected	Check detailed error codes 1 to 2 and take action.
E520H	The DP-Slave detected an invalid parameter in the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E521H	No alarm is available to the DP-Slave.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E530H	The alarm is not available.	Check whether the DP-Slave supports the alarm and retry.
E531H	Invalid DP-Slave status	Check whether the DP-Slave is correctly executing I/O data exchanges and retry.
E540H	Target FDL address of DP-Slave out of range	Check the specified FDL address and retry.
E541H	The target FDL address of DP-Slave is for a not-configured station.	Check the specified FDL address and retry.
E542H	The FDL address of the target DP-Slave is overlapped with local FDL address (the DP-Master).	Check the specified FDL address and retry.
E543H	The target FDL address is for a reserved station or temporarily reserved station.	Check the specified FDL address and retry.
E544H	Invalid alarm type	Check that the alarm for which ACK is returned are stored in 'Alarm response area' (Un\G26446 to Un\G26768) and retry.
E545H	Alarm ACK request exception response	Check detailed status codes 1 to 3 and take action.
E546H	Invalid slot number	Check that the alarm for which ACK is returned are stored in 'Alarm response area' (Un\G26446 to Un\G26768) and retry.
E547H	Invalid sequence number	Check that the alarm for which ACK is returned are stored in 'Alarm response area' (Un\G26446 to Un\G26768) and retry.
E550H	A physical execution error was detected.	Check detailed status codes 2 and take action.
E551H	A protocol related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E552H	An application related execution error was detected.	Check detailed status codes 2 to 3 and take action.
E560H	The DP-Slave detected a read error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E561H	The DP-Slave detected a write error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E562H	The DP-Slave detected a module error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E563H	The DP-Slave cannot handle the data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E564H	The DP-Slave detected an application error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E565H	The DP-Slave detected an unsupported request error.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E566H	The DP-Slave detected an invalid index.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E567H	The DP-Slave detected an invalid specified data length.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E568H	The DP-Slave detected an invalid slot number.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)

Status code	Error details and cause	Action
E569H	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E56AH	The DP-Slave attempted to access an inaccessible area.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E56BH	The DP-Slave cannot access data.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E56CH	The DP-Slave rejected access.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E56DH	The DP-Slave detected an invalid access range.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E56EH	The DP-Slave detected an invalid request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E56FH	The DP-Slave detected an invalid data type.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E570H	The DP-Slave detected an invalid parameter in the request.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E571H	The DP-Slave detected an abnormal resource during the reading processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E572H	The DP-Slave detected an abnormal resource during the writing processing.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E573H	The DP-Slave is already using the resource.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E574H	No resource is available to the DP-Slave.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E575H	The ACK request contains an invalid parameter.	Check whether request data supported by the DP-Slave are correctly configured and retry. (📖 Manual for each DP-Slave)
E576H	No alarm is available for the ACK request.	Check the alarm occurrence status of the specified DP-Slave and retry.
E580H	No alarm is available for the ACK request.	Check the alarm occurrence status of the specified DP-Slave and retry.
E581H	The alarm specified in the ACK request is not present.	Check the alarm occurrence status of the specified DP-Slave and retry.
E582H	The alarm function is deactivated for the specified DP-Slave. Therefore no alarm is available for the ACK request.	Check whether the DP-Slave supports the alarm and retry.
E590H to E59AH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.
E59BH	The acyclic communication function is being executed for the same DP-Slave.	Check that execution of the acyclic communication function is completed and retry.
E59CH	No resource is available.	Check that execution of the acyclic communication function is completed and retry.
E59DH	Invalid parameter setting	Check the parameters and retry.
E59EH	The DP-Slave cannot respond. The DP-Slave is handling a Class 2 service and another service cannot be processed.	Check the wiring of PROFIBUS cables and the start completed status of the DP-Slave, and retry. When the acyclic communication function is executed successively to the same DP-Slave, adjust the execution interval and retry. For the start completed status of DP-Slaves and the intervals of executing the acyclic communication function, refer to the following. 📖 Manual for each DP-Slave
E59FH	No response was received from the DP-Slave.	Check the status of the DP-Slave and retry.
E5A0H	The same DP-Master is executing the following functions to the same DP-Slave. • Acyclic communication function • Alarm acquisition function	Check that the processing of the following functions are completed and retry. • Acyclic communication function • Alarm acquisition function
E5A2H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.
E600H	Invalid request code	Check the request code and retry.
E601H	No other time master has written clock data.	After another time master writes clock data, retry the time data read request.
E602H to E605H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.
E606H	Value set in time master setting out of range	Modify the setting and the time master can read data and retry.
E611H	The UTC second value specified in 'Time control setting request area' (Un\G26784 to Un\G26792) is out of range.	Check the specified UTC second value and retry.

Status code	Error details and cause	Action
E612H to E625H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.
E626H	Invalid year (when write is requested)	Check the request data and retry.
E627H	Invalid month (when write is requested)	Check the request data and retry.
E628H	Invalid day (when write is requested)	Check the request data and retry.
E629H	Month and day are inconsistent (when write is requested)	Check the request data and retry.
E62AH	Invalid hour (when write is requested)	Check the request data and retry.
E62BH	Invalid minute (when write is requested)	Check the request data and retry.
E62CH	Invalid second (when write is requested)	Check the request data and retry.
E62DH	Invalid millisecond (when write is requested)	Check the request data and retry.
E62EH	Time control error	Check the request data and retry.
F120H	Diagnostic information was detected in a DP-Slave.	Check Diagnostic information area for the diagnostic information detected in the DP-Slave and take action against the problem.
F121H	A DP-Master or DP-Slave on the same line has the same FDL address.	Check the FDL addresses for the DP-Master and DP-Slave and then configure them with the different FDL addresses. Check that the firmware version is "04" or later in the redundant system.
F122H	An error was detected on the line. Or the master parameters are inappropriate.	Check wiring of bus terminators and PROFIBUS cables. When the bus terminators and PROFIBUS cables are wired correctly, increase setting value "Min. slave interval" of the master parameters.
F123H	An error was detected on the line. Or the master parameters are inappropriate.	Check wiring of bus terminators and PROFIBUS cables. When the bus terminators and PROFIBUS cables are wired correctly, increase setting value "Min. slave interval" of the master parameters.
F124H	An error was detected on the line. Or the master parameters are inappropriate.	Check wiring of bus terminators and PROFIBUS cables. When the bus terminators and PROFIBUS cables are wired correctly, increase setting value "Min. slave interval" of the master parameters.
F125H	The DP-Master is in the clear request sent state.	Since master parameter "Error action flag" is checked, clear requests are being sent to all the DP-Slaves. When clear requests do not need sending, uncheck "Error action flag".
F126H	The line status is unstable. Or the PROFIBUS cable has short-circuited.	Check wiring of bus terminators and PROFIBUS cables. Check whether the PROFIBUS cable has short-circuited.

5.7 Event List

This section lists the events which occur in the RJ71PB91V.

There are two event types system and operation.

System

Event code	Overview	Cause	Station type
00600	I/O data exchanges started	I/O data exchanges with DP-Slaves have started.	DP-Master
00680	I/O data exchanges started	I/O data exchanges with the DP-master have started.	DP-Slave
00681	SYNC mode started	The SYNC mode has started at the SYNC request from the DP-Master.	DP-Slave
00682	SYNC mode terminated	The SYNC mode was terminated at the UNSYNC request from the DP-Master or by stoppage of communications.	DP-Slave
00683	FREEZE mode started	The FREEZE mode has started at the FREEZE request from the DP-Master.	DP-Slave
00684	FREEZE mode terminated	The FREEZE mode was terminated at the UNFREEZE request from the DP-Master or by stoppage of communications.	DP-Slave
00685	FDL address set request acceptance	The FDL address was changed at the FDL address set request (Set_Slave_Add) from the DP-Master.	DP-Slave
00690	Input send area refresh started	Data transmission to 'Input send area' (Un\G256 to Un\G447) on the DP-Master has started.	DP-Slave
00692	Extended diagnostic information cleared	Correction of relevant error of the local FDL address was notified.	DP-Slave
00693	Module error reset executed	Error occurred on the own module was reset.	DP-Slave
00694	Operation mode changing function	Operation mode of the own module was changed.	DP-Slave
00696	FDL address changed	FDL address of the local FDL address was changed by 'FDL address change request signal' (Y13).	DP-Slave
00A00	System switching request issued	A system switching request has occurred.	DP-Master
00E00	I/O data exchanges stopped	I/O data exchanges with DP-Slaves have stopped.	DP-Master
00E01	Diagnostic information detection in DP-Slave	Diagnostic information was detected in a DP-Slave. (Corresponding status code: F120H)	DP-Master
00E02	FDL address in use	DP-Masters on the same line has the same FDL address. (Corresponding status code: F121H)	DP-Master
00E03	Line error	An error was detected on the line. Or the master parameters are inappropriate. (Corresponding status code: F122H)	DP-Master
00E04	Line error	An error was detected on the line. Or the master parameters are inappropriate. (Corresponding status code: F123H)	DP-Master
00E05	Line error	An error was detected on the line. Or the master parameters are inappropriate. (Corresponding status code: F124H)	DP-Master
00E06	Clear request sent state	The DP-Master is in the clear request sent state. (Corresponding status code: F125H)	DP-Master
00E07	Line error	The line status is unstable. Or the PROFIBUS cable has short-circuited. (Corresponding status code: F126H)	DP-Master
00E80	Extended diagnostic information notification	Extended diagnostic information of the local FDL address was notified to the DP-Master.	DP-Slave
00E81	I/O data exchanges stopped	I/O data exchanges with the DP-master have stopped.	DP-Slave
00E82	Input send area refresh stopped	Data transmission to 'Input send area' (Un\G256 to Un\G447) on the DP-Master has stopped.	DP-Slave

Operation

Event code	Overview	Cause	Station type
20100	Diagnostic information detection reset	Diagnostic information detection reset request was executed.	DP-Master
26000	Error clear	Error was cleared with the engineering tool.	DP-Slave

APPENDICES

Appendix 1 I/O Signals of DP-Master

This section describes the I/O signals for the CPU module. The assignment of the I/O signals is shown under the assumption that the start I/O number for the RJ71PB91V is 0.

List of I/O signals

This section lists I/O signals when the RJ71PB91V is used as the DP-Master. Device X indicates input signals sent from the RJ71PB91V to the CPU module. Device Y indicates output signals sent from the CPU module to the RJ71PB91V.

Input signal

Device No.	Signal name
X0	Data exchange start completed signal
X1	Diagnostic information detection signal
X2	Diagnostic information area cleared signal
X3	Use prohibited
X4	Global control completed signal
X5	Global control failed signal
X6	Extended diagnostic information read response signal
X7 to XF	Use prohibited
X10	Operation mode signal
X11	Operation mode change completed signal
X12 to X17	Use prohibited
X18	Alarm read response signal
X19	Time control start response signal
X1A	Use prohibited
X1B	Communication READY signal
X1C	Use prohibited
X1D	Module ready signal
X1E	Use prohibited
X1F	Module watchdog timer error signal

A

Output signal

Device No.	Signal name
Y0	Data exchange start request signal
Y1	Diagnostic information detection reset request signal
Y2	Diagnostic information area clear request signal
Y3	Use prohibited
Y4	Global control request signal
Y5	Use prohibited
Y6	Extended diagnostic information read request signal
Y7 to Y10	Use prohibited
Y11	Operation mode change request signal
Y12 to Y17	Use prohibited
Y18	Alarm read request signal
Y19	Time control start request signal
Y1A to Y1F	Use prohibited

Point

Do not turn on "Use prohibited" signals of the I/O signals for the CPU module. Doing so may cause the programmable controller system to malfunction.

I/O signals of DP-Master and global label compatibility list

To use global labels, update the PROFIBUS label using the PROFIBUS Configuration Tool. (☞ Page 86 Update PROFIBUS Label)

Input signal

Name	Global label
Data exchange start completed signal (X0)	glRJ71PB91V_1.stMgmtInputs_D.bDataExchStartCompleted
Diagnostic information detection signal (X1)	glRJ71PB91V_1.stMgmtInputs_D.bDiagInfoDetected
Diagnostic information area cleared signal (X2)	glRJ71PB91V_1.stMgmtInputs_D.bDiagInfoCleared
Global control completed signal (X4)	glRJ71PB91V_1.stMgmtInputs_D.bGlobalControlCompleted
Global control failed signal (X5)	glRJ71PB91V_1.stMgmtInputs_D.bGlobalControlFailed
Extended diagnostic information read response signal (X6)	glRJ71PB91V_1.stMgmtInputs_D.bExtendedDiagnosticResponse
Operation mode signal (X10)	glRJ71PB91V_1.stMgmtInputs_D.bOperationModeChanging
Operation mode change completed signal (X11)	glRJ71PB91V_1.stMgmtInputs_D.bOperationModeChangeCompleted
Alarm read response signal (X18)	glRJ71PB91V_1.stMgmtInputs_D.bAlarmReadResponse
Time control start response signal (X19)	glRJ71PB91V_1.stMgmtInputs_D.bTimeControlResponse
Communication READY signal (X1B)	glRJ71PB91V_1.stMgmtInputs_D.bCommunicationReady
Module ready signal (X1D)	glRJ71PB91V_1.stMgmtInputs_D.bModuleReady
Module watchdog timer error signal (X1F)	glRJ71PB91V_1.stMgmtInputs_D.bWatchdogTimerError

Output signal

Name	Global label
Data exchange start request signal (Y0)	glRJ71PB91V_1.stMgmtOutputs_D.bDataExchStartRequest
Diagnostic information detection reset request signal (Y1)	glRJ71PB91V_1.stMgmtOutputs_D.bDiagInfoReset
Diagnostic information area clear request signal (Y2)	glRJ71PB91V_1.stMgmtOutputs_D.bDiagInfoClearRequest
Global control request signal (Y4)	glRJ71PB91V_1.stMgmtOutputs_D.bGlobalControlRequest
Extended diagnostic information read request signal (Y6)	glRJ71PB91V_1.stMgmtOutputs_D.bExtendedDiagnosticRequest
Operation mode change request signal (Y11)	glRJ71PB91V_1.stMgmtOutputs_D.bOperationModeChangeRequest
Alarm read request signal (Y18)	glRJ71PB91V_1.stMgmtOutputs_D.bAlarmReadRequest
Time control start request signal (Y19)	glRJ71PB91V_1.stMgmtOutputs_D.bTimeControlRequest

Details of I/O signals of DP-Master

This section describes details of I/O signals when the RJ71PB91V is used as the DP-Master.

In the redundant system, the DP-Masters of both systems operate as follows in response to output signals after system switching.

- DP-Master of the new control system: No processing within one scan after RUN (operation details after two scans are described in the section of each output signal).
- DP-Master of the new standby system: No processing

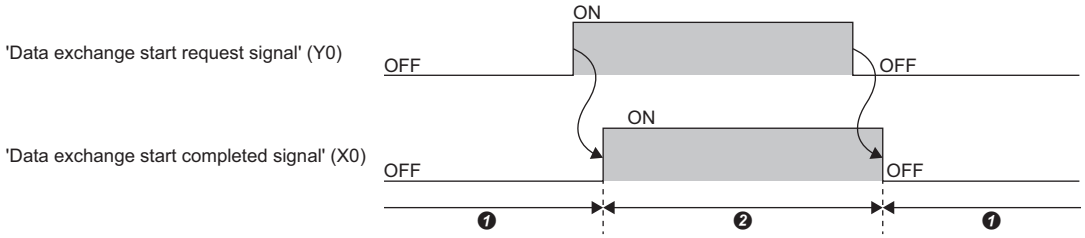
Data exchange start signals (Y0) and (X0)

'Data exchange start request signal' (Y0) is turned on when I/O data exchanges are started.

When 'Data exchange start request signal' (Y0) is turned on and I/O data exchanges start, 'Data exchange start completed signal' (X0) turns on.

'Data exchange start completed signal' (X0) turns off in one of the following cases.

- 'Data exchange start request signal' (Y0) is turned off
- An error causes I/O data exchanges to stop
- The RJ71PB91V is switched into another operation mode
- A communications error occurs to a DP-Slave (When master parameter "Error action flag" is checked)



❶ I/O data exchanges stopped
❷ I/O data being exchanged

The signals are used as interlock signals when I/O data are read/written.

Initial values of output data are written to the buffer memory before 'Data exchange start request signal' (Y0) is turned on.

Turn off 'Data exchange start request signal' (Y0) clears the information in the following areas. The other buffer memory areas hold their information.

- 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047)
- 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424)

When 'Data exchange start request signal' (Y0) is turned on, the following areas are cleared.

- 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047)
- 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064)
- 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424)
- 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321)
- 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454)
- 'Current bus cycle time area (Un\G2272)'
- 'Minimum bus cycle time area (Un\G2273)'
- 'Maximum bus cycle time area (Un\G2274)'

■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

- 'Data exchange start request signal' (Y0) is on: Data exchange continues, and 'Data exchange start completed signal' (X0) turns on in the first communication after system switching.
- 'Data exchange start request signal' (Y0) is off: The lines are disconnected.

Diagnostic information detection signals (Y1) and (X1)

■Processing when 'Diagnostic information detection signal' (X1) turns on

After the time that is specified in 'Diagnostic information non-notification time setting area' (Un\G2084) has elapsed, 'Diagnostic information detection signal' (X1) turns on if a communications error is detected.

Once 'Diagnostic information detection signal' (X1) turns on, the following processing takes place.

- BF LED turns on.
- The diagnostic information is stored in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321).
- The extended diagnostic information is stored in 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454).
- Bit in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) relevant to the station that sent the diagnostic information turns on.
- An error information of RJ71PB91V is stored into 'Local station error information area' (Un\G23071).

■Processing when 'Diagnostic information detection reset request signal' (Y1) turns on.

Turning on 'Diagnostic information detection reset request signal' (Y1) causes 'Diagnostic information detection signal' (X1) to turn off.

The following processing takes place when 'Diagnostic information detection signal' (X1) turns off.

- BF LED turns off.
- Bit in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) relevant to the station that sent the diagnostic information turns off.

When 'Diagnostic information detection reset request signal' (Y1) is on, occurrence of another piece of diagnostic information leads to the following state.

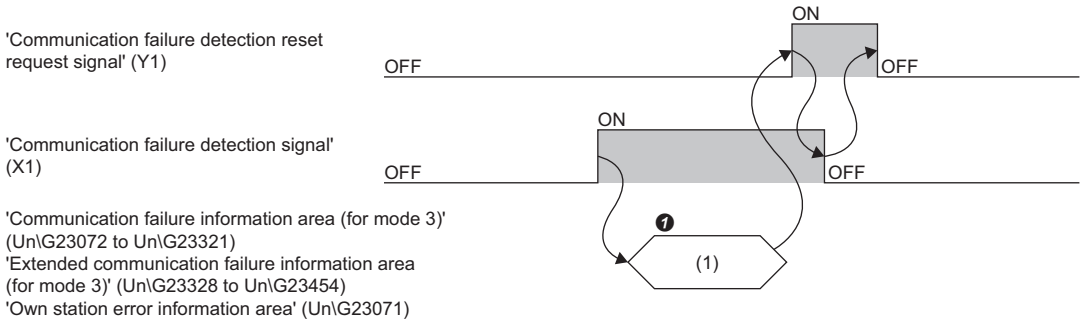
- 'Diagnostic information detection signal' (X1) does not turn on.
- BF LED does not turn on.
- Bit in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) relevant to the station that sent the diagnostic information does not turn on.

After 'Diagnostic information detection signal' (X1) turns off, take action against the cause of the error and turn off 'Diagnostic information detection reset request signal' (Y1).

■Processing when 'Diagnostic information detection reset request signal' (Y1) turns off.

After 'Diagnostic information detection reset request signal' (Y1) is turned off, the RJ71PB91V rechecks diagnostic information.

If diagnostic information has been generated, 'Diagnostic information detection signal' (X1) turns on and the following processing takes place. (☞ Page 199 Processing when 'Diagnostic information detection signal' (X1) turns on)



(1) MOV instruction or FROM instruction

❶ Read diagnostic information, extended diagnostic information, local FDL address error information from the buffer memory.

A

Point

Turning on 'Diagnostic information detection reset request signal' (Y1) does not clear the following information.

To clear the information, turn on 'Diagnostic information area clear request signal' (Y2).

- 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321)
- 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454)
- 'Local station error information area' (Un\G23071)

■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

- 'Diagnostic information detection reset request signal' (Y1) is on: The processing when 'Diagnostic information detection reset request signal' (Y1) is on is executed.
- 'Diagnostic information detection reset request signal' (Y1) is off: No processing

Diagnostic information area clear signals (Y2) and (X2)

'Diagnostic information area clear request signal' (Y2) is turned on when the following information is cleared.

- 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321)
- 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454)
- 'Local station error information area' (Un\G23071)

After 'Diagnostic information area clear request signal '(Y2) is turned on and the processing above is completed, 'Diagnostic information area cleared signal' (X2) turns on. The DIA LED turns off if an alarm is not detected in 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424).

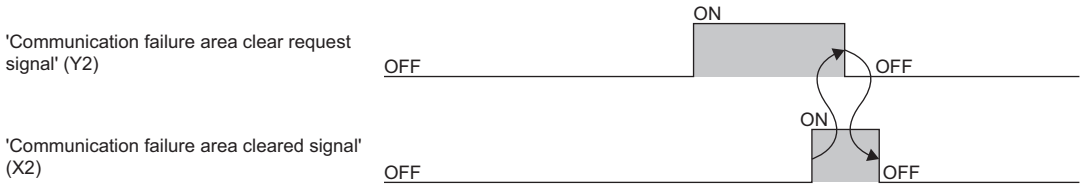
When 'Diagnostic information area clear request signal' (Y2) is on, if another piece of diagnostic information is generated, the following information remains cleared. (Diagnostic information, extended diagnostic information, and local FDL address error information will not be stored.)

- 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321)
- 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454)
- 'Local station error information area' (Un\G23071)

After 'Diagnostic information area cleared signal' (X2) turns on, 'Diagnostic information area clear request signal' (Y2) is turned off.

Taking action against the error cause and turning off 'Diagnostic information area clear request signal' (Y2) causes 'Diagnostic information area cleared signal' (X2) to turn off.

After 'Diagnostic information area clear request signal' (Y2) is turned off, the RJ71PB91V rechecks diagnostic information. With any piece of diagnostic information generated, diagnostic information, extended diagnostic information, and local FDL address error information are stored in the buffer memory.



■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

- 'Diagnostic information area clear request signal' (Y2) is on: The processing when 'Diagnostic information area clear request signal' (Y2) is turned on is executed.
- 'Diagnostic information area clear request signal' (Y2) is off: No processing

Global control functions (Y4), (X4), and (X5)

■'Global control request signal' (Y4) and 'Global control completed signal' (X4)

'Global control request signal' (Y4) is turned on when the global control function is executed.

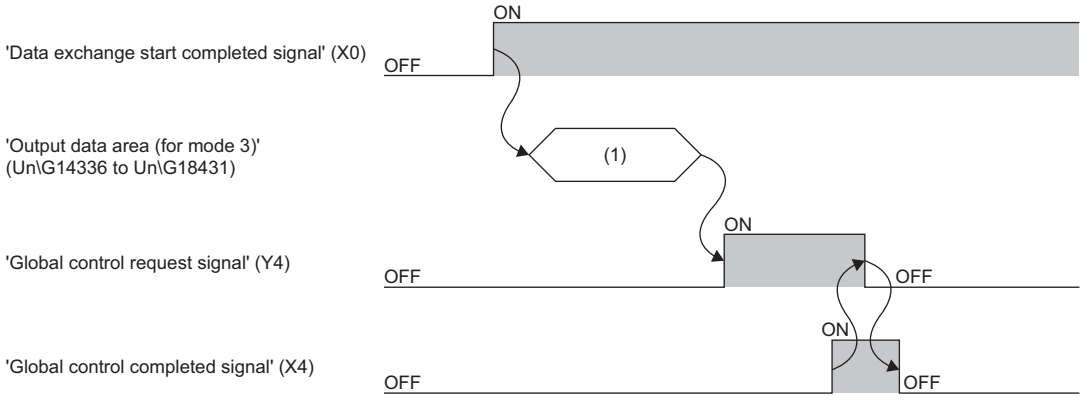
After 'Global control request signal' (Y4) is turned on and the global control function processing is completed, 'Global control completed signal' (X4) turns on.

After 'Global control completed signal' (X4) turns on, 'Global control request signal' (Y4) is turned off.

Turning off 'Global control request signal' (Y4) causes 'Global control completed signal' (X4) to turn off.

'Global control request signal' (Y4) is turned on when 'Data exchange start completed signal' (X0) is on.

When 'Data exchange start completed signal' (X0) is off, if 'Global control request signal' (Y4) is turned on, both 'Global control completed signal' (X4) and 'Global control failed signal' (X5) turn on. (☞ Page 201 'Global control failed signal' (X5))



(1) Writing output data

■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

- 'Global control request signal' (Y4) is on: The processing when 'Global control request signal' (Y4) is turned on is executed.
- 'Global control request signal' (Y4) is turned off: No processing

■'Global control failed signal' (X5)

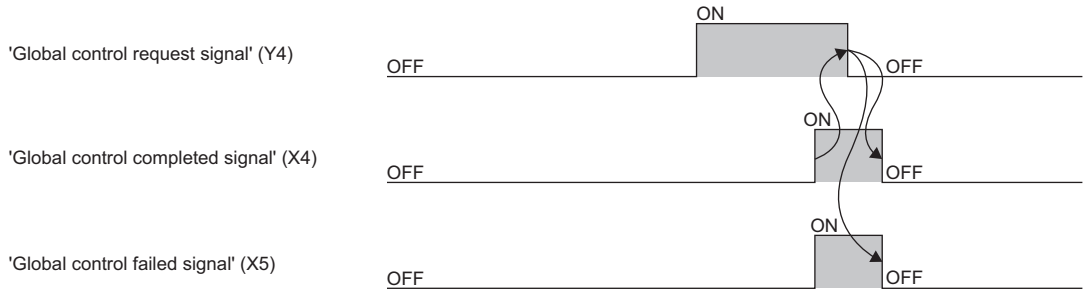
When 'Data exchange start completed signal' (X0) is off, if 'Global control request signal' (Y4) is turned on, both 'Global control completed signal' (X4) and 'Global control failed signal' (X5) turn on.

If 'Global control failed signal' (X5) is on, this indicates that execution of the global control function has been completed with an error.

Take action against the cause of the error and retry the global control function.

When 'Global control failed signal' (X5) is on, if DP-Slaves already have I/O data, the DP-Slave holds the data.

Turning off 'Global control request signal' (Y4) causes 'Global control failed signal' (X5) to turn off.

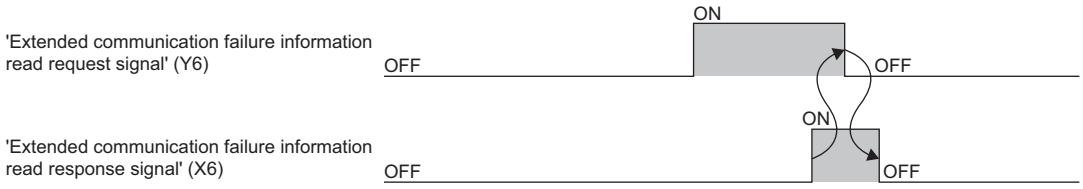


Precautions

The global control function cannot be executed with the acyclic communication function. When used in conjunction with these functions, configure an interlock circuit in the program.

Extended diagnostic information read signals (Y6) and (X6)

'Extended diagnostic information read request signal' (Y6) is turned on when extended diagnostic information on a specified FDL address is acquired. The FDL address is specified in 'Extended diagnostic information read request area' (Un\G23456).
Turning on 'Extended diagnostic information read request signal' (Y6) causes information in 'Extended diagnostic information read response area' (Un\G23457 to Un\G23583) to be cleared.
After 'Extended diagnostic information read request signal' (Y6) is turned on and extended diagnostic information on the specified FDL address is acquired, 'Extended diagnostic information read response signal' (X6) turns on.
After 'Extended diagnostic information read response signal' (X6) turns on, 'Extended diagnostic information read request signal' (Y6) is turned off.
Turning off 'Extended diagnostic information read request signal' (Y6) causes 'Extended diagnostic information read response signal' (X6) to turn off.



■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

- 'Extended diagnostic information read request signal' (Y6) is on: The processing when 'Extended diagnostic information read request signal' (Y6) is turned on is executed.
- 'Extended diagnostic information read request signal' (Y6) is off: No processing

Operation mode signal (X10)

This signal indicates whether the current operation mode is communication mode (mode 3).

- On: Other than communication mode (mode 3)
- Off: Communication mode (mode 3)

Operation mode change signals (Y11) and (X11)

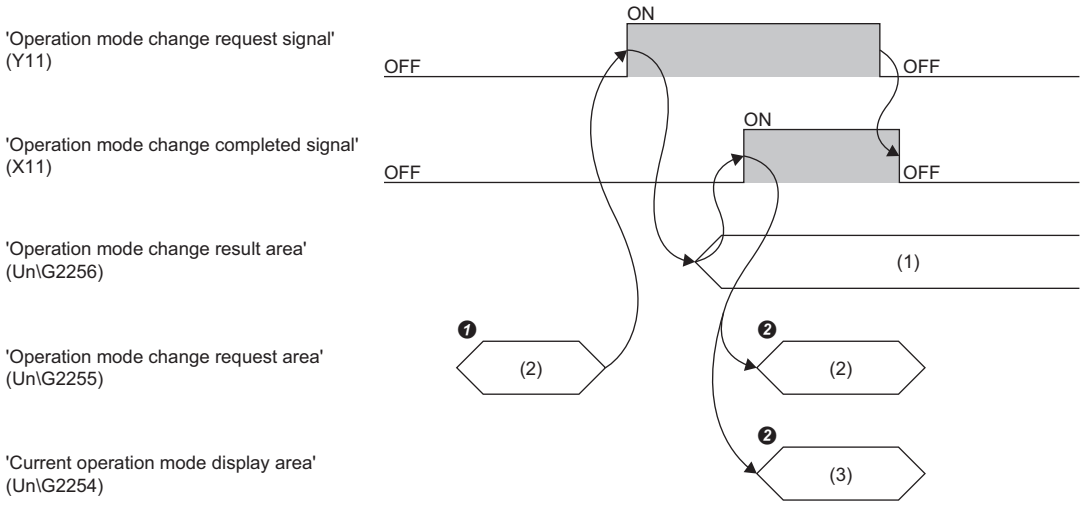
'Operation mode change request signal' (Y11) is turned on when the module needs switching into a mode specified in 'Operation mode change request area' (Un\G2255).

Turning on 'Operation mode change request signal' (Y11) causes information in 'Operation mode change result area' (Un\G2256) to be cleared. The 'Current operation mode area' (Un\G2254) and 'Operation mode change request area' (Un\G2255) are temporarily cleared.

After the operation mode is changed and the change result is stored in 'Operation mode change result area' (Un\G2256), 'Operation mode change completed signal' (X11) turns on.

Check that 'Operation mode change result area' (Un\G2256) has stored A300H (Completed successfully) and turn off 'Operation mode change request signal' (Y11).

Turning off 'Operation mode change request signal' (Y11) causes 'Operation mode change completed signal' (X11) to turn off.



(1) Operation mode change result
(2) Operation mode to be changed
(3) Operation mode has changed
❶ Set the operation mode.
❷ Check the results.

■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

- 'Operation mode change request signal' (Y11) is on: The processing when 'Operation mode change request signal' (Y11) is turned on is executed.
- 'Operation mode change request signal' (Y11) is off: No processing

A

Alarm read signals (Y18) and (X18)

'Alarm read request signal' (Y18) is turned on in accordance with each format settings of the 'Alarm request areas' (Un\G26432 to Un\G26434) when an alarm is acquired in the specified DP-Slave.

Turning on 'Alarm read request signal' (Y18) causes information in 'Alarm response area' (Un\G26446 to Un\G26768) to be temporarily cleared, and acquired alarms are stored.

However, the following areas are not cleared when the alarm ACK request is issued.

Buffer memory address	Description
Un\G26449 to Un\G26484	The area where alarm No.1 is stored.
Un\G26489 to Un\G26524	The area where alarm No.2 is stored.
Un\G26529 to Un\G26564	The area where alarm No.3 is stored.
Un\G26569 to Un\G26604	The area where alarm No.4 is stored.
Un\G26609 to Un\G26644	The area where alarm No.5 is stored.
Un\G26649 to Un\G26684	The area where alarm No.6 is stored.
Un\G26689 to Un\G26724	The area where alarm No.7 is stored.
Un\G26729 to Un\G26764	The area where alarm No.8 is stored.

When an alarm is acquired and ACK is returned to the appropriate DP-Slave, the DIA LED turns off when both of the following conditions are met.

- Bits of all DP-Slaves are off in 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424).
- Bit 11 is off for status 1 in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321).

When an alarm is acquired and ACK is returned to the appropriate DP-Slave, the BF LED turns off when both of the following conditions are met.

- Bits of all DP-Slaves are off in 'Slave status area (Alarm detection)' (Un\G26416 to Un\G26424).
- Bits of all DP-Slaves are off in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064).

After an alarm is acquired and the result is stored in 'Alarm response area' (Un\G26446 to Un\G26768), 'Alarm read response signal' (X18) turns on.

Turning off 'Alarm read request signal' (Y18) causes 'Alarm read response signal' (X18) to turn off.

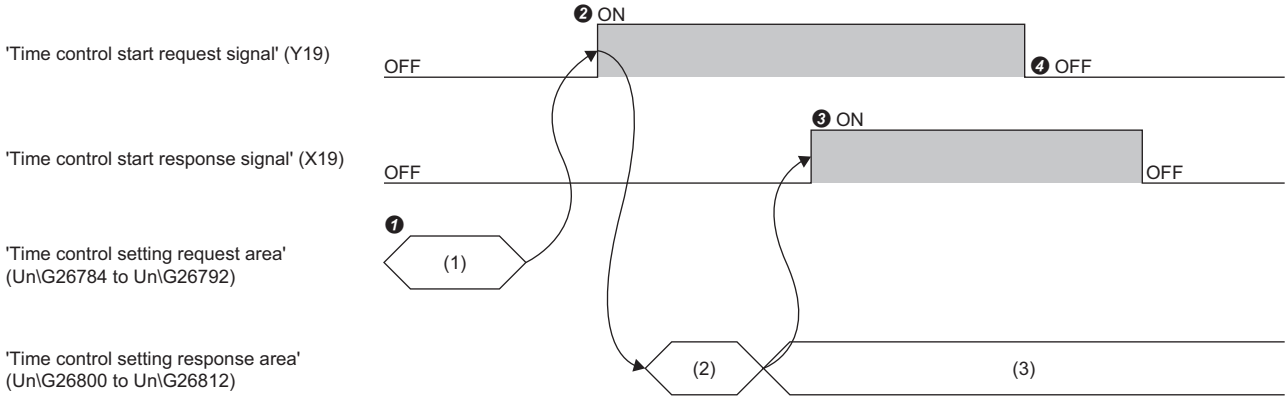
■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

- 'Alarm read request signal' (Y18) is on: The processing when 'Alarm read request signal' (Y18) is turned on is executed (because an alarm notified before system switching cannot be read, a read error occurs).
- 'Alarm read request signal' (Y18) is off: No processing

Time control start signals (Y19) and (X19)

'Time control start request signal' (Y19) is turned on when the time control function of a DP-Slave operates for a DP-Slave according to information set in 'Time control setting request area' (Un\G26784 to Un\G26792).
After the time control function is run for the DP-Slave and the result is stored in 'Time control setting response area' (Un\G26800 to Un\G26812), 'Time control start response signal' (X19) turns on.



(1) Set
(2) Clear
(3) Store result

❶ Information is set in 'Time control setting request area' (Un\G26784 to Un\G26792).
❷ Turning on 'Time control start request signal' (Y19) causes information in 'Time control setting response area' (Un\G26800 to Un\G26812) to be cleared and time control to be executed.
❸ After the time control function is run for a DP-Slave and the result is stored in 'Time control setting response area' (Un\G26800 to Un\G26812), 'Time control start response signal' (X19) turns on.
❹ Turning off 'Time control start request signal' (Y19) causes 'Time control start response signal' (X19) to turn off.

Precautions

Time control over DP-Slaves cannot be executed with the acyclic communication function. When used in conjunction with these functions, configure an interlock circuit in the program.

■Operation in the redundant system

In the second and later scans, that follows system switching, the DP-Master of the new control system operates as follows.

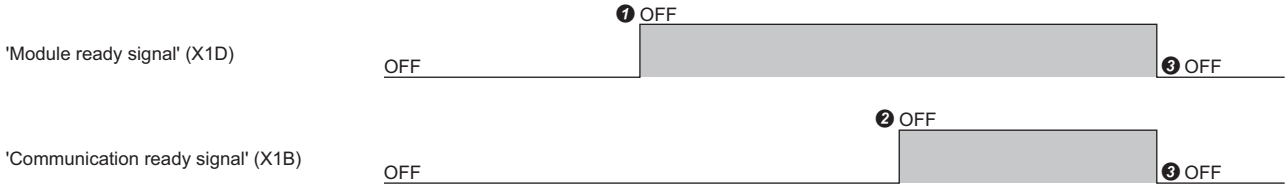
- 'Time control start response signal' (X19) is on: The processing when 'Time control start response signal' (X19) turns on is executed.
- 'Time control start response signal' (X19) is off: No processing

Communication READY signal (X1B)

'Communication READY signal' (X1B) turns on after 'Module READY signal' (X1D) turns on and I/O data exchanges are ready. (Turns on when the operation mode is communication mode (mode 3).)

This signal turns off if an error that prevents I/O data exchanges occur to the RJ71PB91V.

The signal is used as an interlock signal when 'Data exchange start request signal' (Y0) is turned on.



❶ Module starts
❷ Communications are ready
❸ When an error that prevents continuation occurs

Module ready signal (X1D)

This signal turns on when the RJ71PB91V starts. (This signal turns on in any operation mode.)

This signal turns off when the RJ71PB91V is not ready.

Module watchdog timer error signal (X1F)

This signal turns on when a module watchdog timer error occurs on the RJ71PB91V.

'Module watchdog timer error signal' (X1F) does not turn off until the CPU module is reset.

Precautions

- 'Module watchdog timer error signal' (X1F) turns on when the RJ71PB91V suddenly stops.
- The module watchdog timer error differs from a communication timeout error caused by the communication watchdog timer.

Appendix 2 I/O Signals of DP-Slave

This section describes I/O signals for the CPU module. The assignment of I/O signals is shown when the start I/O number for the RJ71PB91V(S) is 0.

List of I/O signals of DP-Slave

This section lists I/O signals when the RJ71PB91V is used as a DP-Slave. Device X indicates input signals sent from the RJ71PB91V to the CPU module. Device Y indicates output signals sent from the CPU module to the RJ71PB91V.

Input signal

Device No.	Signal name
X0	Module watchdog timer error signal
X1	Data exchanging signal
X2	Extended diagnostic information notification completed signal
X3	Module error signal
X4	Use prohibited
X5	During SYNC mode signal
X6	SYNC receive signal
X7	During FREEZE mode signal
X8 to X10	Use prohibited
X11	Operation mode change completed signal
X12	Use prohibited
X13	FDL address change completed signal
X14 to X1C	Use prohibited
X1D	Module ready signal
X1E to X1F	Use prohibited

Output signal

Device No.	Signal name
Y0	Input send area refresh instruction signal
Y1	Use prohibited
Y2	Extended diagnostic information notification request signal
Y3	Module error reset request signal
Y4 to Y10	Use prohibited
Y11	Operation mode change request signal
Y12	Use prohibited
Y13	FDL address change request signal
Y14 to Y1F	Use prohibited

Point

Do not turn on "Use prohibited" signals of I/O signals for the CPU module. Doing so may cause the programmable controller system to malfunction.

A

Details of I/O signals of DP-Slave

This section describes details of I/O signals when the RJ71PB91V is used as a DP-Slave.

Module watchdog timer error signal (X0)

This signal turns on when a module watchdog timer error occurs on the RJ71PB91V.
This signal turns off when the CPU module is reset.
If the signal turns on again, the RJ71PB91V may have a hardware failure. In such a case, please consult your local Mitsubishi representative.

Precautions

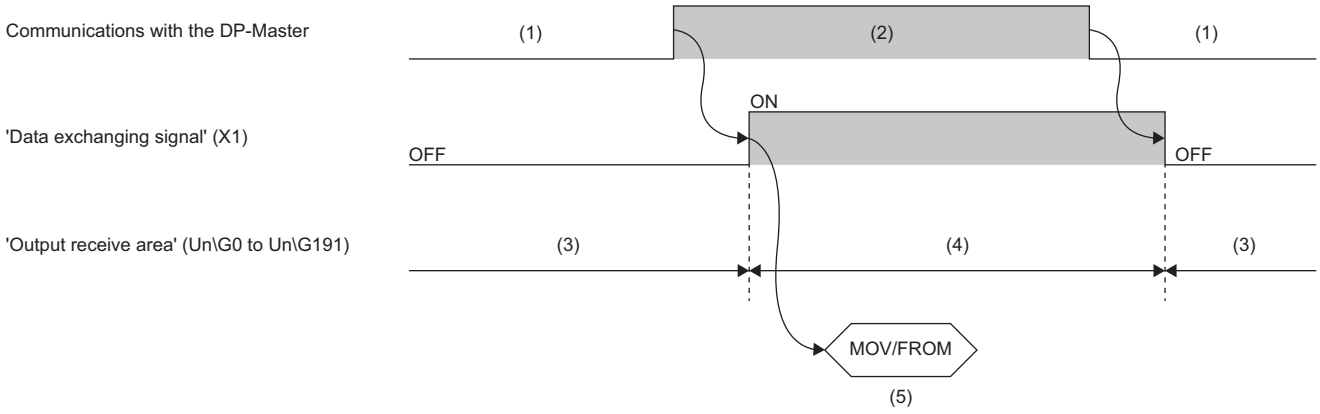
- 'Module watchdog timer error signal' (X0) turns on when the RJ71PB91V suddenly stops.
- The module watchdog timer error differs from a timeout error caused by the communication watchdog timer during the communication with the DP-Master.

Data exchanging signal (X1)

This signal turns on when the RJ71PB91V is ready for communication with the DP-Master.
While this signal is on, 'Output receive area' (Un\G0 to Un\G191) is updated with the output data sent from the DP-Master. (Data are updated irrespective of the status of 'Input send area refresh instruction signal' (Y0)).
When the communication with the DP-Master stops, the signal behaves as follows. (☞ Page 268 Current communication watchdog timer value (Un\G2257))

- When the communication watchdog timer is disabled on the DP-Master: The signal does not turn off because no communication timeout errors occur. (Data in 'Output receive area' (Un\G0 to Un\G191) are retained.)
- When the communication watchdog timer is enabled on the DP-Master: The signal turns off when a communication timeout error occurs.

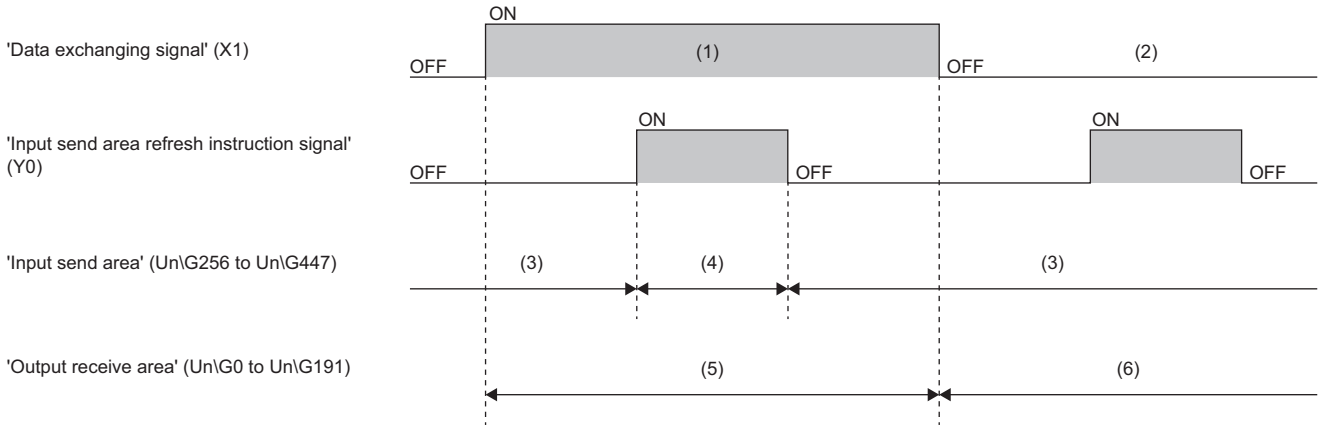
The signal is used as an interlock signal for reading data from 'Output receive area' (Un\G0 to Un\G191) instructed by the MOV instruction or FROM instruction.



(1) Communications stopped
(2) During communications
(3) Not updated
(4) Updated
(5) The MOV instruction or FROM instruction (Data are read from 'Output receive area' (Un\G0 to Un\G191).)

Input send area refresh instruction signal (Y0)

When this signal is turned on while 'Data exchanging signal' (X1) is on, input data in 'Input send area' (Un\G256 to Un\G447) is sent to the DP-Master. (Zero data is sent until 'Input send area refresh instruction signal' (Y0) is turned on.)
When the signal is turned off, the RJ71PB91V stops sending input data to the DP-Master. ('Output receive area' (Un\G0 to Un\G191) is kept refreshed.)



(1) During communications
(2) Communications stopped
(3) Not sent (Zero data is sent.)
(4) Sent
(5) Updated
(6) Not updated

When the DP-Master goes down, input data or zero data is sent depending on the setting of the communication watchdog timer of the DP-Master. (☞ Page 268 Current communication watchdog timer value (Un\G2257))

Extended diagnostic information notification signals (X2) and (Y2)

'Extended diagnostic information notification completed signal' (X2) and 'Extended diagnostic information notification request signal' (Y2) are used for the extended diagnostic information notification function. (☞ Page 26 Notification function of extended diagnostic information)
'Extended diagnostic information notification request signal' (Y2) is turned on from the program when the data in 'Extended diagnostic information area' (Un\G2041 to Un\G2053) is notified to the DP-Master.
When 'Extended diagnostic information notification request signal' (Y2) is turned on, the extended diagnostic information is notified to the DP-Master, and then 'Extended diagnostic information notification completed signal' (X2) turns on. However, while 'Data exchanging signal' (X1) is off, 'Extended diagnostic information notification request signal' (Y2) is ignored, and therefore 'Extended diagnostic information notification completed signal' (X2) does not turn on.
After 'Extended diagnostic information notification completed signal' (X2) turns on, turning off 'Extended diagnostic information notification request signal' (Y2) from the program will turn off 'Extended diagnostic information notification completed signal' (X2).

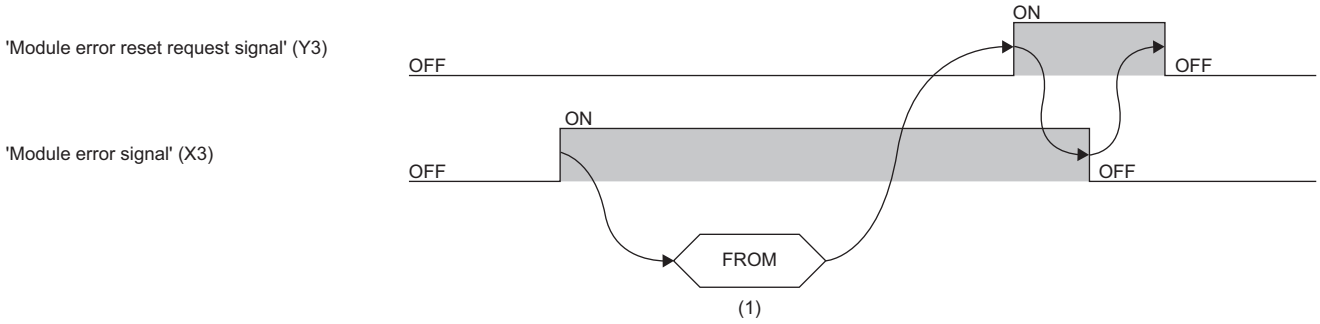
Error signals (X3) and (Y3)

■When 'Module error signal' (X3) turns on

- The ERR LED turns on or flashes.
- The error status and code are displayed in "Error Status" of the RJ71PB91V(S) in the "System Monitor" window.
- Detailed information on the current error is displayed on the [Error Information] tab of the "Module Diagnostics" window. (☞ Page 172 Error information)
- The error code is stored in 'Module error information' (Un\G2040).

■When 'Module error reset request signal' (Y3) is turned on from the program

- The ERR LED turns off.
- "—" appears in "Error Status" of the RJ71PB91V(S) in the "System Monitor" window.
- "No error" appears on the [Error Information] tab of the "Module Diagnostics" window.
- The error code stored in 'Module error information' (Un\G2040) is cleared.



(1) Error code is read from the buffer memory.

After 'Module error signal' (X3) turns off, turn off 'Module error reset request signal' (Y3) from the program.

Precautions

Only when 'Module error reset request signal' (Y3) is turned off and on, the error is reset.
Because the error detection stays enabled while 'Module error reset request signal' (Y3) is on, 'Module error signal' (X3) turns on. To reset the error, turn off and on 'Module error reset request signal' (Y3).

Global control functions (X5), (X6), and (X7)

■'During SYNC mode signal' (X5) and 'SYNC receive signal' (X6)

When the RJ71PB91V goes into the SYNC mode at the SYNC request from the DP-Master, 'During SYNC mode signal' (X5) and 'SYNC receive signal' (X6) turn on.

When the RJ71PB91V receives SYNC request from the DP-Master again during the SYNC mode, 'During SYNC mode signal' (X5) stays on and 'SYNC receive signal' (X6) turns on or off.

In the following cases, the SYNC mode exits, and 'During SYNC mode signal' (X5) and 'SYNC receive signal' (X6) turn off.

- Issuing of UNSYNC request from the DP-Master
- Resetting the CPU module
- Turning off of 'Data exchanging signal' (X1)

When the communication watchdog timer of the DP-Master is disabled, even if the DP-Master goes down, no errors occur and 'Data exchanging signal' (X1), 'During SYNC mode signal' (X5), and 'SYNC receive signal' (X6) do not turn off. (☞ Page 268 Current communication watchdog timer value (Un\G2257))

■'During FREEZE mode signal' (X7)

When the RJ71PB91V goes into the FREEZE mode at the FREEZE request from the DP-Master, 'During FREEZE mode signal' (X7) turns on.

In the following cases, the FREEZE mode exits, and 'During FREEZE mode signal' (X7) turns off.

- Issuing of UNFREEZE request from the DP-Master
- Resetting the CPU module
- Turning off of 'Data exchanging signal' (X1)

When the communication watchdog timer of the DP-Master is disabled, even if the communication with the DP-Master stops, 'Data exchanging signal' (X1) does not turn off. (☞ Page 268 Current communication watchdog timer value (Un\G2257))

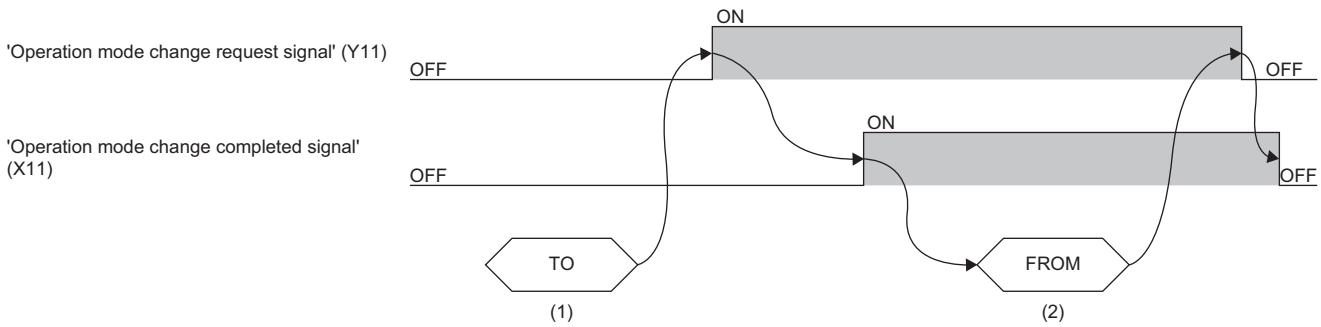
Operation mode change signals (X11) and (Y11)

'Operation mode change completed signal' (X11) and 'Operation mode change request signal' (Y11) are used for the operation mode changing function. (☞ Page 155 Program example for changing operation mode (self-diagnostics test))

1. Set 'Operation mode change request area' (Un\G2255) to the desired operation mode and turn on 'Operation mode change request signal' (Y11).
2. The RJ71PB91V changes the operation mode accordingly, and 'Operation mode change completed signal' (X11) turns on. (When the operation mode change request is issued during communication with the DP-Master, the RJ71PB91V stops communications and restarts in the changed operation mode.)
3. Check 'Operation mode change result area' (Un\G2256) and 'Current operation mode area' (Un\G2254) to see that the operation mode has been changed properly, and turn off 'Operation mode change request signal' (Y11).

When 'Operation mode change result area' (Un\G2256) completes with an error, preventing the operation mode from changing, check the setting of 'Operation mode change request area' (Un\G2255) and repeat steps 1 through 3 above.

When 'Operation mode change request signal' (Y11) is turned off, 'Operation mode change completed signal' (X11) turns off.



(1) Set 'Operation mode change request area' (Un\G2255) to the desired operation mode.

(2) Check 'Current operation mode area' (Un\G2254) and 'Operation mode change result area' (Un\G2256) to see the result.

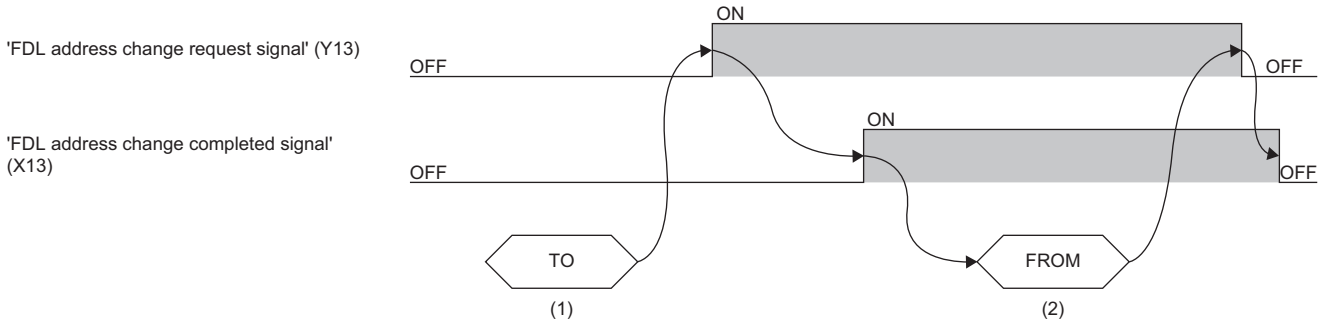
FDL address change signals (X13) and (Y13)

'FDL address change completed signal' (X13) and 'FDL address change request signal' (Y13) are used to change the local FDL address using the program. These signals are valid only in the normal operation mode (mode 0), and they are ignored in other modes.

1. Set 'FDL address change request area' (Un\G515) to the desired address and turn on 'FDL address change request signal' (Y13).
2. The local FDL address is changed, and 'FDL address change completed signal' (X13) turns on.
3. Check 'Operation FDL address' (Un\G513) and 'Module error information' (Un\G2040) to see that the FDL address has been changed, and turn off 'FDL address change request signal' (Y13).

When an error occurs in 'Module error information' (Un\G2040), preventing the FDL address from changing, check the setting of 'FDL address change request area' (Un\G515) and repeat steps 1 to 3 above.

When 'FDL address change request signal' (Y13) is turned off, 'FDL address change completed signal' (X13) turns off.



(1) Set 'FDL address change request area' (Un\G515) to the desired FDL address.
(2) Check 'Operation FDL address' (Un\G513) and 'Module error information' (Un\G2040) to see the result.

Module ready signal (X1D)

This signal turns on when the RJ71PB91V starts. (This signal turns on in any operation mode.)

The signal turns off when the following errors occur on the RJ71PB91V.

- Major error (Module watchdog timer error and hardware failure)
- Moderate error (Module parameter error)

Appendix 3 Buffer Memory of the DP-Master

The RJ71PB91V exchanges data with the CPU module through the buffer memory. Data in the buffer memory are reset to the defaults (initial values) when the CPU module is turned off or reset.

List of buffer memory addresses on DP-Master

This section lists buffer memory addresses when the RJ71PB91V is used as the DP-Master.

Address (decimal)	Address (hexadecimal)	Name	Description	Initial value	Read, write
0 to 2079	0H to 81FH	System area			
2080	820H	Diagnostic information invalid setting area	Sets a value to mask (invalidate) diagnostic information from a DP-Slave.	02B9H	Read, write
2081	821H	Global control area	Specifies a global control function to run.	0	Read, write
2082 to 2083	822H to 823H	System area			
2084	824H	Diagnostic information non-notification time setting area	Specifies the duration after the start of data exchange during which diagnostic information is not notified.	20	Read, write
2085	825H	Current diagnostic information non-notification time area	Stores the duration (remaining time period) after the start of data exchange during which diagnostic information is not notified.	0	Read
2086 to 2253	826H to 8CDH	System area			
2254	8CEH	Current operation mode area	Stores the current operation mode.	*1	Read
2255	8CFH	Operation mode change request area	Sets operation mode to which the module switches when operation mode change request is issued.	FFFEH	Read, write
2256	8D0H	Operation mode change result area	Stores the result of operation mode change request.	0	Read
2257	8D1H	Local FDL address display area	Stores the FDL address for local FDL address.	*1	Read
2258	8D2H	Offline test status area	When the self-diagnostics test or initialization of the flash ROM is being performed or when an error is detected, the corresponding code will be stored.	0	Read
2259 to 2262	8D3H to 8D6H	System area			
2263	8D7H	Control master FDL address display area	Stores the FDL address of the DP-Master of the control system.	FFFFH	Read
2264	8D8H	Standby master FDL address display area	Stores the FDL address of the DP-Master of the standby system.	FFFFH	Read
2265 to 2271	8D9H to 8DFH	System area			
2272	8E0H	Current bus cycle time	Stores the current bus cycle time.	0	Read
2273	8E1H	Minimum bus cycle time	Stores the minimum bus cycle time.	0	Read
2274	8E2H	Maximum bus cycle time	Stores the maximum bus cycle time.	0	Read
2275 to 6143	8E3H to 17FFH	System area			
6144 to 10239	1800H to 27FFH	Input data area (for mode 3)	Stores input data from DP-Slaves when operation mode is communication mode (mode 3).	0	Read
10240 to 14335	2800H to 37FFH	System area			
14336 to 18431	3800H to 47FFH	Output data area (for mode 3)	Sets output data to DP-Slaves when operation mode is communication mode (mode 3).	0	Read, write
18432 to 22527	4800H to 57FFH	System area			
22528 to 22777	5800H to 58F9H	Address information area (for mode 3)	Stores the FDL address and I/O data length of DP-Slaves when operation mode is communication mode (mode 3).	FFFFH	Read
22778 to 22783	58FAH to 58FFH	System area			
22784 to 22908	5900H to 597CH	Input data start address area (for mode 3)	Stores the start address (buffer memory address) for input data from DP-Slaves when operation mode is communication mode (mode 3).	0	Read
22909 to 22911	597DH to 597FH	System area			
22912 to 23036	5980H to 59FCH	Output data start address area (for mode 3)	Stores the start address (buffer memory address) for output data to DP-Slaves when t operation mode is communication mode (mode 3).	0	Read
23037 to 23039	59FDH to 59FFH	System area			

A

Address (decimal)	Address (hexadecimal)	Name	Description	Initial value	Read, write
23040 to 23047	5A00H to 5A07H	Slave status area (Normal communication detection)	Stores the communication status of DP-Slaves.	0	Read
23048 to 23055	5A08H to 5A0FH	Slave status area (Reserved station setting status)	Stores reserved station settings or temporarily reserved station settings for DP-Slaves.	0	Read
23056 to 23064	5A10H to 5A18H	Slave status area (Diagnostic information detection)	Stores diagnostic information detection status of DP-Slaves.	0	Read
23065 to 23070	5A19H to 5A1EH	System area			
23071	5A1FH	Local FDL address error information area	Stores the error information on local FDL address.	0	Read
23072 to 23321	5A20H to 5B19H	Diagnostic information area (for mode 3)	Stores diagnostic information on DP-Slaves generated during communications when operation mode is communication mode (mode 3).	0	Read
23322 to 23327	5B1AH to 5B1FH	System area			
23328 to 23454	5B20H to 5B9EH	Extended diagnostic information area (for mode 3)	Stores the latest extended diagnostic information on DP-Slaves generated during communications when operation mode is communication mode (mode 3).	0	Read
23455	5B9FH	System area			
23456	5BA0H	Extended diagnostic information read request area	Sets the FDL address from which extended diagnostic information is acquired.	FFFFH	Read, write
23457 to 23583	5BA1H to 5C1FH	Extended diagnostic information read response area	Stores the result of the extended diagnostic information read request.	0	Read
23584 to 23591	5C20H to 5C27H	Parameter setting status area (Active station)	Stores the DP-Slave set as normal DP-Slaves by slave parameters.	0	Read
23592 to 23599	5C28H to 5C2FH	Parameter setting status area (Reserved station)	Stores the DP-Slaves set as reserved stations by the slave parameter.	0	Read
23600 to 23607	5C30H to 5C37H	Temporarily reserved station specification status area	Stores the DP-Slaves specified as a temporarily reserved station by the temporarily reserved station specification function.	0	Read
23608 to 23615	5C38H to 5C3FH	Temporarily reserved station specification request area	Sets which DP-Slaves are to be specified as temporarily reserved stations by the temporarily reserved station specification function.	0	Read, write
23616 to 23647	5C40H to 5C5FH	System area			
23648	5C60H	System switching condition setting	Sets system switching conditions.	0	Write
23649 to 23656	5C61H to 5C68H	System switching DP-Slave specification	Specifies DP-Slaves for system switching.	0	Write
23657 to 23663	5C69H to 5C6FH	System area			
23664	5C70H	System switching condition setting results	Stores system switching condition setting results.	0	Read
23665 to 23672	5C71H to 5C78H	System switching DP-Slave specification results	Stores the specification results of the DP-Slaves for system switching.	0	Read
23673 to 23807	5C79H to 5CFFH	System area			
23808	5D00H	Acyclic communication request execution instruction area	Turn on bits of acyclic communication function that are relevant to the request instruction numbers to execute.	0	Read, write
23809 to 24832	5D01H to 6100H	Acyclic communication request area	Write the request instruction data to be executed by the acyclic communication function.	0	Read, write
24833 to 25119	6101H to 621FH	System area			
25120	6220H	Acyclic communication request result area	Turns the appropriate bits on for the request acceptance status and the execution completed status of the acyclic communication function.	0	Read
25121 to 26144	6221H to 6620H	Acyclic communication response area	Stores the request execution results of the acyclic communication function.	0	Read
26145 to 26415	6621H to 672FH	System area			
26416 to 26424	6730H to 6738H	Slave status area (Alarm detection)	Stores the alarm status of DP-Slaves.	0	Read
26425 to 26431	6739H to 673FH	System area			
26432 to 26434	6740H to 6742H	Alarm request area	Sets alarm acquisition request data.	0	Read, write
26435 to 26445	6743H to 674DH	System area			
26446 to 26768	674EH to 6890H	Alarm response area	Stores the result of alarm acquisition.	0	Read

Address (decimal)	Address (hexadecimal)	Name	Description	Initial value	Read, write
26769 to 26783	6891H to 689FH	System area			
26784 to 26792	68A0H to 68A8H	Time control setting request area	Specifies time control request data.	0	Read, write
26793 to 26799	68A9H to 68AFH	System area			
26800 to 26812	68B0H to 68BCH	Time control setting response area	Stores the result of time control.	0	Read
26813 to 65535	68BDH to FFFFH	System area			

*1 The initial value changes depending on the CPU module mounting the RJ71PB91V or the relevant parameter(s).

Point

Do not write data to "System area". Doing so may cause malfunction of the programmable controller system.

List of buffer memory addresses and global labels on DP-Master

To use global labels, update the PROFIBUS label using the PROFIBUS Configuration Tool. (☞ Page 86 Update PROFIBUS Label)

Name		Global label
Diagnostic information invalid setting area (Un\G2080)		glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoInvalid_D
Global control area (Un\G2081)		glRJ71PB91V_1.stMgmtOutputs_D.uSet_GlobalControl_D
Diagnostic information non-notification time setting area (Un\G2084)		glRJ71PB91V_1.stMgmtOutputs_D.uSet_DiagnosticInfoNon_notificationTime_D
Current diagnostic information non-notification time area (Un\G2085)		glRJ71PB91V_1.stMgmtInputs_D.uVal_CurrentDiagnosticInfoNon_notificationTime_D
Current operation mode area (Un\G2254)		glRJ71PB91V_1.stMgmtInputs_D.uSts_CurrentOperationMode_D
Operation mode change request area (Un\G2255)		glRJ71PB91V_1.stMgmtOutputs_D.uSet_OperationModeChange_D
Operation mode change result area (Un\G2256)		glRJ71PB91V_1.stMgmtInputs_D.uRslt_OperationModeChange_D
Local FDL address display area (Un\G2257)		glRJ71PB91V_1.stMgmtInputs_D.uVal_Local_FDL_Address_D
Offline test status area (Un\G2258)		glRJ71PB91V_1.stMgmtInputs_D.uSts_OfflineTest_D
Control master FDL address display area (Un\G2263)		glRJ71PB91V_1.stMgmtInputs_D.uVal_Control_Master_FDL_Address_D
Standby master FDL address display area (Un\G2264)		glRJ71PB91V_1.stMgmtInputs_D.uVal_Standby_Master_FDL_Address_D
Current bus cycle time (Un\G2272)		glRJ71PB91V_1.stMgmtInputs_D.uVal_CurrentBusCycleTime_D
Minimum bus cycle time (Un\G2273)		glRJ71PB91V_1.stMgmtInputs_D.uVal_MinBusCycleTime_D
Maximum bus cycle time (Un\G2274)		glRJ71PB91V_1.stMgmtInputs_D.uVal_MaxBusCycleTime_D
Input data area (for mode 3) (Un\G6144 to Un\G10239)		glRJ71PB91V_1.stMgmtInputs_D.unInputDataArea
Output data area (for mode 3) (Un\G14336 to Un\G18431)		glRJ71PB91V_1.stMgmtOutputs_D.unOutputDataArea
Address information area (for mode 3) (Un\G22528 to Un\G22777)		glRJ71PB91V_1.stMgmtInputs_D.stnAddressInformationArea
Input data start address area (for mode 3) (Un\G22784 to Un\G22908)		glRJ71PB91V_1.stMgmtInputs_D.unVal_InputDataStartAddress_D
Output data start address area (for mode 3) (Un\G22912 to Un\G23036)		glRJ71PB91V_1.stMgmtInputs_D.unVal_OutputDataStartAddress_D
Slave status area (Normal communication detection) (Un\G23040 to Un\G23047)		glRJ71PB91V_1.stMgmtInputs_D.b128CommunicationStatus_D
Slave status area (Reserved station setting) (Un\G23048 to Un\G23055)		glRJ71PB91V_1.stMgmtInputs_D.b128ReservedStationStatus_D
Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064)	All stations' diagnostic status (Un\G23056)	glRJ71PB91V_1.stMgmtInputs_D.uAllStationDiagnosticStatus_D
	Each station's diagnostic status (Un\G23057 to Un\G23064)	glRJ71PB91V_1.stMgmtInputs_D.b128StationDiagnosticStatus_D
Local station error information area (Un\G23071)		glRJ71PB91V_1.stMgmtInputs_D.uSts_LocalStationErrorInformation_D
Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)		glRJ71PB91V_1.stDiagnosticsInfo_D.u250DiagInfoArea_D
Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)	FDL address of DP-Slave (Un\G23328)	glRJ71PB91V_1.stMgmtInputs_D.stExtendedDiagnosticInformationArea.uVal_DP_Slave_FDL_Address_D
	Size (Un\G23329)	glRJ71PB91V_1.stMgmtInputs_D.stExtendedDiagnosticInformationArea.uVal_ExtendedDiagnosticInformationDataSize
	Status 1 + status 2 (Un\G23330)	glRJ71PB91V_1.stMgmtInputs_D.stExtendedDiagnosticInformationArea.unExtendedDiagnosticInformation_D
	Status 3 + FDL address of DP-Master (Un\G23331)	
	Ident No. (Un\G23332)	
	Extended diagnostic information (Un\G23333 to Un\G23454)	
Extended diagnostic information read request area (Un\G23456)		glRJ71PB91V_1.stExtDiagnosticsRequest_D.uFDLAddressSlave_D
Extended diagnostic information read response area (Un\G23457 to Un\G23583)	Read results code (Un\G23457)	glRJ71PB91V_1.stExtDiagnosticsResult_D.uReadResult_D
	Size (Un\G23458)	glRJ71PB91V_1.stExtDiagnosticsResult_D.wDataLength_D
	Status 1 + status 2 (Un\G23459)	glRJ71PB91V_1.stExtDiagnosticsResult_D.b8Status1_D
		glRJ71PB91V_1.stExtDiagnosticsResult_D.b8Status2_D
	Status 3 + FDL address of DP-Master (Un\G23460)	glRJ71PB91V_1.stExtDiagnosticsResult_D.bMoreExtDiagInfo_D
		glRJ71PB91V_1.stExtDiagnosticsResult_D.b8FDLAddressMaster_D
	Ident No. (Un\G23461)	glRJ71PB91V_1.stExtDiagnosticsResult_D.uSlaveID_D
	Extended diagnostic information (Un\G23462 to Un\G23583)	glRJ71PB91V_1.stExtDiagnosticsResult_D.u122ExtDiagInfo_D

Name			Global label
Parameter setting status area (Active station) (Un\G23584 to Un\G23591)			glRJ71PB91V_1.stMgmtInputs_D.stParameterSettingStatusArea.bnSts_ActiveStation_D
Parameter setting status area (Reserved station) (Un\G23592 to Un\G23599)			glRJ71PB91V_1.stMgmtInputs_D.stParameterSettingStatusArea.bnSts_ReservedStation_D
Temporarily reserved station specification status area (Un\G23600 to Un\G23607)			glRJ71PB91V_1.stMgmtInputs_D.bnSts_TemporarySlaveReservation_D
Temporarily reserved station specification request area (Un\G23608 to Un\G23615)			glRJ71PB91V_1.stMgmtOutputs_D.bnReqTemporarySlaveReservation_D
System switching condition setting (Un\G23648)			glRJ71PB91V_1.stMgmtOutputs_D.uVal_System_Switching_Condition_Setting_D
System switching DP-Slave specification (Un\G23649 to Un\G23656)			glRJ71PB91V_1.stMgmtOutputs_D.bnVal_System_Switching_DP_Slave_Specification_D
System switching condition setting results (Un\G23664)			glRJ71PB91V_1.stMgmtInputs_D.uVal_System_Switching_Condition_Setting_Result_D
System switching DP-Slave specification results (Un\G23665 to Un\G23672)			glRJ71PB91V_1.stMgmtInputs_D.bnVal_System_Switching_DP_Slave_Specification_Result_D
Acyclic communication request execution instruction area (Un\G23808)			glRJ71PB91V_1.stMgmtOutputs_D.b8ServiceExecutionRequest_D
Acyclic communication request area (Un\G23809 to Un\G24832)	Request instruction No.1 area	Request code (Un\G23809)	glRJ71PB91V_1.stServiceIFRequestArea1_D.uRequestID_D
		Request data 1 (Un\G23810)	glRJ71PB91V_1.stServiceIFRequestArea1_D.uDeviceID_D
		Request data 2 (Un\G23811)	glRJ71PB91V_1.stServiceIFRequestArea1_D.wDataLength_D
		Request data 3 (Un\G23812)	glRJ71PB91V_1.stServiceIFRequestArea1_D.uSlotNumber_D
		Request data 4 (Un\G23813)	glRJ71PB91V_1.stServiceIFRequestArea1_D.uIndex_D
		Request data 5 (from Un\G23814 to Un\G23933)	glRJ71PB91V_1.stServiceIFRequestArea1_D.u120RequestData_D
	Request instruction No.2 area	Request code (Un\G23937)	glRJ71PB91V_1.stServiceIFRequestArea2_D.uRequestID_D
		Request data 1 (Un\G23938)	glRJ71PB91V_1.stServiceIFRequestArea2_D.uDeviceID_D
		Request data 2 (Un\G23939)	glRJ71PB91V_1.stServiceIFRequestArea2_D.wDataLength_D
		Request data 3 (Un\G23940)	glRJ71PB91V_1.stServiceIFRequestArea2_D.uSlotNumber_D
		Request data 4 (Un\G23941)	glRJ71PB91V_1.stServiceIFRequestArea2_D.uIndex_D
		Request data 5 (from Un\G23942 to Un\G24061)	glRJ71PB91V_1.stServiceIFRequestArea2_D.u120RequestData_D
	⋮		
	Request instruction No.8 area	Request code (Un\G24705)	glRJ71PB91V_1.stServiceIFRequestArea8_D.uRequestID_D
		Request data 1 (Un\G24706)	glRJ71PB91V_1.stServiceIFRequestArea8_D.uDeviceID_D
		Request data 2 (Un\G24707)	glRJ71PB91V_1.stServiceIFRequestArea8_D.wDataLength_D
		Request data 3 (Un\G24708)	glRJ71PB91V_1.stServiceIFRequestArea8_D.uSlotNumber_D
		Request data 4 (Un\G24709)	glRJ71PB91V_1.stServiceIFRequestArea8_D.uIndex_D
		Request data 5 (from Un\G24710 to Un\G24829)	glRJ71PB91V_1.stServiceIFRequestArea8_D.u120RequestData_D
Acyclic communication request result area (Un\G25120)	Completed status bit (Un\G25120.b0 to Un\G25120.b7)		glRJ71PB91V_1.stMgmtInputs_D.b8ServiceExecutionAccepted_D
	Reception status bit (Un\G25120.b8 to Un\G25120.b15)		glRJ71PB91V_1.stMgmtInputs_D.b8ServiceExecutionCompleted_D

Name			Global label
Acyclic communication response area (Un\G25121 to Un\G26144)	Request instruction No.1 area	Response code (Un\G25121)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.uResponseID_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.uErrorID_D
		Response data 1 (Un\G25122)	glRJ71PB91V_1.stServiceIFResponseArea1_D.uDeviceID_D
		Response data 2 (Un\G25123)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.wDataLength_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.uDetailedErrorID1_D
		Response data 3 (Un\G25124)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.uSlotNumber_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.uDetailedErrorID2_D
		Response data 4 (Un\G25125)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.uIndex_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea1_D.uDetailedErrorID3_D
		Response data 5 (Un\G25126)	glRJ71PB91V_1.stServiceIFResponseArea1_D.u120ResponseData_D
	Request instruction No.2 area	Response code (Un\G25249)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.uResponseID_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.uErrorID_D
		Response data 1 (Un\G25250)	glRJ71PB91V_1.stServiceIFResponseArea2_D.uDeviceID_D
		Response data 2 (Un\G25251)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.wDataLength_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.uDetailedErrorID1_D
		Response data 3 (Un\G25252)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.uSlotNumber_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.uDetailedErrorID2_D
		Response data 4 (Un\G25253)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.uIndex_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea2_D.uDetailedErrorID3_D
		Response data 5 (Un\G25254)	glRJ71PB91V_1.stServiceIFResponseArea2_D.u120ResponseData_D
	⋮		
	Request instruction No.8 area	Response code (Un\G26017)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.uResponseID_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.uErrorID_D
		Response data 1 (Un\G26018)	glRJ71PB91V_1.stServiceIFResponseArea8_D.uDeviceID_D
		Response data 2 (Un\G26019)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.wDataLength_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.uDetailedErrorID1_D
		Response data 3 (Un\G26020)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.uSlotNumber_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.uDetailedErrorID2_D
		Response data 4 (Un\G26021)	• Normal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.uIndex_D • Abnormal response: glRJ71PB91V_1.stServiceIFResponseArea8_D.uDetailedErrorID3_D
		Response data 5 (Un\G26022)	glRJ71PB91V_1.stServiceIFResponseArea8_D.u120ResponseData_D
Slave status area (Alarm detection) (Un\G26416 to Un\G26424)	All stations' alarm status (Un\G26416)		glRJ71PB91V_1.stMgmtInputs_D.uAllStationAlarmStatus_D
	Each stations' alarm status (Un\G26417 to Un\G26424)		glRJ71PB91V_1.stMgmtInputs_D.b128StationAlarmStatus_D
Alarm request area (Un\G26432 to Un\G26434)	Request code (Un\G26432)		glRJ71PB91V_1.stAlarmRequest_D.uRequestCode_D
	FDL address (Un\G26433)		glRJ71PB91V_1.stAlarmRequest_D.wFDLAddressSlave_D
	For Alarm ACK request only Alarm No. (Un\G26434)		• Alarm ACK request: glRJ71PB91V_1.stAlarmRequest_D.b8AlarmAck_D • Alarm read request: glRJ71PB91V_1.stAlarmRequest_D.b8Reserved_D

Name			Global label
Alarm response area (Un\G26446 to Un\G26768)	Response code (Un\G26446)		glRJ71PB91V_1.stAlarmResult_D.uResponseCode_D
	FDL address (Un\G26447)		glRJ71PB91V_1.stAlarmResult_D.wFDLAddressSlave_D
	Completed status (Un\G26448)		glRJ71PB91V_1.stAlarmResult_D.b16ReadAckStatus_D
	Alarm No.1 (Normal response)	Alarm data length (Un\G26449)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.wDataLength_D
		Alarm type (Un\G26450)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.uType_D
		Alarm slot number (Un\G26451)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.wSlotNo_D
		Alarm details (Un\G26452)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.b2DetailCategory_D
			glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.bAckRequired_D
			glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.b5SequenceNo_D
			glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.b8Reserved_D
		Alarm data (Un\G26453 to Un\G26484)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.u32Data_D
		ACK Normal response code (Un\G26485)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.uResponseCodeAck_D
		ACK Alarm type (Un\G26486)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.uTypeAck_D
		ACK Details (Un\G26487)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.b2DetailCategoryAck_D
			glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.bAckRequiredAck_D
			glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.b5SequenceNoAck_D
			glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.b8ReservedAck_D
		ACK slot number (Un\G26488)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk1_D.wSlotNoAck_D
	Alarm No.1 (Abnormal response)	Alarm details status code 1 (Un\G26449)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr1_D.uDetailedErrCode1_D
		Alarm details status code 2 (Un\G26450)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr1_D.uDetailedErrCode2_D
		Alarm details status code 3 (Un\G26451)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr1_D.uDetailedErrCode3_D
		ACK Abnormal response code (Un\G26485)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr1_D.uErrorCodeAck_D
		ACK details status code 1 (Un\G26486)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr1_D.uDetailedErrCode1Ack_D
		ACK details status code 2 (Un\G26487)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr1_D.uDetailedErrCode2Ack_D
		ACK details status code 3 (Un\G26488)	glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr1_D.uDetailedErrCode3Ack_D
	Alarm No.2	(Un\G26489 to Un\G26528)	Normal response: glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk2_D.... Abnormal response: glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr2_D....
	⋮		
	Alarm No.8	(Un\G26729 to Un\G26768)	Normal response: glRJ71PB91V_1.stAlarmResult_D.stAlarmDataOk8_D.... Abnormal response: glRJ71PB91V_1.stAlarmResult_D.stAlarmDataErr8_D....
Time control setting request area (Un\G26784 to Un\G26792)	Request code (Un\G26784)		glRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.uSet_RequestCode_D
	Request data (Un\G26785 to Un\G26792)		glRJ71PB91V_1.stMgmtOutputs_D.stTimeControlSettingRequestArea.unRequestData_D
Time control setting response area (Un\G26800 to Un\G26812)	Response code (Un\G26800)		glRJ71PB91V_1.stMgmtInputs_D.stTimeControlSettingResponseArea.uRslt_ResponseCode_D
	Response data (Un\G26801 to Un\G26812)		glRJ71PB91V_1.stMgmtInputs_D.stTimeControlSettingResponseArea.unResponseData_D

Details of buffer memory addresses on DP-Master

This section describes details of buffer memory addresses when the RJ71PB91V is used as the DP-Master.

Diagnostic information invalid setting area

■Diagnostic information invalid setting area (Un\G2080)

This area sets a value to mask (invalidate) pieces of diagnostic information sent from DP-Slaves during communications.

- 0: Validate the diagnostic information.
- 1: Invalidate the diagnostic information.

Address	Bit	Description	Initial value
Un\G2080	b0	Parameter send request from DP-Slaves	1
	b1	A malfunction occurred in the DP-Slave.	0
	b2	0 (fixed)	0
	b3	A DP-Slave is monitoring the communication watchdog timer.	1
	b4	1 (fixed)	1
	b5	1 (fixed)	1
	b6	0 (Reserved)	0
	b7	A parameter setting excluded the station from I/O data exchanges.	1
	b8	I/O data exchanges with a DP-Slave failed.	0
	b9	A DP-Slave is not ready for I/O data exchanges.	1
	b10	The I/O bytes parameter received from the DP-Master does not match that of a DP-Slave.	0
	b11	Extended diagnostic information exists.	0
	b12	The function requested by the DP-Master is not supported.	0
	b13	An invalid response from a DP-Slave.	0
	b14	An invalid parameter from the DP-Master.	0
	b15	The station is controlled by another DP-Master.	0

When diagnostic information corresponding to the bits above occurs on a DP-Slave, the DP-Master does not recognize the information as diagnostic information and results in the following status.

- 'Diagnostic information detection signal' (X1) does not turn on.
- BF LED does not turn on.
- The error code and detailed data are not stored in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) or 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454).
- Bit in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) relevant to the station that sent the diagnostic information does not turn on.

Point

Configure the values of 'Diagnostic information invalid setting area' (Un\G2080) when 'Data exchange start request signal' (Y0) is off.
Any value configured while 'Data exchange start request signal' (Y0) is on will be ignored.

Global control function

■Global control area (Un\G2081)

This area sets a global control function to be run. (☞ Page 28 Global Control Function)

Set the global control function services sent to global control areas b2 to b5, and set the target group numbers at b8 to b15.

- 0: Do not execute the instruction.
- 1: Execute the instruction.

Address	Bit	Description	Initial value
Un\G2081	b0	Not used (fixed to 0)	0
	b1	Not used (fixed to 0)	0
	b2	Send the UNFREEZE service.	0
	b3	Send the FREEZE service.	0
	b4	Send the UNSYNC service.	0
	b5	Send the SYNC service.	0
	b6	Not used (fixed to 0)	0
	b7	Not used (fixed to 0)	0
	b8	Apply a service(s) to DP-Slaves in group 1.	0
	b9	Apply a service(s) to DP-Slaves in group 2.	0
	b10	Apply a service(s) to DP-Slaves in group 3.	0
	b11	Apply a service(s) to DP-Slaves in group 4.	0
	b12	Apply a service(s) to DP-Slaves in group 5.	0
	b13	Apply a service(s) to DP-Slaves in group 6.	0
	b14	Apply a service(s) to DP-Slaves in group 7.	0
	b15	Apply a service(s) to DP-Slaves in group 8.	0

Point

The following services cannot be executed simultaneously.

- SYNC and UNSYNC (Executing them simultaneously will only activate UNSYNC.)
- FREEZE and UNFREEZE (Executing them simultaneously will only activate UNFREEZE.)

The target group number bits allow configuring multiple group numbers. Setting all bits from b8 to b15 to 0 sends a global control function service to all DP-Slaves (including ones that are not assigned with a group number).

A

Diagnostic information non-notification time

■Diagnostic information non-notification time setting area (Un\G2084)

This area specifies the duration after the start of data exchange (after 'Data exchange start completed signal' (X0) turns on) during which any diagnostic information is not notified.

Address	Setting value	Description
Un\G2084	0 to 65535	Sets the duration during which diagnostic information is not notified. (Unit: second)

This setting allows temporary deactivation of error detection such as a DP-Slave is turned on after the RJ71PB91V is powered on.

Generation of diagnostic information within the specified duration leads to the following state.

- 'Diagnostic information detection signal' (X1) does not turn on.
- BF LED does not turn on.
- The error code and detailed data are not stored in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) or 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454).
- Bit in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064) relevant to the station that sent the diagnostic information does not turn on.

Point

- Configure the value of 'Diagnostic information non-notification time setting area' (Un\G2084) when 'Data exchange start request signal' (Y0) is off. Any value configured while 'Data exchange start request signal' (Y0) is on will be ignored.
- 'Current diagnostic information non-notification time area' (Un\G2085) allows viewing the duration (remaining time period) after the start of data exchange (after 'Data exchange start completed signal' (X0) turns on) during which diagnostic information is not notified. (☞ Page 222 Current diagnostic information non-notification time area (Un\G2085))

■Current diagnostic information non-notification time area (Un\G2085)

This area stores the duration (remaining time period) after the start of data exchange (after 'Data exchange start completed signal' (X0) turns on) during which any diagnostic information is not notified.

The duration during which diagnostic information is not notified is configured through 'Diagnostic information non-notification time setting area' (Un\G2084).

Address	Setting value	Description
Un\G2085	0 to 65535	Stores the duration (remaining time period) during which diagnostic information is not notified. The stored value is decremented. (Unit: second) No diagnostic information is notified until it is decremented to 0.

After data exchange starts ('Data exchange start completed signal' (X0) turns on), if time period specified in 'Diagnostic information non-notification time setting area' (Un\G2084) elapses, 'Current diagnostic information non-notification time area' (Un\G2085) is set to 0.

After data exchange stops ('Data exchange start request signal' (Y0) is turned off), the remaining time stays unchanged until 'Data exchange start request signal' (Y0) is turned on next time.

Operation mode

■Current operation mode area (Un\G2254)

This area stores the current operation mode. (☞ Page 45 Operation Mode Changing Function)

Address	Stored value	Description
Un\G2254	0001H	Parameter setting mode (mode 1)
	0002H	Self-diagnostic mode (mode 2)
	0003H	Communication mode (mode 3)
	0009H	Flash ROM clear mode

■Operation mode change request area (Un\G2255)

This area sets operation mode to which the module switches when operation mode change request is issued.

When 'Operation mode change request area' (Un\G2255) is set to the initial value (FFFEH), if 'Operation mode change request signal' (Y11) is turned on, 'Operation mode change result area' (Un\G2256) is set to E300H, which does not change operation mode.

Address	Stored value	Description
Un\G2255	0002H	Sets operation mode to self-diagnostic mode (mode 2).
	0009H	Sets operation mode to flash ROM clear mode.
	FFFEH	This value is to prevent faulty operation. (Initial value)

■Operation mode change result area (Un\G2256)

This area stores the result of operation mode change request.

Address	Stored value	Description
Un\G2256	A300H	Completed successfully
	Other than A300H	Completed with an error (☞ Page 185 List of Status Codes)

Local FDL address display area

■Local FDL address display area (Un\G2257)

This area stores the local FDL address.

Address	Stored value	Description
Un\G2257	0000H to 007DH	Current local FDL address (DP-Master) (0 to 125) In the redundant system, the current local FDL address (the DP-Master of the control or standby system) (0 to 125)
	FFFFH	The parameter is not configured

FDL address display area (redundant system)

■Control master FDL address display area (Un\G2263)

This area stores "FDL address" set in the "Master Settings" window of PROFIBUS Configuration Tool.

Address	Stored value	Description
Un\G2263	0000H to 007DH	FDL address set to the DP-Master of the control system in the redundant system (0 to 125)
	FFFFH	The parameter is not configured

■Standby master FDL address display area (Un\G2264)

This area stores "Standby System Master FDL Address" set in the "Module Parameter" window of the engineering tool.

Address	Stored value	Description
Un\G2264	0000H to 007DH	FDL address set to the DP-Master of the standby system in the redundant system (0 to 125)
	FFFFH	The parameter is not configured

Offline test

■Offline test status area (Un\G2258)

When the self-diagnostics test or initialization of the flash ROM is being performed or when an error is detected, the corresponding code will be stored. (☞ Page 174 Offline test, Page 181 List of Error Codes, Page 185 List of Status Codes)

Address	Stored value		Item	Description
	Execution (normal code)	Error (status code)		
Un\G2258	07FFH	—	Offline test	Completed successfully
	0700H	3E80H	Self-diagnostic test	ROM check test
	0701H	3E81H		Timer test
	0702H	3E82H		MPU test
	0703H	3E83H		RAM test
	0704H	3E84H		2-port RAM test
	0705H	3E85H		Swap port test
	0708H	3E87H	Initialization of flash ROM	Flash ROM test

Bus cycle time

■Current bus cycle time (Un\G2272)

This area stores the current bus cycle time. (Unit: × 1ms) (☞ Page 272 Bus cycle time)

■Minimum bus cycle time (Un\G2273)

This area stores the minimum bus cycle time. (Unit: × 1ms)

■Maximum bus cycle time (Un\G2274)

This area stores the maximum bus cycle time. (Unit: × 1ms)

Input data area (for mode 3)

■Input data area (for mode 3) (Un\G6144 to Un\G10239)

This area stores input data from DP-Slaves when operation mode is communication mode (mode 3). (☞ Page 21 I/O data exchanges on DP-Master)

• Data length settings

Each station is assigned with a variable data length (in byte) according to the slave parameters configured with PROFIBUS Configuration Tool (the "Slave Modules" window).

However, the DP-Slaves with a fixed data length is assigned it regardless of the slave parameters (the "Slave Modules" window) setting.

• Range of data length

Data length can be set 244 bytes maximum per station and to 8192 bytes maximum in total for all the DP-Slaves.

When data length is set to an odd number of bytes, 00H are stored in the last upper byte.

Input data from the next station is assigned from the next buffer memory address.

Ex.

1st station: 23 bytes, 2nd station: 7 bytes

Address	Sorting order of stored data		Stored input data
	b8 to b15	b0 to b7	
Un\G6144	The 2nd byte for the 1st station	The 1st byte for the 1st station	Input data from the 1st station (Input data length: 23 bytes)
Un\G6145	The 4th byte for the 1st station	The 3rd byte for the 1st station	
⋮			
Un\G6155	The 22nd byte for the 1st station	The 21st byte for the 1st station	
Un\G6156	00H	The 23rd byte for the 1st station	
Un\G6157	The 2nd byte for the 2nd station	The 1st byte for the 2nd station	Input data from the 2nd station (Input data length: 7 bytes)
Un\G6158	The 4th byte for the 2nd station	The 3rd byte for the 2nd station	
Un\G6159	The 6th byte for the 2nd station	The 5th byte for the 2nd station	
Un\G6160	00H	The 7th byte for the 2nd station	
⋮			
to Un\G10239			Input data from the nth station

Point

I/O data is assigned in the order of parameters configured with PROFIBUS Configuration Tool (order of FDL address).

Modifying the parameters with PROFIBUS Configuration Tool (adding or deleting a DP-Slave) causes the buffer memory areas to be reassigned. Review the program after modifying the parameters.

When data length is set to an odd number of bytes, upper byte leaves empty and the data from the next station are assigned from the subsequent even address.

'Input data area (for mode 3)' (Un\G6144 to Un\G10239) cannot be assigned to the following DP-Slaves. The addresses for them are assigned to the DP-Slaves subsequent to them instead.

• DP-Slaves without an input data length assigned

• DP-Slaves with an input data length of 0 bytes assigned

Output data area (for mode 3)

■Output data area (for mode 3) (Un\G14336 to Un\G18431)

This area sets output data sent to DP-Slaves when operation mode is communication mode (mode 3). (☞ Page 21 I/O data exchanges on DP-Master)

• Data length settings

Each station is assigned with a variable data length (in byte) according to the slave parameters configured with PROFIBUS Configuration Tool (the "Slave Modules" window).

However, the DP-Slaves with a fixed data length is assigned it regardless of the slave parameters (the "Slave Modules" window) setting.

• Range of data length

Data length can be set 244 bytes maximum per station and to 8192 bytes maximum in total for all the DP-Slaves.

When data length is set to an odd number of bytes, the last upper bytes are occupied.

Set to 00H for the last upper bytes.

Output data to the next station is assigned from the next buffer memory address.

Ex.

1st station: 23 bytes, 2nd station: 7 bytes

Address	Sorting order of stored data		Stored output data
	b8 to b15	b0 to b7	
Un\G14336	The 2nd byte for the 1st station	The 1st byte for the 1st station	Output data to the 1st station (Output data length: 23 bytes)
Un\G14337	The 4th byte for the 1st station	The 3rd byte for the 1st station	
⋮			
Un\G14347	The 22nd byte for the 1st station	The 21st byte for the 1st station	
Un\G14348	00H	The 23rd byte for the 1st station	
Un\G14349	The 2nd byte for the 2nd station	The 1st byte for the 2nd station	Output data to the 2nd station (Output data length: 7 bytes)
Un\G14350	The 4th byte for the 2nd station	The 3rd byte for the 2nd station	
Un\G14351	The 6th byte for the 2nd station	The 5th byte for the 2nd station	
Un\G14352	00H	The 7th byte for the 2nd station	
⋮			
to Un\G18431			Input data from the nth station

Point

I/O data is assigned in the order of parameters configured with PROFIBUS Configuration Tool (order of FDL address).

Modifying the parameters with PROFIBUS Configuration Tool (adding or deleting a DP-Slave) causes the buffer memory areas to be reassigned. Review the program after modifying the parameters.

When data length is set to an odd number of bytes, upper byte leaves empty and the data from the next station are assigned from the subsequent even address.

'Output data area (for mode 3)' (Un\G14336 to Un\G18431) cannot be assigned to the following DP-Slaves. The addresses for them are assigned to the DP-Slaves subsequent to them instead.

• DP-Slaves without an output data length assigned

• DP-Slaves with an output data length of 0 byte assigned

Address information area (for mode 3)

■Address information area (for mode 3) (Un\G22528 to Un\G22777)

This area stores the FDL address and I/O data length of DP-Slaves when operation mode is communication mode (mode 3).
Address information area (for mode 3) stores information on 125 stations in the same sorting order of data.
Information on reserved stations or temporarily reserved stations is stored as well.

Address	Bit	Name	Description	Initial value
Un\G22528	—	FDL address (1st station)	Stores the 1st FDL address. • 0000H to 007DH (0 to 125): FDL address • FFFFH: FDL address is not assigned	FFFFH
Un\G22529	b0 to b7	I/O data length (1st station)	Stores the output data length for the 1st station. • 00H to F4H: Output data length (Unit: byte)*1 • FFH: Output data length is not assigned*1	FFH
	b8 to b15		Stores the input data length for the 1st station. • 00H to F4H: Input data length (Unit: byte)*1 • FFH: input data length is not assigned*1	FFH
Un\G22530	—	FDL address (2nd station)	Stores the 2nd FDL address. • 0000H to 007DH (0 to 125): FDL address • FFFFH: FDL address is not assigned	FFFFH
Un\G22531	b0 to b7	I/O data length (2nd station)	Stores the output data length for the 2nd station. • 00H to F4H: Output data length (Unit: byte)*1 • FFH: Output data length is not assigned*1	FFH
	b8 to b15		Stores the input data length for the 2nd station. • 00H to F4H: Input data length (Unit: byte)*1 • FFH: input data length is not assigned*1	FFH
⋮				
Un\G22776	—	FDL address (125th station)	Stores the 125th FDL address. • 0000H to 007DH (0 to 125): FDL address • FFFFH: FDL address is not assigned	FFFFH
Un\G22777	b0 to b7	I/O data length (125th station)	Stores the output data length for the 125th station. • 00H to F4H: Output data length (Unit: byte)*1 • FFH: Output data length is not assigned*1	FFH
	b8 to b15		Stores the input data length for the 125th station. • 00H to F4H: Input data length (Unit: byte)*1 • FFH: input data length is not assigned*1	FFH

*1 The difference between 00H and FFH is as follows.
00H indicates that input data length or output data length is assigned but that the length is set to 0.
FFH indicates that no input data length or output data length is assigned.

Input data start address area (for mode 3)

■Input data start address area (for mode 3) (Un\G22784 to Un\G22908)

This area stores the start address (buffer memory address) for input data from DP-Slaves when operation mode is communication mode (mode 3).

Writing a program with 'Input data start address area (for mode 3)' (Un\G22784 to Un\G22908) allows specifying addresses in input data area regardless of the number of input points of DP-Slaves.

Input data start address area (for mode 3) stores information on 125 stations in the same sorting order of data.

Address	Bit	Name	Description	Initial value
Un\G22784	—	Input data start address (1st station)	Stores the input data start address (buffer memory address) for the 1st station. • 1800H to 27FFH: Input data start address • FFFFH: Input data address is not assigned	0000H
Un\G22785	—	Input data start address (2nd station)	Stores the input data start address (buffer memory address) for the 2nd station. • 1800H to 27FFH: Input data start address • FFFFH: Input data address is not assigned	0000H
⋮				
Un\G22908	—	Input data start address (125th station)	Stores the input data start address (buffer memory address) for the 125th station. • 1800H to 27FFH: Input data start address • FFFFH: Input data address is not assigned	0000H

Output data start address area (for mode 3)

■Output data start address area (for mode 3) (Un\G22912 to Un\G23036)

This area stores the start address (buffer memory address) for output data to DP-Slaves when operation mode is communication mode (mode 3).

Writing a program with 'Output data start address area (for mode 3)' (Un\G22912 to Un\G23036) allows specifying addresses in output data area regardless of the number of output points of DP-Slaves.

Output data start address area (for mode 3) stores information on 125 stations in the same sorting order of data.

Address	Bit	Name	Description	Initial value
Un\G22912	—	Output data start address (1st station)	Stores the output data start address (buffer memory address) for the 1st station. • 3800H to 47FFH: Output data start address • FFFFH: Output data is not assigned	0000H
Un\G22913	—	Output data start address (2nd station)	Stores the output data start address (buffer memory address) for the 2nd station. • 3800H to 47FFH: Output data start address • FFFFH: Output data is not assigned	0000H
⋮				
Un\G23036	—	Output data start address (125th station)	Stores the output data start address (buffer memory address) for the 125th station. • 3800H to 47FFH: Output data start address • FFFFH: Output data is not assigned	0000H

Slave status

■Slave status area (Normal communication detection) (Un\G23040 to Un\G23047)

This area stores the communication status of DP-Slaves.

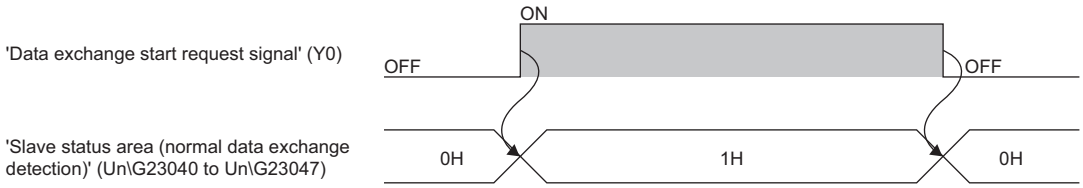
Turning off 'Data exchange start request signal' (Y0) causes all the information in 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) to be cleared.

- 0: I/O data exchange error has occurred or no data have been exchanged (including reserved stations, temporarily reserved stations, and not-configured stations)
- 1: I/O data exchanging

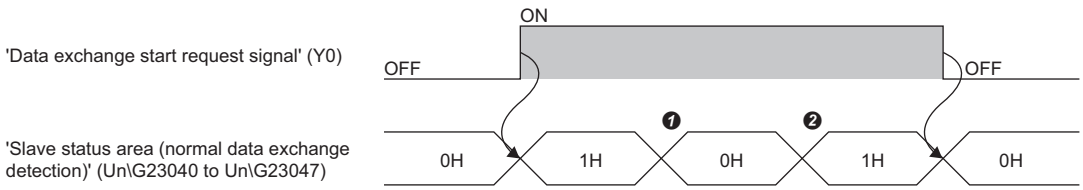
The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23040	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23041	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23042	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23043	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23044	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23045	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23046	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23047	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

Turning on 'Data exchange start request signal' (Y0) updates information in 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) and turns on bits for the DP-Slaves that are exchanging I/O data.



Occurrence of I/O data exchange error at a DP-Slave turns off the relevant bit, which is turned on again after the recovery.



❶ I/O data exchange error occurs
❷ I/O data exchange error is recovered

Point

Bits in Slave status area are assigned in the order of parameters configured with PROFIBUS Configuration Tool (order of FDL address).

Modifying the parameters with PROFIBUS Configuration Tool (adding or deleting a DP-Slave) causes the buffer memory areas to be reassigned. Review the program after modifying the parameters.

A

■Slave status area (Reserved station setting) (Un\G23048 to Un\G23055)

This area stores reserved station settings or temporarily reserved station settings for DP-Slaves. (☞ Page 44 Temporarily Reserved Station Specification Function)

- 0: Normal DP-Slave or not-configured station
- 1: Reserved station setting or temporarily reserved station setting

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23048	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23049	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23050	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23051	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23052	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23053	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23054	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23055	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

■Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064)

This area stores diagnostic information generation status of DP-Slaves. (☞ Page 24 Acquisition of diagnostic information and extended diagnostic information)

Turning on 'Data exchange start request signal' (Y0) clears all the information in 'Slave status area (Diagnostic information detection)' (Un\G23056 to Un\G23064).

Address	Name	Description	Initial value
Un\G23056	All stations' diagnostic status	Stores the diagnostic information detection status of all the DP-Slaves. When a diagnostic information has detected even on one DP-Slave in 'Each station's diagnostic status' (Un\G23057 to Un\G23064), 1 is stored in 'All stations' diagnostic status' (Un\G23056). • 0: All DP-Slaves are operating normally • 1: Diagnostic error information detected	0000H
Un\G23057 to Un\G23064	Each station's diagnostic status	Stores the diagnostic information detection status of each DP-Slave. • 0: Normal (including reserved stations, temporarily reserved stations, and not-configured stations) • 1: Diagnostic error information has been detected	0000H

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23057	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23058	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23059	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23060	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23061	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23062	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23063	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23064	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

Local FDL address error information

■Local station error information area (Un\G23071)

This area stores the error information on local FDL address.

Address	Stored value	Description
Un\G23071	0000H	Normal
	Other than 0000H	Error (☞ Page 181 List of Error Codes)

Point

The information in 'Local station error information area' (Un\G23071) is not cleared by resolving the problem that occurred to the RJ71PB91V.
To clear the information in 'Local station error information area' (Un\G23071), turn on 'Diagnostic information area clear request signal' (Y2).

A

Diagnostic information

■Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)

This area stores diagnostic information on DP-Slaves generated during data exchange. (☞ Page 24 Acquisition of diagnostic information and extended diagnostic information)

Diagnostic information area (for mode 3) stores information on 125 stations in the same sorting order of data.

Address	Bit	Name	Description	Initial value
Un\G23072	b8 to b15	Diagnostic information area (1st station)	Stores the status 3 information on the 1st station (whether any piece of diagnostic information other than the one sent this time is stored in the DP-Slave). • 00H: No other diagnostic information is stored. • 80H: Other diagnostic information is stored.	00H
	b0 to b7		Stores the 1st FDL address. • 00H to 7DH (0 to 125): FDL address	00H
Un\G23073	b8 to b15		Stores the status 1 information on the 1st station. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
	b0 to b7		Stores the status 2 information on the 1st station. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
Un\G23074	b8 to b15	Diagnostic information area (2nd station)	Stores the status 3 information on the 2nd station (whether any piece of diagnostic information other than the one sent this time is stored in the DP-Slave). • 00H: No other diagnostic information is stored. • 80H: Other diagnostic information is stored.	00H
	b0 to b7		Stores the 2nd FDL address. • 00H to 7DH (0 to 125): FDL address	00H
Un\G23075	b8 to b15		Stores the status 2 information on the 1st station. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
	b0 to b7		Stores the status 2 information on the 2nd station. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
⋮				
Un\G23320	b8 to b15	Diagnostic information area (125th station)	Stores the status 3 information on the 125th station (whether any piece of diagnostic information other than the one sent this time is stored in the DP-Slave). • 00H: No other diagnostic information is stored. • 80H: Other diagnostic information is stored.	00H
	b0 to b7		Stores the 125th FDL address. • 00H to 7DH (0 to 125): FDL address	00H
Un\G23321	b8 to b15		Stores the status 125 information on the 1st station. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
	b0 to b7		Stores the status 125 information on the 2nd station. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H

Point

- 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) is assigned in the order of parameters configured with PROFIBUS Configuration Tool (order of FDL address).
- Modifying the parameters with PROFIBUS Configuration Tool (adding or deleting a DP-Slave) causes the buffer memory areas to be reassigned. Review the program after modifying the parameters.
- The information in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321) is not cleared by resolving the problem that occurred to the relevant DP-Slaves. To clear the information in 'Diagnostic information area (for mode 3)' (Un\G23072 to Un\G23321), turn on 'Diagnostic information area clear request signal' (Y2).

■Status 1 and status 2 information

The status 1 and status 2 information is stored diagnostic information generated in a DP-Slave and relevant bits turned on.

The following table shows the description of each bit, actions to take, and stations to detect diagnostic information.

Item	Bit	Description	Action	Detected in
Status 1	b8	I/O data exchanges with a DP-Slave failed.	Check the status of the DP-Slave and PROFIBUS line. Check the relevant parameters.	DP-Master
	b9	A DP-Slave is not ready for I/O data exchanges.	■When I/O data exchanges start The station is in normal operation. (This bit turns on every time when I/O data exchanges start.) ■When I/O data are being exchanged. Check the status of the DP-Slave and PROFIBUS line.	DP-Slave
	b10	The I/O bytes parameter received from the DP-Master does not match that of a DP-Slave.	Check the relevant parameters of the DP-Slave.	DP-Slave
	b11	Extended diagnostic information exists.	Check the status of the DP-Slave.	DP-Master
	b12	The function requested by the DP-Master is not supported.	Check that the DP-Slave supports the global control function. Check the specifications of the DP-Slave.	DP-Slave
	b13	An invalid response from a DP-Slave.	Check the status of the DP-Slave or that of the network.	DP-Master
	b14	An invalid parameter from the DP-Master.	Check the relevant parameters.	DP-Slave
	b15	The station is controlled by another DP-Master.	Check that multiple DP-Masters are not communicating with the same DP-Slave. Check the relevant parameters.	DP-Master
Status 2	b0	Parameter send request from DP-Slaves	■When I/O data exchanges start The station is in normal operation. (This bit turns on every time when I/O data exchanges start.) ■When I/O data are being exchanged. Check the status of the DP-Slave and PROFIBUS line.	DP-Slave
	b1	A malfunction occurred in the DP-Slave.	Check the status of the DP-Slave.	DP-Slave
	b2	0 (fixed)	—	—
	b3	A DP-Slave is monitoring the communication watchdog timer.	The station is in normal operation.	DP-Slave
	b4	0 (fixed)	—	—
	b5	0 (fixed)	—	—
	b6	0 (Reserved)	—	—
	b7	A parameter setting excluded the station from I/O data exchanges.	■When I/O data exchanges stop The station is in normal operation. (This bit turns on every time when I/O data exchanges stop.) ■When I/O data are being exchanged Check that a Class 2 DP-Master on the network has not changed any relevant parameter.	DP-Master

Extended diagnostic information

■Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)

This area stores the latest extended diagnostic information generated during data exchange. (☞ Page 24 Acquisition of diagnostic information and extended diagnostic information)

Address	Bit	Name	Description	Initial value
Un\G23328	—	FDL address of DP-Slave	Stores the FDL address of the DP-Slave that sent the latest extended diagnostic information stored in addresses Un\G23329 to Un\G23454. • 0000H to 007DH (0 to 125): FDL address	0000H
Un\G23329	—	Size	Stores the data size of the latest extended diagnostic information stored in addresses Un\G23330 to Un\G23454. • 0006H to 00F4H: Data size of extended diagnostic information (Unit: byte)	0000H
Un\G23330	b8 to b15	Status 1 + status 2	Stores the latest status 1 information. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
	b0 to b7		Stores the latest status 2 information. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
Un\G23331	b8 to b15	Status 3 + FDL address of DP-Master	Stores the latest status 3 information (whether any piece of extended diagnostic information other than the one sent this time is stored in the DP-Slave). • 00H: No other extended diagnostic information is stored. • 80H: Other extended diagnostic information is stored.	00H
	b0 to b7		Stores the latest FDL address of DP-Master. • 00H to 7DH (0 to 125): FDL address	00H
Un\G23332	—	Ident No.	Stores the latest Ident No. for the DP-Slave.	0000H
Un\G23333 to Un\G23454	—	Extended diagnostic information	Stores the latest extended diagnostic information (244 bytes maximum).	0000H

Point

- The information in 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454) is not cleared by resolving the problem that occurred to the relevant DP-Slaves. To clear the information in 'Extended diagnostic information area (for mode 3)' (Un\G23328 to Un\G23454), turn on 'Diagnostic information area clear request signal' (Y2).
- If b11 of 'Diagnostic information invalid setting area' (Un\G2080) is turned on, no information is stored in 'Extended diagnostic information area (mode 3)' (Un\G23328 to Un\G23454).

Acquisition of extended diagnostic information

■Extended diagnostic information read request area (Un\G23456)

This area stores the FDL address of a DP-Slave from which extended diagnostic information is read.

Address	Setting value	Description
Un\G23456	0000H to 007DH (FDL address: 0 to 125)	Stores the FDL address for a DP-Slave.

Setting an FDL address in 'Extended diagnostic information read request area' (Un\G23456) and turning on 'Extended diagnostic information read request signal' (Y6) causes extended diagnostic information to be stored in 'Extended diagnostic information read response area' (Un\G23457 to Un\G23583).

■Extended diagnostic information read response area (Un\G23457 to Un\G23583)

This area stores the result of the extended diagnostic information read request.

Completion of operation with an error causes addresses Un\G23458 to Un\G23583 to be set to 0H.

Address	Bit	Name	Description	Initial value
Un\G23457	—	Read results code	Stores the read result • A200H: Completed successfully • Other than A200H: Completed with an error (☞ Page 181 List of Error Codes)	0000H
Un\G23458	—	Size	Stores the data size of the extended diagnostic information stored in addresses Un\G23459 to Un\G23583. • 0006H to 00F4H: Data size of extended diagnostic information (Unit: byte)	0000H
Un\G23459	b8 to b15	Status 1 + status 2	Stores the status 1 information. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
	b0 to b7		Stores the status 2 information. • 00H: Normal • Other than 00H: ☞ Page 233 Status 1 and status 2 information	00H
Un\G23460	b8 to b15	Status 3 + FDL address of DP-Master	Stores the status 3 information (whether any piece of extended diagnostic information other than the one sent this time is stored in the DP-Slaves). • 00H: No other extended diagnostic information is stored. • 80H: Other extended diagnostic information is stored.	00H
	b0 to b7		Stores the FDL address of the DP-Master. Stores FFH for a DP-Slave that have not started I/O data exchanges. • 00H to 7DH (0 to 125): FDL address	00H
Un\G23461	—	Ident No.	Stores the Ident No. for the DP-Slaves.	0000H
Un\G23462 to Un\G23583	—	Extended diagnostic information	Stores the extended diagnostic information (244 bytes maximum).	0000H

Setting status for DP-Slaves

■Parameter setting status area (Active station) (Un\G23584 to Un\G23591)

This area indicates the DP-Slave set as normal DP-Slaves by slave parameters.

Setting status is stored when 'Communication READY signal' (X1B) turns on.

- 0: Reserved station setting or not-configured station setting
- 1: Normal DP-Slave

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23584	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23585	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23586	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23587	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23588	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23589	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23590	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23591	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

■Parameter setting status area (Reserved station) (Un\G23592 to Un\G23599)

This area indicates the DP-Slaves set as reserved stations by slave parameters.

Setting status is stored when 'Communication READY signal' (X1B) turns on.

- 0: Normal DP-Slave or not-configured station
- 1: Reserved station setting

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23592	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23593	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23594	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23595	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23596	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23597	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23598	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23599	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

Temporarily reserved station specification function

■Temporarily reserved station specification status area (Un\G23600 to Un\G23607)

This area indicates the DP-Slaves set as temporarily reserved stations by the temporarily reserved station specification function. (☞ Page 44 Temporarily Reserved Station Specification Function)

Setting status is stored when 'Data exchange start completed signal' (X0) turns on.

- 0: Normal DP-Slave, reserved station setting, or not-configured station
- 1: Temporarily reserved station setting

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23600	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23601	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23602	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23603	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23604	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23605	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23606	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23607	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

A

■Temporarily reserved station specification request area (Un\G23608 to Un\G23615)

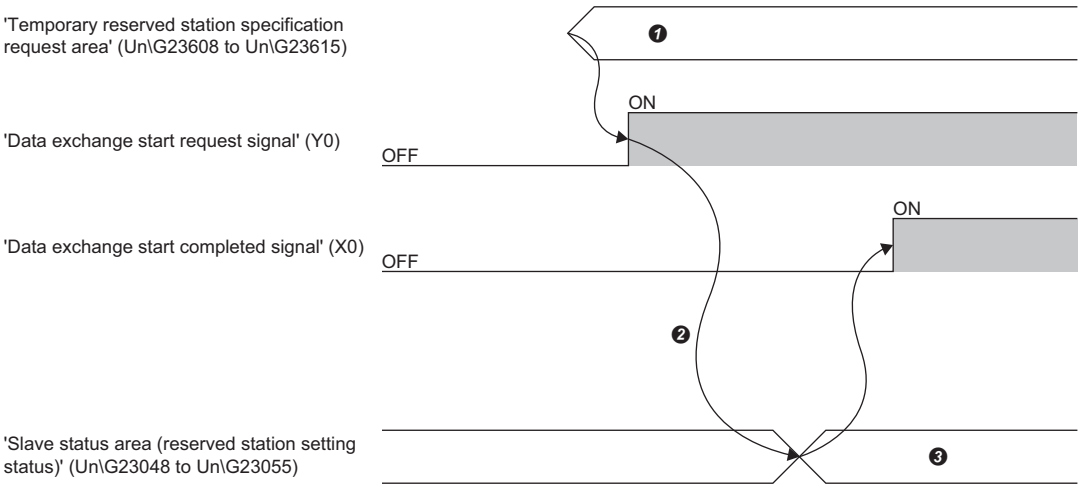
This area sets which DP-Slaves are to be specified as temporarily reserved stations by the temporarily reserved station specification function.

- 0: Not specify the DP-Slave as a temporarily reserved station
- 1: Specify the DP-Slave as a temporarily reserved station

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23608	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23609	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23610	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23611	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23612	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23613	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23614	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23615	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

Turning on 'Data exchange start request signal' (Y0) causes DP-Slaves specified in 'Temporarily reserved station specification request area' (Un\G23608 to Un\G23615) to be specified as temporarily reserved stations.



❶ Specify temporarily reserved stations
❷ The temporarily reserved station specification function is executed
❸ Stores the logical sum of 'Parameter setting status area (reserved station)' (Un\G23592 to Un\G23599) and 'Temporarily reserved station specification status area' (Un\G23600 to Un\G23607)

Point

- Configure the values of 'Temporarily reserved station specification request area' (Un\G23608 to Un\G23615) when 'Data exchange start request signal' (Y0) is off. Any value configured while 'Data exchange start request signal' (Y0) is on will be ignored.
- Normal DP-Slaves can be switched into temporarily reserved stations. Reserved stations (DP-Slaves set as reserved stations by slave parameters) cannot be switched into normal DP-Slaves.

System switching condition setting

This area sets system switching execute which errors for DP-Slaves in the redundant system.

■System switching condition setting (Un\G23648)

Set OR condition or AND condition for 'System switching DP-Slaves specification' (Un\G23649 to Un\G23656).

- 0H: OR condition is set. One or more DP-Slaves for which corresponding bits are turned on have an error, system switching is executed.
- 1H: AND condition is set. All DP-Slaves for which corresponding bits are turned on have an error, system switching is executed.

■System switching DP-Slave specification (Un\G23649 to Un\G23656)

Bits corresponding to DP-Slaves for system switching are turned on.

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23649	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23650	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23651	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23652	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23653	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23654	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23655	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23656	Fixed to 0				124	123	122	121	120	119	118	117	116	115	114	113

Point

When system switching due to DP-Slave errors is executed, all DP-Slaves for system switching must have a normal communication in the new control system once to execute system switching again.

- This requirement applies regardless of whether OR or AND condition is set for 'System switching condition setting' (Un\G23648).
- DP-Slaves that are not specified for system switching are not affected even if an error occurs.

Ex.

When 'System switching condition setting' (Un\G23648) is set to OH

Example	Specification of Un\G23649 of the system switching DP-Slave specification			System switching
	b2 (3rd DP-Slave): On	b1 (2nd DP-Slave): Off	b0 (1st DP-Slave): On	
No.1	Error occurs	—	—	Execute
No.2	—	Error occurs	—	Not execute (b1 is off and is not applicable.)
No.3	—	—	Error occurs	Execute
No.4	Error occurs	—	Error occurs	Execute

Ex.

When 'System switching condition setting' (Un\G23648) is set to 1H

Example	Specification of Un\G23649 of the system switching DP-Slave specification			System switching
	b2 (3rd DP-Slave): On	b1 (2nd DP-Slave): Off	b0 (1st DP-Slave): On	
No.1	Error occurs	—	—	Not execute
No.2	—	Error occurs	—	Not execute
No.3	—	—	Error occurs	Not execute
No.4	Error occurs	—	Error occurs	Execute (b1 is off and is not applicable.)

System switching condition setting

This area stores results set in 'System switching condition setting' (Un\G23648) and 'System switching DP-Slave specification' (Un\G23649 to Un\G23656) when 'Data exchange start request signal' (Y0) is on.

■System switching condition setting results (Un\G23664)

A value set in 'System switching condition setting' (Un\G23648) is stored.

- 0H: OR condition
- 1H: AND condition

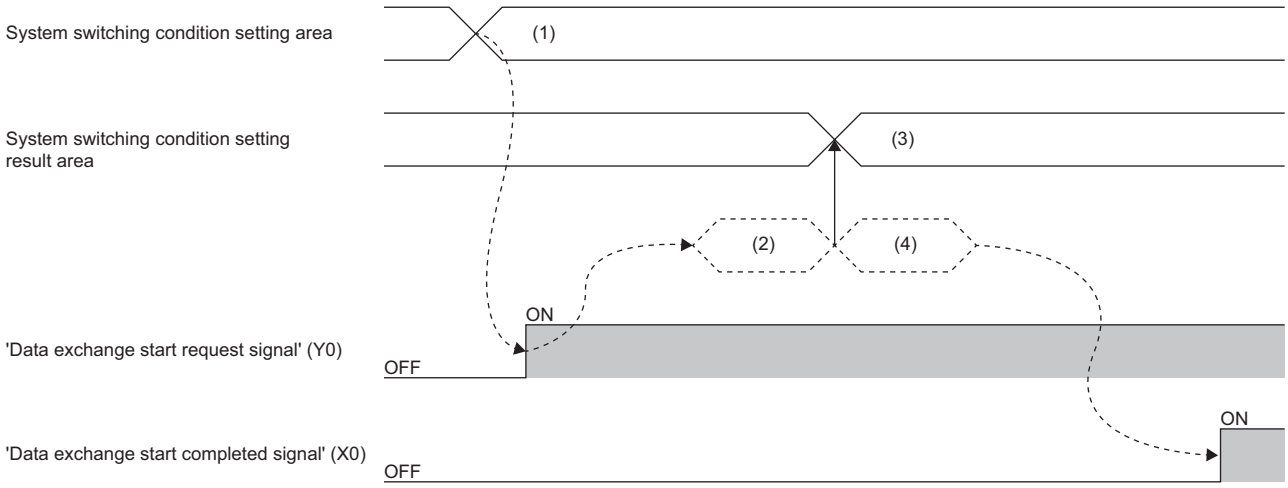
When a value other than 0H or 1H is set, the value is stored in 'System switching condition setting results' (Un\G23664), but 0 is stored in 'System switching DP-Slave specification results' (Un\G23665 to Un\G23672).

■System switching DP-Slave specification results (Un\G23665 to Un\G23672)

A value (bit) set in 'System switching DP-Slave specification' (Un\G23649 to Un\G23656) is stored.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G23665	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G23666	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G23667	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G23668	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G23669	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G23670	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G23671	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G23672	Fixed to 0				124	123	122	121	120	119	118	117	116	115	114	113

The system switching condition setting operates when 'Data exchange start request signal' (Y0) is turned on. Set request data before 'Data exchange start request signal' (Y0) is turned on.



(1) Request data
(2) System switching condition setting
(3) Start communications.
(4) Store results.

Execution instructions of acyclic communication function

■Acyclic communication request execution instruction area (Un\G23808)

This area sets the acyclic communication execution function instructions. (☞ Page 31 Acyclic Communication Function)

Turning on a bit causes the relevant request instruction to be executed.

- 0: Do not execute the instruction.
- 1: Execute the instruction.

Address	Bit	Description	Initial value
Un\G23808	b0	Execution instruction for request instruction No.1.	0
	b1	Execution instruction for request instruction No.2.	0
	b2	Execution instruction for request instruction No.3.	0
	b3	Execution instruction for request instruction No.4.	0
	b4	Execution instruction for request instruction No.5.	0
	b5	Execution instruction for request instruction No.6.	0
	b6	Execution instruction for request instruction No.7.	0
	b7	Execution instruction for request instruction No.8.	0
	b8 to b15	—	0H (fixed)

Precautions

The acyclic communication function cannot execute with the global control function or time control over DP-Slaves. When used in conjunction with these functions, configure an interlock circuit in the program.

Request instructions of acyclic communication function

■Acyclic communication request area (Un\G23809 to Un\G24832)

This area specifies the acyclic communication function request instructions.

A maximum of the eight request instructions can be specified.

Address	Name	Data size
Un\G23809 to Un\G23936	Request instruction No.1 area	128 word
Un\G23937 to Un\G24064	Request instruction No.2 area	128 word
Un\G24065 to Un\G24192	Request instruction No.3 area	128 word
Un\G24193 to Un\G24320	Request instruction No.4 area	128 word
Un\G24321 to Un\G24448	Request instruction No.5 area	128 word
Un\G24449 to Un\G24576	Request instruction No.6 area	128 word
Un\G24577 to Un\G24704	Request instruction No.7 area	128 word
Un\G24705 to Un\G24832	Request instruction No.8 area	128 word

■Request format for READ (Class1/Class2) service

Address	Bit	Name		Description	Setting value
Un\G23809	—	Request instruction No.1 area	READ request code	Sets the code for reading data from the DP-Slave.	• READ (Class1): 1400H • READ (Class2): 1410H
Un\G23810	b8 to b15		CommRef number	• READ (Class1): 0H • READ (Class2): Set CommRef number which is acquired by INITIATE (Class2) service.	
	b0 to b7		FDL address	Stores the FDL address of the DP-Slave from which data is read.	0 to 125
Un\G23811	—		Data length	Sets the data length of the read data. (Unit: Bytes)	1 to 240
Un\G23812	—		Slot number	Sets the slot number from which data is read.	0 to 254
Un\G23813	—		Index	Sets the index from which data is read.	0 to 255
Un\G23814 to Un\G23936	—		Empty (fixed to 0)		
Un\G23937 to Un\G24064	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G24705 to Un\G24832	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Request format for WRITE (Class1/Class2) service

Address	Bit	Name		Description	Setting value
Un\G23809	—	Request instruction No.1 area	WRITE request code	Sets the code that writes data to the DP-Slave.	• WRITE (Class1): 1401H • WRITE (Class2): 1411H
Un\G23810	b8 to b15		CommRef number	• WRITE (Class1): 0H • WRITE (Class2): Set CommRef number which is acquired by INITIATE (Class2) service.	
	b0 to b7		FDL address	Sets the FDL address of the DP-Slave to which data is written.	0 to 125
Un\G23811	—		Data length	Sets the data length of the write data. (Unit: Bytes)	1 to 240
Un\G23812	—		Slot number	Sets the slot number to which data is written.	0 to 254
Un\G23813	—		Index	Sets the index to which data is written.	0 to 255
Un\G23814 to Un\G23933	—		Data	Sets the data to be written.	
Un\G23934 to Un\G23936	—		Empty (fixed to 0)		
Un\G23937 to Un\G24064	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G24705 to Un\G24832	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Request format for INITIATE (Class2) service

Address	Bit	Name		Description	Setting value
Un\G23809	—	Request instruction No.1 area	INITIATE request code	Sets the code that connects the line to the DP-Slave.	1412H
Un\G23810	b8 to b15		Empty (fixed to 0)		
	b0 to b7		FDL address	Sets the FDL address of a DP-Slave that connects to the line.	0 to 125
Un\G23811	—		Transmission timeout	Sets the timeout value for sending acyclic communication. The setting range differs depending on DP-Slaves. (📖 Manual for the DP-Slave)	0 to 65535
Un\G23812	b8 to b15		Empty (fixed to 0)		
	b0 to b7		Alignment	Sets the value that indicates the specifications supported by the DP-Slave.	The setting range differs depending on DP-Slaves. (📖 Manual for the DP-Slave)
Un\G23813	—		Features Supported		
Un\G23814	—		Profile Features Supported		
Un\G23815	—		Profile Ident Number		
Un\G23816	b8 to b15		S_Len	Sets the S_Addr length.	
	b0 to b7		S_Type	Sets the value that indicates the specifications supported by the DP-Slave.	
Un\G23817	b8 to b15		D_Len	Sets the D_Addr length.	
	b0 to b7		D_Type	Sets the value that indicates the specifications supported by the DP-Slave.	
Un\G23818 to Un\G23936	—		Empty (fixed to 0)		
Un\G23937 to Un\G24064	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G24705 to Un\G24832	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Request format for ABORT (Class2) service

Address	Bit	Name		Description	Setting value
Un\G23809	—	Request instruction No.1 area	ABORT request code	Sets the code that disconnects the line from the DP-Slave.	1413H
Un\G23810	b8 to b15		CommRef number	Sets CommRef number which is acquired by INITIATE (Class2) service.	
	b0 to b7		FDL address	Sets the FDL address of a DP-Slave that disconnects from the line.	0 to 125
Un\G23811	b8 to b15		Instance Reason	Sets the value that indicates the specifications supported by the DP-Slave.	30H (fixed)
	b0 to b7		Subnet		00H (fixed)
Un\G23812 to Un\G23936	—		Empty (fixed to 0)		
Un\G23937 to Un\G24064	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G24705 to Un\G24832	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

A

Status of acyclic communication function

■Acyclic communication request result area (Un\G25120)

This area stores the reception status and the completed status of the acyclic communication.

Address	Bit	Name	Description	Initial value
Un\G25120	b0	Completed status bit • 0: The request has been unexecuted or is being executed • 1: Execution is completed	Completed status of request instruction No.1.	0
	b1		Completed status of request instruction No.2.	0
	b2		Completed status of request instruction No.3.	0
	b3		Completed status of request instruction No.4.	0
	b4		Completed status of request instruction No.5.	0
	b5		Completed status of request instruction No.6.	0
	b6		Completed status of request instruction No.7.	0
	b7		Completed status of request instruction No.8.	0
	b8	Reception status bit • 0: The request has not been accepted • 1: The request has been accepted	Acceptance status of request instruction No.1.	0
	b9		Acceptance status of request instruction No.2.	0
	b10		Acceptance status of request instruction No.3.	0
	b11		Acceptance status of request instruction No.4.	0
	b12		Acceptance status of request instruction No.5.	0
	b13		Acceptance status of request instruction No.6.	0
	b14		Acceptance status of request instruction No.7.	0
	b15		Acceptance status of request instruction No.8.	0

Turning off 'Data exchange start request signal' (Y0) causes all the information in 'Slave status area (Normal communication detection)' (Un\G23040 to Un\G23047) to be cleared.

Execution result of acyclic communication function

■Acyclic communication response area (Un\G25121 to Un\G26144)

This area stores the result of the acyclic communication.

Address	Name	Data size
Un\G25121 to Un\G25248	Request instruction No.1 area	128 word
Un\G25249 to Un\G25376	Request instruction No.2 area	128 word
Un\G25377 to Un\G25504	Request instruction No.3 area	128 word
Un\G25505 to Un\G25632	Request instruction No.4 area	128 word
Un\G25633 to Un\G25760	Request instruction No.5 area	128 word
Un\G25761 to Un\G25888	Request instruction No.6 area	128 word
Un\G25889 to Un\G26016	Request instruction No.7 area	128 word
Un\G26017 to Un\G26144	Request instruction No.8 area	128 word

■Normal response format for READ (Class1/Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	READ Normal response code	Stores the response code that occurs when data read from the DP-Slave is completed successfully.	• READ (Class1): A400H • READ (Class2): A410H
Un\G25122	b8 to b15		CommRef number	• READ (Class1): 0H • READ (Class2): Store CommRef number which is acquired by INITIATE (Class2) service.	
	b0 to b7		FDL address	Stores the FDL address of the read DP-Slave.	0 to 125
Un\G25123	—		Data length	Stores the read data length. (Unit: Bytes)	1 to 240
Un\G25124	—		Slot number	Stores the read slot number.	0 to 254
Un\G25125	—		Index	Stores the read index.	0 to 255
Un\G25126 to Un\G25245	—		Data	Stores the read data. • If the index set in the READ request is shorter than the data length, only the read data is stored. • If the index set in the READ request is longer than the data length, only the set data length is stored.	
Un\G25246 to Un\G25248	—		Empty (fixed to 0)		
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Abnormal response format for READ (Class1/Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	READ Abnormal response code	Stores the response code that occurs when an error occurs in reading data from the DP-Slave.	☞ Page 185 List of Status Codes
Un\G25122	b8 to b15		CommRef number	• READ (Class1): 0H • READ (Class2): Store CommRef number which is acquired by INITIATE (Class2) service.	
	b0 to b7		FDL address	Stores the FDL address of the read DP-Slave.	0 to 125
Un\G25123	—		Detailed status code 1	• Other than FFFFH: ☞ Page 185 List of Status Codes • FFFFH: Detailed status code 1 does not exist.	
Un\G25124	—		Detailed status code 2	• Other than FFFFH: ☞ Page 185 List of Status Codes(Refer to the DP-Slave manual if the status code is not in the list) • FFFFH: Detailed status code 2 does not exist.	
Un\G25125	—		Detailed status code 3	Refer to the manual of the DP-Slave.	
Un\G25126 to Un\G25248	—		Empty (fixed to 0)		
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

A

■Normal response format for WRITE (Class1/Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	WRITE Normal response code	Stores the response code that occurs when data written to the DP-Slave is completed successfully.	• WRITE (Class1): A401 • WRITE (Class2): A411
Un\G25122	b8 to b15		CommRef number	• WRITE (Class1): 0H • WRITE (Class2): Set CommRef number which is acquired by INITIATE (Class2) service.	
	b0 to b7		FDL address	Stores the FDL address of the written DP-Slave.	0 to 125
Un\G25123	—		Data length	Stores the written data length. (Unit: Bytes)	1 to 240
Un\G25124	—		Slot number	Stores the written slot number.	0 to 254
Un\G25125	—		Index	Stores the written index.	0 to 255
Un\G25126 to Un\G25248	—		Empty (fixed to 0)		
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Abnormal response format for WRITE (Class1/Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	WRITE Abnormal response code	Stores the response code that occurs when an error occurs in writing data from the DP-Slave.	☞ Page 185 List of Status Codes
Un\G25122	b8 to b15		CommRef number	• WRITE (Class1): 0H • WRITE (Class2): Set CommRef number which is acquired by INITIATE (Class2) service.	
	b0 to b7		FDL address	Stores the FDL address of the written DP-Slave.	0 to 125
Un\G25123	—		Detailed status code 1	• Other than FFFFH: ☞ Page 185 List of Status Codes • FFFFH: Detailed status code 1 does not exist.	
Un\G25124	—		Detailed status code 2	• Other than FFFFH: ☞ Page 185 List of Status Codes(Refer to the DP-Slave manual if the status code is not in the list) • FFFFH: Detailed status code 2 does not exist.	
Un\G25125	—		Detailed status code 3	Refer to the manual of the DP-Slave.	
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Normal response format for INITIATE (Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	INITIATE Normal response code	Stores the response code that occurs when a connection is established successfully.	A412
Un\G25122	b8 to b15		CommRef number	Stores the CommRef number used by the INITIATE service.	0 to 126
	b0 to b7		FDL address	Stores the FDL address of the DP-Slave connected to the line.	0 to 125
Un\G25123	—		Max LenDataUnit	Stores the value that indicates the specifications supported by the DP-Slave.	
Un\G25124	—		Features Supported		
Un\G25125	—		Profile Features Supported		
Un\G25126	—		Profile Ident Number		
Un\G25127	b8 to b15		S_Len		
	b0 to b7		S_Type		
Un\G25128	b8 to b15		D_Len		
	b0 to b7		D_Type		
Un\G25129 to Un\G25248	—		Empty (fixed to 0)		
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Abnormal response format for INITIATE (Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	INITIATE Abnormal response code	Stores the response code that occurs when an error occurs in the line connection.	☞ Page 185 List of Status Codes
Un\G25122	b8 to b15		CommRef number	Stores the CommRef number used by the INITIATE service.	0 to 126
	b0 to b7		FDL address	Stores the FDL address of the DP-Slave connected to the line.	0 to 125
Un\G25123	—		Detailed status code 1	• Other than FFFFH: ☞ Page 185 List of Status Codes • FFFFH: Detailed status code 1 does not exist.	
Un\G25124	—		Detailed status code 2	• Other than FFFFH: ☞ Page 185 List of Status Codes(Refer to the DP-Slave manual if the status code is not in the list) • FFFFH: Detailed status code 2 does not exist.	
Un\G25125	—		Detailed status code 3	Refer to the manual of the DP-Slave.	
Un\G25126 to Un\G25248	—		Empty (fixed to 0)		
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Normal response format for ABORT (Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	ABORT Normal response code	Stores the response code that occurs when a line is disconnected successfully.	A413
Un\G25122	b8 to b15		CommRef number	Stores the CommRef number used by the ABORT service.	0 to 126
	b0 to b7		FDL address	Stores the FDL address of the DP-Slave connected to the line.	0 to 125
Un\G25123 to Un\G25248	—		Empty (fixed to 0)		
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

■Abnormal response format for ABORT (Class2) service

Address	Bit	Name		Description	Stored value
Un\G25121	—	Request instruction No.1 area	ABORT Abnormal response code	Stores the response code that occurs when an error occurs in the line disconnection.	☞ Page 185 List of Status Codes
Un\G25122	b8 to b15		CommRef number	Stores the CommRef number used by the ABORT service.	0 to 126
	b0 to b7		FDL address	Stores the FDL address of the DP-Slave connected to the line.	0 to 125
Un\G25123 to Un\G25248	—		Empty (fixed to 0)		
Un\G25249 to Un\G25376	—	Request instruction No.2 area	Same as the request instruction No.1 area.		
⋮					
Un\G26017 to Un\G26144	—	Request instruction No.8 area	Same as the request instruction No.1 area.		

Alarm acquisition function (detection)

■Slave status area (Alarm detection) (Un\G26416 to Un\G26424)

This area stores alarm occurrence status of DP-Slaves. (☞ Page 34 Alarm Acquisition Function)

Address	Name	Description	Initial value
Un\G26416	All stations' alarm status	Stores the alarm detection status of all the DP-Slaves. When an alarm has detected even on one DP-Slave in 'Each station's alarm status' (Un\G26417 to Un\G26424), 1 is stored in 'All stations' alarm status' (Un\G26416). • 0: No alarm detected • 1: Alarm detected When 1 is stored as 'All stations' alarm status' (Un\G26416), BF LED and DIA LED turn on.	0000H
Un\G26417 to Un\G26424	Each station's alarm status	The alarm detection status of each DP-Slave is stored by turning the appropriate bit on. • 0: No alarm detected (including reserved stations, temporarily reserved stations, not-configured stations, and alarm-unsupported stations) • 1: Alarm detected in	0000H

The values in the table indicate which number of DP-Slave each bit represents.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G26417	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G26418	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G26419	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G26420	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G26421	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G26422	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G26423	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G26424	Fixed to 0			125	124	123	122	121	120	119	118	117	116	115	114	113

A

Alarm acquisition function (request)

■Alarm request area (Un\G26432 to Un\G26434)

This area sets request data with the format in two methods for the alarm acquisition function. (☞ Page 34 Alarm Acquisition Function)

■Request format when the alarm is read (without ACK)

Address	Bit	Name	Description	Setting value
Un\G26432	—	Alarm read (without ACK) request code	Sets the code that acquires the alarm without returning ACK.	1500H
Un\G26433	—	FDL address	Sets the FDL address of the DP-Slave for the alarm acquisition destination.	0 to 125
Un\G26434	—	Empty (Fixed to 0H)		

■Request format for alarm ACK

Address	Bit	Name	Description	Setting value
Un\G26432	—	Alarm ACK request code	Sets the code that returns ACK to cancel the alarm in the DP-Slave that was acquired without returning ACK.	1501H
Un\G26433	—	FDL address	Sets the FDL address of the DP-Slave to the ACK return address.	0 to 125
Un\G26434	b0	Alarm No.	ACK is returned for alarm No.1.	
	b1		ACK is returned for alarm No.2.	
	b2		ACK is returned for alarm No.3.	
	b3		ACK is returned for alarm No.4.	
	b4		ACK is returned for alarm No.5.	
	b5		ACK is returned for alarm No.6.	
	b6		ACK is returned for alarm No.7.	
	b7		ACK is returned for alarm No.8.	
	b8 to b15	Empty (Fixed to 0H)		

Restriction

Alarm ACK request is not executed when the results of executing the alarm read (without ACK) request is not stored in 'Alarm response area' (Un\G26446 to Un\G26768).

■Request format when the alarm is read (with ACK)

Address	Bit	Name	Description	Setting value
Un\G26432	—	Alarm read (with ACK) request code	Sets the code that synchronizes the alarm acquisition and ACK return.	1502H
Un\G26433	—	FDL address	Sets the FDL address of the DP-Slave for the alarm acquisition destination.	0 to 125
Un\G26434	—	Empty (Fixed to 0H)		

Alarm acquisition function (response)

■Alarm response area (Un\G26446 to Un\G26768)

Stores the results of executing each of the alarm read (without ACK) request, alarm ACK request and alarm read (with ACK) request.

■Normal response format when the alarm is read (without ACK)

Address	Bit	Name		Description	Stored value
Un\G26446	—	Alarm read (without ACK) normal response code		Stores the response code that occurs when an alarm read (without ACK) request is completed successfully.	A500H
Un\G26447	—	FDL address		Stores the FDL address of the DP-Slave that acquires the alarm.	0 to 125
Un\G26448	b8 to b15	Empty (Fixed to 0H)			
	b0 to b7	Completed status		Bit of the alarm No. for which alarm acquisition completed successfully turns on.	
Un\G26449	—	Alarm No.1	Alarm data length	Stores the acquired alarm data length. (Unit: Bytes)	1 to 64
Un\G26450	—		Alarm type	Stores the acquired alarm type. • A510H: Diagnosis Alarm • A511H: Process alarm • A512H: Pull Alarm • A513H: Plug Alarm • A514H: Status Alarm • A515H: Update Alarm • A516H: Manufacturer Specific Alarm	
Un\G26451	—		Alarm slot number	Stores the slot number that has an alarm notification.	0 to 254
Un\G26452	b0, b1		Details	Status classification is stored. • 00: No additional information • 01: Error is received, a malfunction is in the slot. (An error is detected, and an alarm is notified from that slot) • 10: Error is cleared and the slot is normal. (An alarm is notified from the slot, but no subsequent error occurs) • 11: Error is cleared but a malfunction is in the slot. (An alarm is notified from the slot, and the error continues)	
	b2			ACK return requirement is stored. • 0: ACK return not required • 1: ACK return required	
	b3 to b7			Sequence number is stored.	0 to 31
	b8 to b15			Empty (Fixed to 0H)	
Un\G26453 to Un\G26484	—		Alarm data	Stores the acquired alarm data. (Maximum 64 bytes)	
Un\G26485 to Un\G26488	—		Empty This area is the response area for the Alarm ACK request.		
Un\G26489 to Un\G26528	—	Alarm No.2	Same as alarm No.1.		
⋮					
Un\G26729 to Un\G26768	—	Alarm No.8	Same as alarm No.1.		

A

■Abnormal response format when the alarm is read (without ACK)

Address	Bit	Name		Description	Stored value
Un\G26446	—	Alarm read (without ACK) abnormal response code		Stores the response code that occurs when an alarm read (without ACK) request is completed with an error.	☞ Page 185 List of Status Codes
Un\G26447	—	FDL address		Stores the FDL address of the DP-Slave that acquires the alarm.	0 to 125
Un\G26448	b8 to b15	Empty (Fixed to 0H)			
	b0 to b7	Completed status		Bit of the alarm No. for which alarm acquisition completed successfully turns on.	
Un\G26449	—	Alarm No.1	Alarm details status code 1	• Other than FFFFH: ☞ Page 185 List of Status Codes • FFFFH: Detailed status code 1 does not exist.	
Un\G26450	—		Alarm details status code 2	• Other than FFFFH: ☞ Page 185 List of Status Codes(Refer to the DP-Slave manual if the status code is not in the list) • FFFFH: Detailed status code 2 does not exist.	
Un\G26451	—		Alarm details status code 3		
Un\G26452 to Un\G26484	—		Empty (fixed to 0)		
Un\G26485 to Un\G26488	—		Empty This area is the response area for the Alarm ACK request.		
Un\G26489 to Un\G26528	—	Alarm No.2	Same as alarm No.1.		
⋮					
Un\G26729 to Un\G26768	—	Alarm No.8	Same as alarm No.1.		

■Normal response format for alarm ACK

Address	Bit	Name		Description	Stored value
Un\G26446	—	ACK Normal response code		Stores the response code that occurs when an ACK request is completed successfully.	A501H
Un\G26447	—	FDL address		Stores the FDL address of the DP-Slave for the ACK return address.	0 to 125
Un\G26448	b8 to b15	Completed status		Bit of an alarm No. for which ACK return completed successfully turns on.	
	b0 to b7			Bit of the alarm No. for which alarm acquisition completed successfully turns on.	
Un\G26449 to Un\G26484	—	Alarm No.1 (stored when the alarm read normal bit is on)	Alarm data	Stores an alarm data acquired for the alarm read normal response. (☞ Page 251 Normal response format when the alarm is read (without ACK))	
Un\G26485	—		ACK Normal response code	Stores the response code that occurs when an Alarm ACK request is completed successfully.	A501H
Un\G26486	—		ACK type	Stores the acquired alarm type. • A510H: Diagnosis Alarm • A511H: Process alarm • A512H: Pull Alarm • A513H: Plug Alarm • A514H: Status Alarm • A515H: Update Alarm • A516H: Manufacturer Specific Alarm	
Un\G26487	b0, b1		ACK details	Status classification is stored. • 00: No additional information • 01: Error is received, a malfunction is in the slot. (An error is detected, and an alarm is notified from that slot) • 10: Error is cleared and the slot is normal. (An alarm is notified from the slot, but no subsequent error occurs) • 11: Error is cleared but a malfunction is in the slot. (An alarm is notified from the slot, and the error continues)	
	b2			ACK return requirement is stored. • 0: ACK return not required • 1: ACK return required	
	b3 to b7			Sequence number is stored.	0 to 31
	b8 to b15			Empty (Fixed to 0H)	
Un\G26488	—		ACK Slot number	Stores the slot number that has an alarm notification.	0 to 254
Un\G26489 to Un\G26528	—	Alarm No.2	Same as alarm No.1.		
⋮					
Un\G26729 to Un\G26768	—	Alarm No.8	Same as alarm No.1.		

■Abnormal response format for alarm ACK

Address	Bit	Name		Description	Stored value
Un\G26446	—	ACK Abnormal response code		Stores the response code that occurs when an ACK request is completed with an error.	☞ Page 185 List of Status Codes
Un\G26447	—	FDL address		Stores the FDL address of the DP-Slave for the ACK return address.	0 to 125
Un\G26448	b8 to b15	Completed status		Bit of an alarm No. for which ACK return completed successfully turns on.	
	b0 to b7			Bit of the alarm No. for which alarm acquisition completed successfully turns on.	
Un\G26449 to Un\G26484	—	Alarm No.1 (stored when the alarm read normal bit is off)	Alarm data	Stores an alarm data acquired for the alarm read normal response. (☞ Page 251 Normal response format when the alarm is read (without ACK))	
Un\G26485	—		ACK Abnormal response code	Stores the response code that occurs when an Alarm ACK request is completed with an error.	☞ Page 185 List of Status Codes
Un\G26486	—		ACK Detailed status code 1	• Other than FFFFH: ☞ Page 185 List of Status Codes • FFFFH: Detailed status code 1 does not exist.	
Un\G26487	—		ACK Detailed status code 2	• Other than FFFFH: ☞ Page 185 List of Status Codes(Refer to the DP-Slave manual if the status code is not in the list) • FFFFH: Detailed status code 2 does not exist.	
Un\G26488	—		ACK Detailed status code 3		
Un\G26489 to Un\G26528	—	Alarm No.2	Same as alarm No.1.		
⋮					
Un\G26729 to Un\G26768	—	Alarm No.8	Same as alarm No.1.		

■Normal response format when the alarm is read (with ACK)

Address	Bit	Name		Description	Stored value
Un\G26446	—	Alarm read (with ACK) normal response code		Stores the response code that occurs when an alarm read (with ACK) request is completed successfully.	A502H
Un\G26447	—	FDL address		Stores the FDL address of the DP-Slave for the alarm acquisition and ACK return address.	0 to 125
Un\G26448	b8 to b15	Completed status		Bit of an alarm No. for which ACK return completed successfully turns on.	
	b0 to b7			Bit of the alarm No. for which alarm acquisition completed successfully turns on.	
Un\G26449	—	Alarm No.1	Alarm data length	Stores the acquired alarm data length. (Unit: Bytes)	1 to 64
Un\G26450	—		Alarm type	Stores the acquired alarm type. • A510H: Diagnosis Alarm • A511H: Process alarm • A512H: Pull Alarm • A513H: Plug Alarm • A514H: Status Alarm • A515H: Update Alarm • A516H: Manufacturer Specific Alarm	
Un\G26451	—		Alarm slot number	Stores the slot number that has an alarm notification.	0 to 254
Un\G26452	b0, b1		Alarm details	Status classification is stored. • 00: No additional information • 01: Error is received, a malfunction is in the slot. (An error is detected, and an alarm is notified from that slot) • 10: Error is cleared and the slot is normal. (An alarm is notified from the slot, but no subsequent error occurs) • 11: Error is cleared but a malfunction is in the slot. (An alarm is notified from the slot, and the error continues)	
	b2			ACK return requirement is stored. • 0: ACK return not required • 1: ACK return required	
	b3 to b7			Sequence number is stored.	0 to 31
	b8 to b15			Empty (Fixed to 0H)	
Un\G26453 to Un\G26484	—		Alarm data	Stores the acquired alarm data. (Maximum 64 bytes)	
Un\G26485	—		ACK Normal response code	Stores the response code that occurs when an Alarm ACK request is completed successfully.	A501H
Un\G26486	—		ACK type	Stores the acquired alarm type. • A510H: Diagnosis Alarm • A511H: Process alarm • A512H: Pull Alarm • A513H: Plug Alarm • A514H: Status Alarm • A515H: Update Alarm • A516H: Manufacturer Specific Alarm	
Un\G26487	b0, b1		ACK details	Status classification is stored. • 00: No additional information • 01: Error is received, a malfunction is in the slot. (An error is detected, and an alarm is notified from that slot) • 10: Error is cleared and the slot is normal. (An alarm is notified from the slot, but no subsequent error occurs) • 11: Error is cleared but a malfunction is in the slot. (An alarm is notified from the slot, and the error continues)	
	b2			ACK return requirement is stored. • 0: ACK return not required • 1: ACK return required	
	b3 to b7			Sequence number is stored.	0 to 31
	b8 to b15			Empty (Fixed to 0H)	
Un\G26488	—		ACK Slot number	Stores the slot number that has an alarm notification.	0 to 254
Un\G26489 to Un\G26528	—	Alarm No.2	Same as alarm No.1.		
⋮					
Un\G26729 to Un\G26768	—	Alarm No.8	Same as alarm No.1.		

A

■Abnormal response format when the alarm is read (with ACK)

Address	Bit	Name		Description	Stored value
Un\G26446	—	Alarm read (with ACK) abnormal response code		Stores the response code that occurs when an alarm read (with ACK) request is completed with an error.	☞ Page 185 List of Status Codes
Un\G26447	—	FDL address		Stores the FDL address of the DP-Slave that acquires the alarm.	0 to 125
Un\G26448	b8 to b15	Completed status		Bit of an alarm No. for which ACK return completed successfully turns on.	
	b0 to b7			Bit of the alarm No. for which alarm acquisition completed successfully turns on.	
Un\G26449	—	Alarm No.1	Alarm details status code 1	• Other than FFFFH: ☞ Page 185 List of Status Codes • FFFFH: Detailed status code 1 does not exist.	
Un\G26450	—		Alarm details status code 2	• Other than FFFFH: ☞ Page 185 List of Status Codes(Refer to the DP-Slave manual if the status code is not in the list) • FFFFH: Detailed status code 2 does not exist.	
Un\G26451	—		Alarm details status code 3		
Un\G26452 to Un\G26484	—		Empty (fixed to 0)		
Un\G26485	—		ACK Abnormal response code	Stores the response code that occurs when an Alarm ACK request is completed with an error.	☞ Page 185 List of Status Codes
Un\G26486	—		ACK Detailed status code 1	• Other than FFFFH: ☞ Page 185 List of Status Codes • FFFFH: Detailed status code 1 does not exist.	
Un\G26487	—		ACK Detailed status code 2	• Other than FFFFH: ☞ Page 185 List of Status Codes(Refer to the DP-Slave manual if the status code is not in the list) • FFFFH: Detailed status code 2 does not exist.	
Un\G26488	—		ACK Detailed status code 3		
Un\G26489 to Un\G26528	—	Alarm No.2	Same as alarm No.1.		
⋮					
Un\G26729 to Un\G26768	—	Alarm No.8	Same as alarm No.1.		

■Clear timing

• At alarm read (with/without ACK) request

Address	Name	When status code E504H or E507H is undetected	When status code E507H is detected
Un\G26446	Response result	Clear	Overwrites the status code
Un\G26447	FDL address	Clear	Overwrites the FDL address
Un\G26448	Completed status	Clear	Clear
Un\G26449 to Un\G26484	Alarm No.1 alarm acquisition results	Clear	Clear
Un\G26485 to Un\G26488	ACK return results to alarm No.1	Clear	Clear
Un\G26489 to Un\G26524	Alarm No.2 alarm acquisition results	Clear	Clear
Un\G26525 to Un\G26528	ACK return results to alarm No.2	Clear	Clear
⋮			
Un\G26729 to Un\G26764	Alarm No.8 alarm acquisition results	Clear	Clear
Un\G26765 to Un\G26768	ACK return results to alarm No.8	Clear	Clear

• At the time of Alarm ACK request

Address	Name	When status code E504H, E505H or E507H is undetected	When status code E505H is detected	When status code E507H is detected
Un\G26446	Response result	Clear	Overwrites the status code	Overwrites the status code
Un\G26447	FDL address	Clear	Overwrites the FDL address	Overwrites the FDL address
Un\G26448	Completed status	Clear	Clear	Clear
Un\G26449 to Un\G26484	Alarm No.1 alarm acquisition results	Not cleared	Not cleared	Not cleared
Un\G26485 to Un\G26488	ACK return results to alarm No.1	Only the ACK return results of an alarm No. that requested alarm ACK are cleared	Not cleared	Only the ACK return results of an alarm No. that requested alarm ACK are cleared
Un\G26489 to Un\G26524	Alarm No.2 alarm acquisition results	Not cleared	Not cleared	Not cleared
Un\G26525 to Un\G26528	ACK return results to alarm No.2	Only the ACK return results of an alarm No. that requested alarm ACK are cleared	Not cleared	Only the ACK return results of an alarm No. that requested alarm ACK are cleared
⋮				
Un\G26729 to Un\G26764	Alarm No.8 alarm acquisition results	Not cleared	Not cleared	Not cleared
Un\G26765 to Un\G26768	ACK return results to alarm No.8	Only the ACK return results of an alarm No. that requested alarm ACK are cleared	Not cleared	Only the ACK return results of an alarm No. that requested alarm ACK are cleared

• When status code E504H is detected

Address	Name	When status code E504H is detected
Un\G26446	Response result	Overwrites the status code
Un\G26447	FDL address	Overwrites the FDL address
Un\G26448	Completed status	Clear
Un\G26449 to Un\G26484	Alarm No.1 alarm acquisition results	Not cleared
Un\G26485 to Un\G26488	ACK return results to alarm No.1	Not cleared
Un\G26489 to Un\G26524	Alarm No.2 alarm acquisition results	Not cleared
Un\G26525 to Un\G26528	ACK return results to alarm No.2	Not cleared
⋮		
Un\G26729 to Un\G26764	Alarm No.8 alarm acquisition results	Not cleared
Un\G26765 to Un\G26768	ACK return results to alarm No.8	Not cleared

Time control over DP-Slaves (request)

■Time control setting request area (Un\G26784 to Un\G26792)

This area sets time control setting request data. (☞ Page 36 Time Control over DP-Slaves)

■Request format for time read

Address	Bit	Name	Description	Setting value
Un\G26784	—	Time read request code	Sets the code for reading the time.	1600H
Un\G26785 to Un\G26792	—	Empty (Fixed to 0H)		

■Request format for UTC write

Address	Bit	Name	Description	Setting value
Un\G26784	—	UTC write request code	Sets the code that writes UTC.	1601H
Un\G26785, Un\G26786	—	UTC seconds	Sets in UTC seconds (year + month + day + hour + minute + second).	2650752000 to 4294967295
Un\G26787, Un\G26788	—	UTC nanoseconds	Sets the UTC nanoseconds (ms to ns).	0 to 4294967295
Un\G26789	b0	Clock state	Sets the time master synchronization.	• 0: Not synchronize the time setting with the time master. • 1: Synchronize the time setting with the time master.
	b1, b2		0 fixed	
	b3, b4		Sets the time resolution (minimum unit).	• 0: 1ms • 1: 10ms • 2: 100ms • 3: 1s
	b5		0 fixed	
	b6		Sets either summer time or winter time.	• 0: Set winter time. • 1: Set summer time.
	b7		Sets the notice for summer time and winter time.	• 0: Not switch between summer time and winter time after one hour. • 1: Switch between summer time and winter time after one hour.
	b8, b9		0 fixed	
	b10 to b14		Sets the time difference.	• 0: Not add or subtract. • 1 to 31: Add or subtracts. (Unit: × 0.5 hours)
	b15		Sets the calculation method for the time difference.	• 0: Add the time difference. • 1: Subtract the time difference.
Un\G26790 to Un\G26792	—	Empty (Fixed to 0H)		

■Request format for time write

Address	Bit	Name	Description	Setting value
Un\G26784	—	Time write request code	Sets the code that writes the time.	1602H
Un\G26785	—	Year	Sets the year.	1984 to 2036
Un\G26786	—	Month	Sets the month.	1 to 12
Un\G26787	—	Day	Sets the day.	1 to 31
Un\G26788	—	Hour	Sets the hour.	0 to 23
Un\G26789	—	Minute	Sets the minutes.	0 to 59
Un\G26790	—	Second	Sets the seconds.	0 to 59
Un\G26791	—	1/1000 second	Sets the 1/1000 seconds.	0 to 999
Un\G26792	b0	Clock state	Sets the time master synchronization.	• 0: Not synchronize the time setting with the time master. • 1: Synchronize the time setting with the time master.
	b1, b2		0 fixed	
	b3, b4		Sets the time resolution (minimum unit).	• 0: 1ms • 1: 10ms • 2: 100ms • 3: 1s
	b5		0 fixed	
	b6		Sets either summer time or winter time.	• 0: Sets winter time. • 1: Set summer time.
	b7		Sets the notice for summer time and winter time.	• 0: Not switch between summer time and winter time after one hour. • 1: Switch between summer time and winter time after one hour.
	b8, b9		0 fixed	
	b10 to b14		Sets the time difference.	• 0: Not add or subtract. • 1 to 31: Add or subtracts. (Unit: × 0.5 hours)
	b15		Sets the calculation method for the time difference.	• 0: Add the time difference. • 1: Subtract the time difference.

Time control over DP-Slaves (response)

■Time control setting response area (Un\G26800 to Un\G26812)

This area stores the result of time control setting. (☞ Page 36 Time Control over DP-Slaves)

■Normal response format for time read

Address	Bit	Name	Description	Stored value
Un\G26800	—	Time read normal response code	Stores the response code that occurs when the time read is completed successfully.	A600H
Un\G26801	—	Year	The current setting for the year is stored.	1984 to 2036
Un\G26802	—	Month	The current setting for the month is stored.	1 to 12
Un\G26803	—	Day	The current setting for the day is stored.	1 to 31
Un\G26804	—	Hour	The current setting for the hour is stored.	0 to 23
Un\G26805	—	Minute	The current setting for minutes is stored.	0 to 59
Un\G26806	—	Second	The current setting for seconds is stored.	0 to 59
Un\G26807	—	1/1000 second	The current setting for 1/1000 seconds is stored.	0 to 999
Un\G26808, Un\G26809	—	UTC seconds	The current setting stores in UTC seconds (year + month + day + hour + minute + second).	2650752000 to 4294967295
Un\G26810, Un\G26811	—	UTC nanoseconds	The current setting stores in UTC nanoseconds (ms to ns).	0 to 4294967295
Un\G26812	b0	Clock state	The current setting for time master synchronization is stored.	• 0: Not synchronize the time setting with the time master. • 1: Synchronize the time setting with the time master.
	b1, b2		0 fixed	
	b3, b4		The current setting for time resolution (minimum unit) is stored.	• 0: 1ms • 1: 10ms • 2: 100ms • 3: 1s
	b5		0 fixed	
	b6		The current setting for summer time or winter time is stored.	• 0: Set winter time. • 1: Set summer time.
	b7		The current setting for the notice for summer time or winter time is stored.	• 0: Not switch between summer time and winter time after one hour. • 1: Switch between summer time and winter time after one hour.
	b8, b9		0 fixed	
	b10 to b14		The current setting for the time difference is stored.	• 0: Not add or subtract. • 1 to 31: Add or subtracts. (Unit: × 0.5 hours)
	b15		The current setting for the time difference calculation method is stored.	• 0: Add the time difference. • 1: Subtract the time difference.

■Abnormal response format for time read

Address	Bit	Name	Description	Stored value
Un\G26800	—	Time read abnormal response code	Stores the response code that occurs when an error occurs in reading the time.	☞ Page 185 List of Status Codes
Un\G26801 to Un\G26812	—	Empty (Fixed to 0H)		

■Normal response format for UTC write

Address	Bit	Name	Description	Stored value
Un\G26800	—	Time write normal response code	Stores the response code that occurs when UTC write is completed successfully.	A601H
Un\G26801 to Un\G26812	—	Empty (Fixed to 0H)		

■Abnormal response format for UTC write

Address	Bit	Name	Description	Stored value
Un\G26800	—	UTC Write abnormal response code	Stores the response code that occurs when an error occurs in writing UTC.	☞ Page 185 List of Status Codes
Un\G26801 to Un\G26812	—	Empty (Fixed to 0H)		

■Normal response format for time write

Address	Bit	Name	Description	Stored value
Un\G26800	—	Time write normal response code	Stores the response code that occurs when time write is completed successfully.	A602H
Un\G26801 to Un\G26812	—	Empty (Fixed to 0H)		

■Abnormal response format for time write

Address	Bit	Name	Description	Stored value
Un\G26800	—	Time write abnormal response code	Stores the response code that occurs when an error occurs in writing the time.	☞ Page 185 List of Status Codes
Un\G26801 to Un\G26812	—	Empty (Fixed to 0H)		

Appendix 4 Buffer Memory Addresses on DP-Slave

The RJ71PB91V(S) exchanges data with the CPU module through the buffer memory. Data in the buffer memory are reset to the defaults (initial values) when the CPU module is turned off or reset.

List of buffer memory addresses on DP-Slave

This section lists buffer memory addresses when the RJ71PB91V is used as a DP-Slave.

Address (decimal)	Address (hexadecimal)	Name	Description	Initial value	Read, write
0 to 191	0H to BFH	Output receive area	Stores output data received from the DP-Master.	0	Read
192 to 255	C0H to FFH	System area			
256 to 447	100H to 1BFH	Input send area	Sets input data sent to the DP-Master.	0	Read, write
448 to 511	1C0H to 1FFH	System area			
512	200H	Operation transmission speed	Stores the current transmission speed.	0	Read
513	201H	Operation FDL address	Stores the current local FDL address.	7EH	Read
514	202H	FDL address set in the flash ROM	Stores the local FDL address saved to the flash ROM.	FFFFH	Read
515	203H	FDL address change request	Sets the FDL address to change it using 'FDL address change request signal' (Y13).	FFFEH	Read, write
516	204H	Count of rewriting FDL address in the flash ROM	Stores how many more times the FDL address can be rewritten in the flash ROM.	60	Read
517	205H	FDL address change availability status area	Stores whether the current operation FDL address can be changed or not.	0	Read
518	206H	FDL address setting of module parameters display area	Stores the FDL address settings of module parameters.	7EH	Read
519	207H	FDL address setting method of module parameters display area	Stores the FDL address setting method of module parameters.	0	Read
520 to 2039	208H to 7F7H	System area			
2040	7F8H	Module error information	Stores the status code detected by the RJ71PB91V (DP-Slave).	0	Read
2041 to 2053	7F9H	Extended diagnostic information area	Sets the extended diagnostic information notification data sent to the DP-Master.	0	Read, write
2054	806H	Extended diagnostic information notification result	Stores the execution result of the extended diagnostic information notification sent to the DP-Master.	0	Read
2055 to 2252	807H to 8CCH	System area			
2253	8CDH	Function mode display area	Stores the station type of the RJ71PB91V.	0	Read
2254	8CEH	Current operation mode area	Stores the current operation mode.	0	Read
2255	8CFH	Operation mode change request area	Selects the operation mode to change using 'Operation mode change request' (Y11).	FFFEH	Read, write
2256	8D0H	Operation mode change result area	Stores the execution result of 'Operation mode change request' (Y11).	0	Read
2257	8D1H	Current communication watchdog timer value	Stores the current value of the communication watchdog timer.	0	Read
2258	8D2H	Offline test status area	When the self-diagnostics test or initialization of the flash ROM is being performed or when an error is detected, the corresponding code will be stored.	0	Read
2259	8D3H	Data swap function setting status	Stores the current data swap function setting.	0	Read
2260 to 2271	8D4H to 8DFH	System area			
2272 to 2283	8E0H to 8EBH	Output receive area usage status	Stores the current usage status of 'Output receive area' (Un\G0 to Un\G191).	0	Read
2284 to 2287	8ECH to 8EFH	System area			
2288 to 2299	8F0H to 8FBH	Input send area usage status	Stores the current usage status of 'Input send area' (Un\G256 to Un\G447).	0	Read
2300 to 65535	8FCH to FFFFH	System area			

Point

Do not write data to "System area". Doing so may cause malfunction of the programmable controller system.

Details of buffer memory addresses on DP-Slave

This section describes details of buffer memory addresses when the RJ71PB91V is used as a DP-Slave.

Sending/receiving I/O data

■Output receive area (Un\G0 to Un\G191)

This area stores the output data received from the DP-Master. (Maximum 122 words)

Data configuration depends on the combination of the I/O configuration information setting and the data assignment mode setting of slave parameters of the DP-Master. (☞ Page 69 Slave parameter settings on DP-Master)

■Input send area (Un\G256 to Un\G447)

This area sets the input data sent to the DP-Master.

Data configuration depends on the combination of the I/O configuration information setting and the data assignment mode setting of slave parameters of the DP-Master. (☞ Page 69 Slave parameter settings on DP-Master)

Transmission speed

■Operation transmission speed (Un\G512)

This area stores the current transmission speed. The stored value is valid while 'Data exchanging signal' (X1) is on.

The DP-Slave automatically recognizes the transmission speed set by the parameter of the DP-Master.

Transmission speed	Stored value
Transmission speed not recognized	0000H
9.6kbps	96E2H
19.2kbps	19E3H
45.45kbps	45E3H
93.75kbps	93E3H
187.5kbps	18E4H
500kbps	05E5H
1.5Mbps	15E5H
3Mbps	03E6H
6Mbps	06E6H
12Mbps	12E6H

Transmission speed not recognized means that no communication has been made with the DP-Master.

Once recognizing the transmission speed, the DP-Slave retains the value until it recognizes the transmission speed again.

The DP-Slave recognizes the transmission speed again when the DP-Master resumes communication after it stops communication and a module watchdog timer error occurs on the DP-Slave (RJ71PB91V).

FDL address

■Operation FDL address (Un\G513)

This area stores the currently operating local FDL address (0 to 125). The stored value is valid while 'Data exchanging signal' (X1) is on.

When no FDL address has been set (when the address is factory default or after the address is cleared), 126 is stored. In such a case, I/O data are not exchanged.

■FDL address set in the flash ROM (Un\G514)

This area stores the local FDL address (0 to 125) set in the flash ROM. The stored value is valid while 'Data exchanging signal' (X1) is on.

When no FDL address has been set (when the address is factory default or after the address is cleared), FFFFH is stored.

The local FDL address is set in the flash ROM in the following cases.

- The value set in 'FDL address change request area' (Un\G515) is saved to the flash ROM by an instruction from the program.
- FDL address is set by the DP-Master (Class 2).

■FDL address change request (Un\G515)

This area sets the local FDL address from the program using 'FDL address change request signal' (Y13).

Setting value	Description	Details	Example
00□□H	FDL address change (not saved to the flash ROM)	Sets the local FDL address to be changed in hexadecimal in □□.	FDL address is changed to 12 and the change is not saved to the flash ROM: 000CH
01□□H	FDL address change (saved to the flash ROM)	Sets the local FDL address to be changed in hexadecimal in □□. Unless the setting value is changed, the value is not saved to the flash ROM even when 'FDL address change request signal' (Y13) is turned on again.	FDL address is changed to 12 and the change is saved to the flash ROM: 010CH
FFFFH	FDL address clear	Clears the FDL address set in the flash ROM. Once the FDL address is cleared, the address is not set. • Value stored in 'Operation FDL address" (Un\G513): 126 • Value stored in 'FDL address set in the flash ROM' (Un\G514): FFFFH Prohibition of FDL address change set by the DP-Master (Class 2) is canceled. (☞ Page 48 FDL address changing function)	—

If a value is set out of the setting range, an error occurs. (☞ Page 181 List of Error Codes)

Because the default (FFFEH) is a value out of the setting range, turning on 'FDL address change request signal' (Y13) without setting a value will cause an error.

■Count of rewriting FDL address in the flash ROM (Un\G516)

This area stores the remaining number of times that the FDL address can be rewritten in the flash ROM during continuous operation (in which the CPU module is not reset or the system is turned off and on).

The FDL address is saved to the flash ROM in the following cases.

- The value set in 'FDL address change request area' (Un\G515) is saved to the flash ROM by an instruction from the program.
- FDL address is set by the DP-Master (Class 2).

The rewrite counter counts up or down as follows.

- Count: When 'FDL address set in the flash ROM' (Un\G514) is changed, the counter decreases by one. When the changed FDL address is the same as 'FDL address set in the flash ROM' (Un\G514), the counter does not decrease.
- Reset: The count is reset to the default (60) when the CPU module is reset or the system is turned off and on, or when the FDL address is cleared by 'FDL address change request signal' (Y13).

When the count is 0, an attempt to save the FDL address to the flash ROM will cause an error, and the FDL address will not be changed and saved to the flash ROM. (☞ Page 181 List of Error Codes)

■FDL address change availability status area (Un\G517)

This area stores whether the current operation FDL address can be changed or not by the FDL address change function. (☞ Page 48 FDL address changing function)

"Setting Method Of FDL Address" set in the engineering tool	Stored value	FDL address change availability	Method to change the FDL address change availability
"Information Saved In Module"	0000H (Default)	FDL address can be changed.	FDL address change is prohibited when the FDL address is changed by the DP-Master (Class 2) (with FDL address change prohibited).
	0001H	FDL address change is prohibited.	Prohibition of FDL address change is canceled when the FDL address is cleared by the program.
"Parameter Editor"	00FFH	FDL address change cannot be prohibited.	FDL address cannot be changed by the DP-Master (Class 2) (with FDL address change prohibited) or the FDL address cannot be cleared by the program.

■FDL address setting of module parameters display area (Un\G518)

This area stores the status of parameter setting of the FDL address. (☞ Page 66 Module parameter)

Stored value	Description
0 to 125	Setting value of the FDL address in the "Module Parameter" window.
126	FDL address is not set.
FFFFH (Default)	Parameter is not set.

■FDL address setting method of module parameters display area (Un\G519)

This area stores the status of parameter setting of the FDL address setting method. (☞ Page 66 Module parameter)

Stored value	Description
0000H	"Setting Method Of FDL Address" is set to "Parameter Editor" in the "Module Parameter" window.
0001H	"Setting Method Of FDL Address" is set to "Information Saved In Module" in the "Module Parameter" window.
FFFFH (Default)	Parameter is not set.

Error

■Module error information (Un\G2040)

This area stores the status code of the error occurring on the module. (☞ Page 185 List of Status Codes)

The area is updated under the following conditions.

Condition	Details
An error occurs.	The status code is stored. When more than one error occurs, the smallest status code is stored.
The error cause is eliminated.	The corresponding status code is cleared. The status code of other existing error is stored.
The error is cleared.	This area is cleared. (☞ Page 172 Error information, Page 210 Error signals (X3) and (Y3))

■Extended diagnostic information area (Un\G2041 to Un\G2053)

This area sets extended diagnostic information sent to the DP-Master by the program. (☞ Page 158 Program example of notification request of extended diagnostic information)

- Data length (Un\G2041): Set the data length (2 bytes) of extended diagnostic information. Setting range is 0 to 24. When this area is set to 0 and 'Extended diagnostic information notification request signal' (Y2) is turned on, correction of the relevant error is notified to the DP-Master.
- Extended diagnostic information (Un\G2042 to Un\G2053): Set arbitrary data (max. 24 bytes) sent to the DP-Master.

Precautions

Extended diagnostic information is sent to the DP-Master as device-related diagnostic information (Device Related Diagnostics) specified by PROFIBUS. The formats are as follows.

Address (byte)	Name		Bit	Overview	Data stored in RJ71PB91V
+0H	Header byte	Block length	b0 to b5	Byte length including header bytes and diagnostic field	Specified data length (Un\G2041) + value of one byte
		Format type	b6 to b7	Device-related diagnostic information: 00	00 (fixed)
+1H and after	Diagnostic field		—	Arbitrary data	Data of the specified data length (Un\G2041) of extended diagnostic information (Un\G2042 to Un\G2053)

■Extended diagnostic information notification result (Un\G2054)

This area stores the result of the extended diagnostic information notification sent to the DP-Master.

When 'Extended diagnostic information notification completed signal' (X2) turns on, the status code is stored according to the result. (☞ Page 185 List of Status Codes) 0000H indicates that the notification has been completed successfully.

Station type

■Function mode display area (Un\G2253)

This area stores the function mode of the RJ71PB91V.

Stored value	Function mode	Model name displayed on the engineering tool	Station type
0000H	PROFIBUS-DP master mode	RJ71PB91V	DP-Master
1001H	PROFIBUS-DP slave mode	RJ71PB91V(S)	DP-Slave

Operation mode

■Current operation mode area (Un\G2254)

This area stores the current operation mode.

Stored value	Description
0000H	Normal operation mode (mode 0)
0002H	Self-diagnostic mode (mode 2)
0009H	Flash ROM clear mode

When the CPU module is reset or the system is turned off and on, the RJ71PB91V starts in the normal operation mode (mode 0).

■Operation mode change request area (Un\G2255)

This area sets the operation mode to which the module switches when 'Operation mode change request signal' (Y11) is on.

Setting value	Description
0000H	Sets the operation mode to normal operation mode (mode 0).
0002H	Sets operation mode to self-diagnostic mode (mode 2).
0009H	Sets operation mode to flash ROM clear mode.
FFFEH	Value that is set when the CPU module is reset or the system is turned off and on. (Default)

When a value out of the setting range is set to this area and 'Operation mode change request signal' (Y11) is turned on, 1 (completed with an error) is stored in 'Operation mode change result area' (Un\G2256). Because the default (FFFEH) is a value out of the setting range, an error will occur unless any other value is set.

■Operation mode change result area (Un\G2256)

This area stores the execution result of 'Operation mode change request signal' (Y11).

Stored value	Description
0	Completed successfully
1	Completed with an error (Operation mode change request has been issued with an invalid value set to 'Operation mode change request area' (Un\G2255).)

Communication watchdog timer

■Current communication watchdog timer value (Un\G2257)

This area stores the current operating communication watchdog timer value (Unit: 10ms) set by the parameters of the DP-Master. The stored value is valid while 'Data exchanging signal' (X1) is on.

When the DP-Master has gone down, the operation of the DP-Slave differs according to the stored value as shown below.

'Current communication watchdog timer value' (Un\G2257)	Item of the DP-Slave	When the communication with the DP-Master has completed successfully	When the DP-Master has gone down
0: There is no communication watchdog timer setting on the DP-Master.	Data sent to the DP-Master*1	Clear (0 data)	Hold*2
	Update of data in 'Output receive area' (Un\G0 to Un\G191)	Clear (0 data)	Hold*2
	'Data exchanging signal' (X1)	Off	On*2
1: Parameter error occurs.			
2 to 65025: The communication watchdog timer setting is on the DP-Master, and the setting value is the stored one.	Data sent to the DP-Master*1	Clear (0 data)	Clear (0 data)
	Update of data in 'Output receive area' (Un\G0 to Un\G191)	Clear (0 data)	Clear (0 data)
	'Data exchanging signal' (X1)	Off	Off

*1 Indicates data actually sent over the network. It differs from data stored in 'Input send area' (Un\G256 to Un\G447).

*2 When the communication watchdog timer is disabled on the DP-Master, no communication timeout error occurs even if the DP-Master goes down. Therefore, the DP-Slave operates in the same way as during normal communications.

Offline test

■Offline test status area (Un\G2258)

When the self-diagnostics test or initialization of the flash ROM is being performed or when an error is detected, the corresponding code will be stored. (☞ Page 174 Offline test, Page 185 List of Status Codes)

Address	Stored value		Item	Description
	Execution (normal code)	Error (status code)		
Un\G2258	0000H	—	Offline test	Completed successfully
	0001H	8001H	Self-diagnostic test	ROM check test
	0002H	8002H		Timer test
	0004H	8004H		MPU test
	0005H	8005H		RAM test
	0006H	8006H		2-port RAM test
	0007H	8007H		Swap port test
	00FFH	80FFH	Initialization of flash ROM	Flash ROM test

Data swap function

■Data swap function setting status (Un\G2259)

This area stores the current data swap function setting status. The stored value is valid while 'Data exchanging signal' (X1) is on.

- 0: Data swap function disabled
- 1: Data swap function enabled

A

Usage status

■Output receive area usage status (Un\G2272 to Un\G2283)

This area stores the current usage status of 'Output receive area' (Un\G0 to Un\G191). The stored value is valid while 'Data exchanging signal' (X1) is on.

The numbers 0 to 191 below are output receive area numbers, which indicate the place of the word in the data stored in 'Output receive area' (Un\G0 to Un\G191). (0 indicates the first word.) The bit corresponding to the output receive area number of the word being used turns on.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G2272	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G2273	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Un\G2274	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
Un\G2275	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
Un\G2276	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
Un\G2277	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
Un\G2278	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
Un\G2279	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112
Un\G2280	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128
Un\G2281	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144
Un\G2282	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160
Un\G2283	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177	176

Ex.

When b15 of Un\G2272 and b11 of Un\G2279 are on, the 16th and 124th words in 'Output receive area' (Un\G0 to Un\G191) are in use.

'Output receive area usage status' (Un\G2272 to Un\G2283)		Output receive area number	'Output receive area' (Un\G0 to Un\G191)	
Address	Bit		Stored data	Address
Un\G2272	b0	0	1st word	Un\G0
	b1	1	2nd word	Un\G1
	⋮	⋮	⋮	⋮
	b14	14	15th word	Un\G14
	b15 (on)	15	16th word (in use)	Un\G15
Un\G2273	b0	16	17th word	Un\G16
⋮	⋮	⋮	⋮	⋮
Un\G2279	b10	122	123rd word	Un\G122
	b11 (on)	123	124th word (in use)	Un\G123
	b12	124	125th word	Un\G124
⋮	⋮	⋮	⋮	⋮
Un\G2283	b14	190	191st word	Un\G190
	b15	191	192nd word	Un\G191

■Input send area usage status (Un\G2288 to Un\G2299)

This area stores the current usage status of 'Input send area' (Un\G256 to Un\G447). The stored value is valid while 'Data exchanging signal' (X1) is on.

The numbers 0 to 191 below are input send area numbers, which indicate the place of the word in the data stored in 'Input send area' (Un\G256 to Un\G447). (0 indicates the first word.) The bit corresponding to the input send area number of the word being used turns on.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G2288	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G2289	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Un\G2290	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
Un\G2291	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
Un\G2292	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
Un\G2293	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
Un\G2294	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
Un\G2295	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112
Un\G2296	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128
Un\G2297	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144
Un\G2298	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160
Un\G2299	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177	176

Ex.

When b15 of Un\G2288 and b11 of Un\G2295 are on, the 16th and 124th words in 'Input send area' (Un\G256 to Un\G447) are in use.

Input send area usage status (Un\G2288 to Un\G2299)		Input send area number	'Input send area' (Un\G256 to Un\G447)	
Address	Bit		Stored data	Address
Un\G2288	b0	0	1st word	Un\G256
	b1	1	2nd word	Un\G257
	⋮	⋮	⋮	⋮
	b14	14	15th word	Un\G270
	b15 (on)	15	16th word (in use)	Un\G271
Un\G2289	b0	16	17th word	Un\G272
⋮	⋮	⋮	⋮	⋮
Un\G2295	b10	122	123rd word	Un\G378
	b11 (on)	123	124th word (in use)	Un\G379
	b12	124	125th word	Un\G380
⋮	⋮	⋮	⋮	⋮
Un\G2299	b14	190	191st word	Un\G446
	b15	191	192nd word	Un\G447

A

Appendix 5 Processing Time

This section describes bus cycle time and transmission delay time.

Bus cycle time

When only one DP-Master is deployed

■Calculation formula of bus cycle time (Bc)

The following calculation formula provides bus cycle time (Bc) of the DP-Master.

The symbol in [ ] indicates the unit.

$$Bc[s] = Max\left(MSI, \sum_{i=1}^{n}(Pt(i) + Tsdi(M))\right) + Lr)$$

n = The number of DP-Slaves

Max (A, B) = The larger of A and B

Item	Description
MSI [s]	Minimum required time for polling cycle (Min. slave interval)*1
Pt(i) [s]	(Polling cycle of ith station) = Treq(i) + max_Tsdr(i) + Tres(i) • Treq(i) [s] = (Request transmission time of ith station) = {(Number of output bytes to ith station) + 9} × 11 [bit] ÷ (Transmission speed [bps]) • max_Tsdr(i) [s] = (Response time of ith station [TBit])*2*3 ÷ (Transmission speed [bps]) • Tres(i) [s] = (Response transmission time of ith station) = {(Number of input bytes from ith station) + 9} × 11 [bit] ÷ (Transmission speed [bps])
Tsdi(M) [s]	(Request/response processing time of DP-Master [TBit])*4 ÷ (Transmission speed [bps])
Lr [s]	(Data refresh time) = 5.50×10^{-3} + Number of DP-Slaves × 150×10^{-6}

*1 A value set in "Min. slave interval" of the "Master Settings" window of PROFIBUS Configuration Tool. (☞ Page 106 Master Settings)

*2 The maxTsdr value described in the GSD file of DP-Slaves.

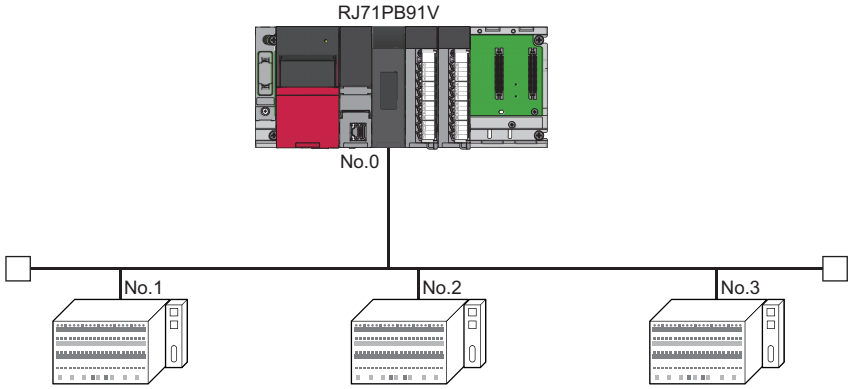
*3 The unit TBit (Bit Time) defines "1" as the time it takes to send one bit data.
The actual processing time depends on the transmission speed as follows.
When the transmission speed is 1.5Mbps
1 [TBit] = $1 \div (1.5 \times 10^{6}) = 0.667 \times 10^{-6}$[s]
When the transmission speed is 12Mbps
1 [TBit] = $1 \div (12 \times 10^{6}) = 0.083 \times 10^{-6}$[s]

*4 The Tsdi value specified in the GSD file of the RJ71PB91V.
The Tsdi value depends on the transmission speed as follows.
For the unit TBit, refer to *3.

Transmission speed	Request/response processing time of DP-Master
9.6kbps	70TBit
19.2kbps	
45.45kbps	
93.75kbps	
187.5kbps	
500kbps	150TBit
1.5Mbps	200TBit
3Mbps	250TBit
6Mbps	450TBit
12Mbps	800TBit

■Calculation example of bus cycle time

The following shows a calculation example of bus cycle time.



No.	Module model name	Description
0	DP-Master (FDL address 0)	• Transmission speed: 1.5Mbps • The number of DP-Slaves: 3
1	AJ95TB2-16T DP-Slave (FDL address 1) (compatible with DPV1/V2)	• Input: 0 point • Output: 16 points • Output data size: 2 bytes • Input data size: 0 byte
2	AJ95TB3-16D DP-Slave (FDL address 2) (compatible with DPV1/V2)	• Input: 16 point • Output: 0 points • Output data size: 0 bytes • Input data size: 2 byte
3	QJ71PB93D DP-Slave (FDL address 3) (compatible with DPV1/V2)	• Input: 1 word • Output: 2 words • Output data size: 4 bytes • Input data size: 2 byte

• MSI [s] value

MSI [s] = 80 × 100[μs] = 8.0 × 10^{-3}[s]

• Pt(i) [s] value

Item	DP-Slave		
	AJ95TB2-16T (FDL address 1)	AJ95TB3-16D (FDL address 2)	QJ71PB93D (FDL address 3)
Treq(i) [s]	{(2 + 9) × 11} ÷ (1.5 × 106) = 0.081 × 10^{-3}	{(0 + 9) × 11} ÷ (1.5 × 106) = 0.066 × 10^{-3}	{(4 + 9) × 11} ÷ (1.5 × 106) = 0.095 × 10^{-3}
Response time of ith station [TBit]	150	150	150
max_Tsdr(i) [s]	150 ÷ (1.5 × 106) = 0.1 × 10^{-3}	150 ÷ (1.5 × 106) = 0.1 × 10^{-3}	150 ÷ (1.5 × 106) = 0.1 × 10^{-3}
Tres(i) [s]	{(0 + 9) × 11} ÷ (1.5 × 106) = 0.066 × 10^{-3}	{(2 + 9) × 11} ÷ (1.5 × 106) = 0.081 × 10^{-3}	{(2 + 9) × 11} ÷ (1.5 × 106) = 0.081 × 10^{-3}
Pt(i) [s]	0.081 × 10^{-3} + 0.1 × 10^{-3} + 0.066 × 10^{-3} = 0.247 × 10^{-3}	0.066 × 10^{-3} + 0.1 × 10^{-3} + 0.081 × 10^{-3} = 0.247 × 10^{-3}	0.095 × 10^{-3} + 0.1 × 10^{-3} + 0.081 × 10^{-3} = 0.276 × 10^{-3}

• Tsdi(M) [s] value

Request/response processing time of DP-Master [TBit] = 200

$Tsdi(M)\ [s] = 200 \div (1.5 \times 106) = 0.13 \times 10^{-3}$

• Lr [s] value

$Lr\ [s] = 5.50 \times 10^{-3} + 3 \times 150 \times 10^{-6} = 5.95 \times 10^{-3}$

Based on the values above

$$\sum_{i=1}^{n} (Pt(i) + Tsdi(M)) + Lr = \{(Pt(1) + Tsdi(M)) + (Pt(2) + Tsdi(M)) + (Pt(3) + Tsdi(M))\} + Lr$$
$$= \{(0.377 \times 10^{-3}) + (0.377 \times 10^{-3}) + (0.406 \times 10^{-3})\} + 5.95 \times 10^{-3}$$
$$= 1.16 \times 10^{-3} + 5.95 \times 10^{-3}$$
$$= 7.11 \times 10^{-3}$$

The bus cycle time (Bc) is

$$Bc[s] = Max\ (MSI, \sum_{i=1}^{n} (Pt(i) + Tsdi(M)) + Lr)$$
$$= Max\ (8.0 \times 10^{-3}, 7.11 \times 10^{-3})$$
$$= 8.0 \times 10^{-3}[m]$$

When multiple DP-Masters are deployed

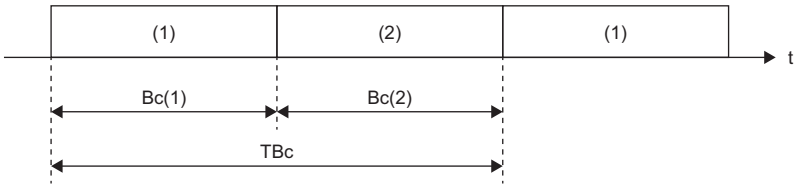
With multiple DP-Masters deployed on the same network, the following calculation formula provides their bus cycle time (Bc).

$$TBc[s] = \sum_{i=1}^{3} Bc(i)$$

n = The number of DP-Masters

Bc = The bus cycle time of each DP-Master (☞ Page 272 When only one DP-Master is deployed)

The following shows an example with two DP-Masters.



(1) Polling by DP-Master 1
(2) Polling by DP-Master 2

The total bus cycle time TBc can be calculated from TBc = Bc(1) + Bc(2).

Transmission delay time

Transmission delay time is the time needed for transmitting I/O data between the CPU module to which the RJ71PB91V is mounted and the PROFIBUS-DP network during I/O data exchanges.

The transmission delay time of input data and output data differ depending on the data consistency function settings.

Calculation formulas of transmission delay time are shown below.

The calculation formulas are described by using the following abbreviations.

Bc: Bus cycle time[*1][ms]

Scan: Scan time[ms]

Scan_rem: The time from when data is stored in the CPU module device to when the next END processing is performed [ms]

*1 When multiple DP-Masters are deployed on the same network, replace it with TBc.

When data consistency function is disabled

The following shows transmission delay times of reading/writing I/O data with the refresh settings enabled and data consistency function disabled, or by the MOV instruction or FROM/TO instructions.

■Transmission delay time of output data

Item	Transmission delay time on DP-Master	Transmission delay time on DP-Slave
Normal value	Bc × 1.5	Scan × 0.5 + 0.2
Maximum value	Bc × 2	Scan + 0.2

■Transmission delay time of input data

Item	Transmission delay time on DP-Master	Transmission delay time on DP-Slave
Normal value	Scan + Bc	Scan_rem + Bc × 0.5 + 0.2
Maximum value	Scan + Bc × 2	Scan_rem + Bc + 0.2

When data consistency function is enabled

The following shows transmission delay times of reading/writing I/O data with the refresh settings enabled and data consistency function enabled.

■Transmission delay time of output data

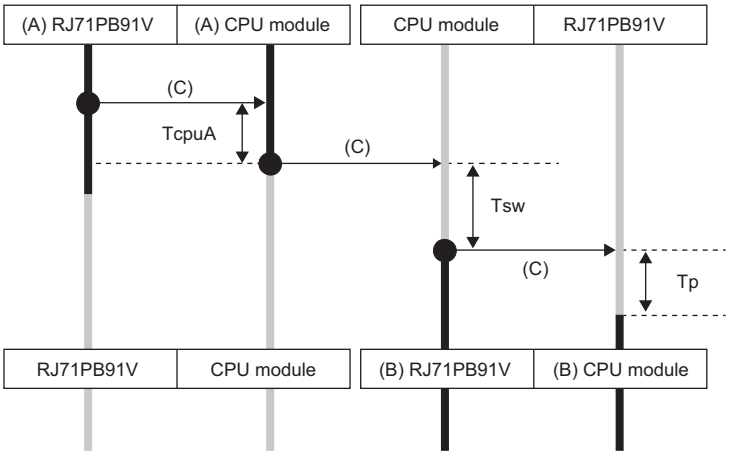
Item	Condition	Transmission delay time on DP-Master	Transmission delay time on DP-Slave
Normal value	—	Scan + Bc	Scan × 1.5 + 0.2
Maximum value	Scan × 2 ≤ Bc	Bc × 3	Scan × 2 + 0.2
	Scan × 2 > Bc	Scan × 2 + Bc × 2	

■Transmission delay time of input data

Item	Condition	Transmission delay time on DP-Master	Transmission delay time on DP-Slave
Normal value	—	Scan + Bc	Scan_rem + Bc × 0.5 + 0.2
Maximum value	Scan × 2 ≤ Bc	Scan + Bc	Scan_rem+Bc+0.2
	Scan ≤ Bc < Scan × 2	Scan + Bc × 2	
	Scan > Bc	Scan × 3	

System switching time

This section describes calculation formula of the time between when the RJ71PB91V transmits system switching request from the DP-Master of the control system (A) to the CPU module while system switching is being executed in the redundant system and when the RJ71PB91V starts control in the DP-Master of the new control system (B).



- System switching time when system switching due to DP-Slave errors is not executed or when OR condition is set in 'System switching condition setting'(Un\G23648): Tscu [ms]=TcpuA + Tsw + Tp + (SS × 2)
- System switching time when AND condition is set in 'System switching condition setting' (Un\G23648): Tsca [ms]=Tscu + (Nand × 20)

Variable	Description
TcpuA	Time between when system switching request is received from the RJ71PB91V of control system and when system switching request to the standby system is started in the CPU module of control system [ms] TcpuA [ms] = sequence scan time of the CPU module + 3
Tsw	System switching time of the process CPU (redundant mode) [ms] (MELSEC iQ-R CPU Module User's Manual (Application))
Tp	Internal processing time of the RJ71PB91V [ms] Tp[ms] = (the total byte number of I/O data length of all DP-Slaves*1 × transmission speed response time 1*2) + (the number of connected DP-Slaves × transmission speed response time 2*2) + common processing time*2
SS	Sequence scan time of the process CPU (redundant mode) [ms] (MELSEC iQ-R CPU Module User's Manual (Application))
Nand	Number of DP-Slaves set for system switching in 'System switching DP-Slaves specification' (Un\G23649 to Un\G23656) when AND condition is set in 'System switching condition setting' (Un\G23648)

*1 I/O data length of each DP-Slave can be checked in the "Slave Modules" window of PROFIBUS Configuration Tool.

*2 The following times differ depending on the transmission speed.

Transmission speed	Transmission speed response time 1	Transmission speed response time 2	Common processing time
9.6kbps	0.9000ms	1.8ms	500ms
19.2kbps	0.6000ms	1.4ms	250ms
93.75kbps	0.1800ms	1.0ms	60ms
187.5kbps	0.0900ms	1.0ms	50ms
500kbps	0.0350ms	1.0ms	40ms
1.5Mbps	0.0100ms	1.0ms	35ms
3Mbps	0.0070ms	0.9ms	35ms
6Mbps	0.0025ms	0.8ms	35ms
12Mbps	0.0020ms	0.8ms	30ms

Appendix 6 Differences Between QJ71PB92V and RJ71PB91V

This section describes the differences in PROFIBUS-DP module between MELSEC-Q series (QJ71PB92V) and MELSEC iQ-R series (when the RJ71PB91V is used as the DP-Master).

Performance

Item			QJ71PB92V	When the RJ71PB91V is used as the DP-Master
Type of PROFIBUS-DP station			DP-Master (Class 1)	
Transmission specifications	Electrical standard/characteristics		Compliant with EIA-RS485	
	Medium		Shielded twisted pair cable	
	Network configuration		Bus topology (or tree topology if repeaters are used)	
	Data link method		• Between DP-Masters: Token passing method • Between a DP-Master and DP-Slave: Polling method	
	Encoding method		NRZ	
	Transmission speed		☞ Page 277 The transmission speed and the transmission distance	
	Transmission distance			
	Number of connectable modules of the entire network		DP-Masters + DP-Slaves ≤ 126 modules (when the redundant system is configured, DP-Master of the control system + DP-Master of the standby system + DP-Slaves ≤ 126 modules	
	Number of connectable modules per segment		DP-Master + DP-Slaves + repeaters ≤ 32 modules (when the redundant system is configured, DP-Master of the control system + DP-Master of the standby system + DP-Slaves + repeaters ≤ 32 modules	
	Number of repeaters		Maximum of three repeaters between the DP-Master and any DP-Slaves (When the redundant system is configured, maximum of three repeaters between the DP-Masters and any DP-Slaves of both systems)	
	Maximum transmission data size	Input data	8192 bytes maximum (244 bytes maximum per DP-Slave)	
		Output data	8192 bytes maximum (244 bytes maximum per DP-Slave)	
Number of occupied I/O points			32	
Internal current consumption (5VDC)			0.57A	0.42A
Weight			0.13kg	0.16kg

The transmission speed and the transmission distance

Transmission speed	Transmission distance	
	QJ71PB92V	When the RJ71PB91V is used as the DP-Master
9.6kbps	1200m/segment	
19.2kbps		
45.45kbps	—	1200m/segment
93.75kbps	1200m/segment	
187.5kbps	1000m/segment	
500kbps	400m/segment	
1.5Mbps	200m/segment	
3Mbps	100m/segment	
6Mbps		
12Mbps		

A

LED

QJ71PB92V	When the RJ71PB91V is used as the DP-Master	Description of the differences
RUN LED		No differences with these LED
FAULT LED	ERR LED	Only names are unified to MELSEC iQ-R series.
—	MST LED	This LED is added to distinguish the RJ71PB91V which operates as a DP-Slave.
SD/RD LED		No differences with these LED
—	DIA LED	This LED is added for cases where the RJ71PB91V is operated as a DP-Slave. The specifications are same as DIA LED of the QJ71PB93D.
RSP ERR.	BF LED	Only the name has changed. BF is abbreviation for Bus Fault used for generally. The specifications are same as BF LED of the QJ71PB93D.
READY	—	This LED is deleted to duplicate the function with RUN LED.
TEST	—	This used for self-diagnostics, however delete this to create free area of buffer memory.
TOKEN	—	This LED is deleted to duplicate the function with SD/RD LED.
PRM SET	—	This LED is deleted since the usage frequency is low.

Appendix 7 Mounting the RJ71PB91V with a Remote Head Module

This chapter describes restrictions and a communication example when the RJ71PB91V is mounted with the remote head module.

Restrictions on functions and specifications

Functions

No functions are restricted when the RJ71PB91V is mounted with the remote head module.

Module parameter

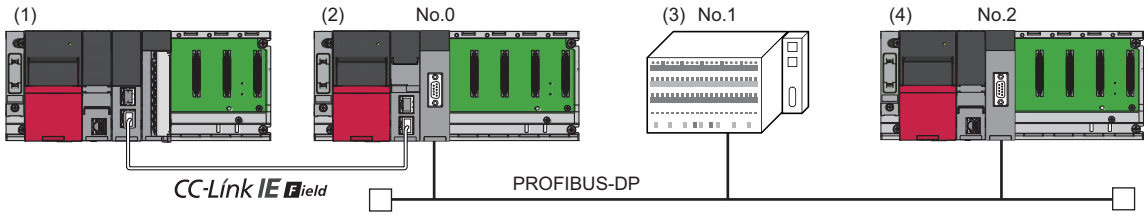
There are differences between when the RJ71PB91V is mounted with the CPU module and when the RJ71PB91V is mounted to the remote head module. For details, refer to the following.

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

Communication example

The following shows a communication example between the DP-Master of the CC-Link IE Field Network and the DP-Slaves of the PROFIBUS-DP network when the RJ71PB91V is mounted to the remote head module.

System configuration



No.	Station type	Module
(1)	CC-Link IE field network master station (network No.1, station No.0)	• Power supply module: R61P • CPU module: R04CPU • CC-Link IE Field Network master/local module: RJ71GF11-T2 (start I/O number: 0000H to 001FH) • Input module: RX10 (start I/O number: 0020H to 002FH)
(2)	Intelligent device station on CC-Link IE Field Network (network No.1, station No.1) No.0: DP-Master on PROFIBUS-DP network (FDL address 0)	• Power supply module: R61P • CC-Link IE Field Network remote head module: RJ72GF15-T2 • PROFIBUS-DP module: RJ71PB91V (start I/O number: 0000H to 001FH)
(3)	No.1: DP-Slave on PROFIBUS-DP network (FDL address 1)	ET200S from Siemens K.K. (HighFeature(Cu))
(4)	No.2: DP-Slave on PROFIBUS-DP network (FDL address 2)	• Power supply module: R61P • CPU module: R04CPU • PROFIBUS-DP module: RJ71PB91V(S) (start I/O number: 0000H to 001FH)

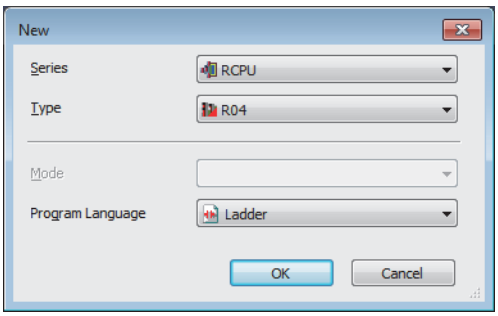
A

DP-Master settings of the CC-Link IE Field Network

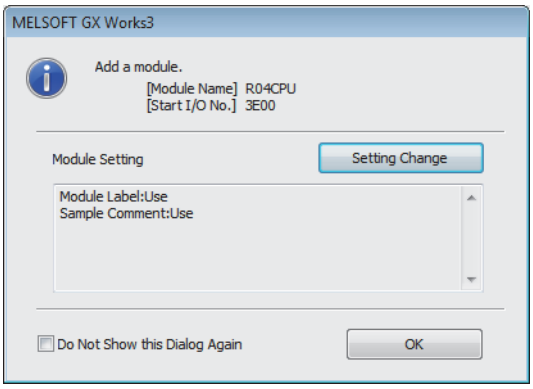
Connect the engineering tool to the CPU module of the DP-Master of the CC-Link IE Field Network, and set the parameters.

1. Set the CPU module as follows.

[Project] ⇨ [New]



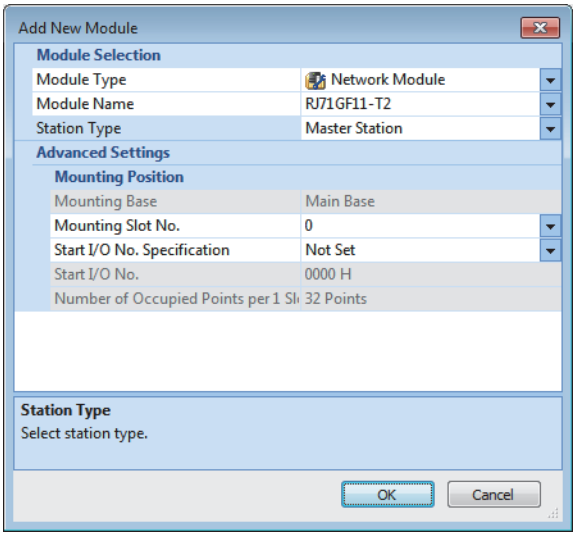
2. Click the [Setting Change] button and set the [Module Label] to [Use].



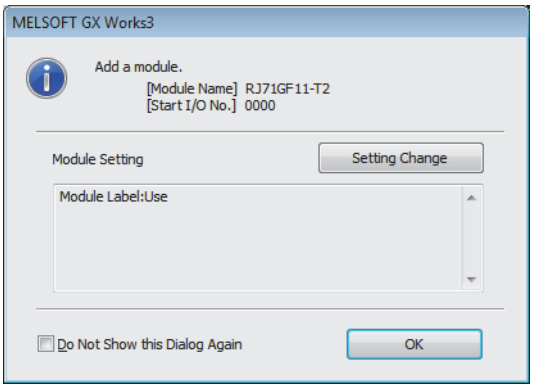
3. Click the [OK] button to add module labels of the CPU module.

4. Set the CC-Link IE Field Network master/local module as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]



5. Click the [OK] button to add the module label of the CC-Link IE Field Network master/local module.



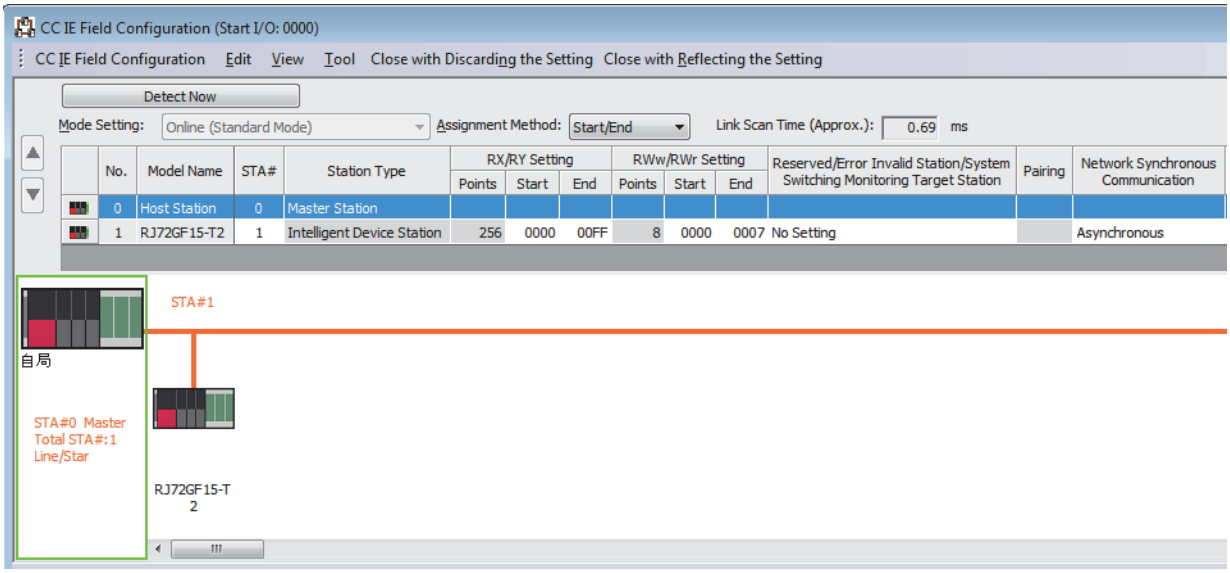
6. Set "Required Settings" of the CC-Link IE Field Network master/local module as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71GF11-T2] ⇨ [Required Settings]

Item	Setting
Station Type	
Station Type	Master Station
Network No.	
Network No.	1
Station No.	
Setting Method	Parameter Editor
Station No.	0
Parameter Setting Method	
Setting Method of Basic/Application Settings	Parameter Editor

7. Set "Network Configuration Settings" of "Module Parameter" of the CC-Link IE Field Network master/local module as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71GF11-T2] ⇨ [Basic Setting] ⇨[Network Configuration Settings]



8. Set "Refresh Setting" of "Module Parameter" of the CC-Link IE Field Network master/local module as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71GF11-T2] ⇨ [Basic Setting] ⇨ [Refresh Setting]

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF		Module Label				
-	SW	512	00000	001FF		Module Label				
1	RX	256	00000	000FF		Specify Device	X	256	01000	010FF
2	RY	256	00000	000FF		Specify Device	Y	256	01000	010FF
3	RWw	256	00000	000FF		Specify Device	W	256	00000	000FF
4	RWr	256	00000	000FF		Specify Device	W	256	01000	010FF
5										

9. Write the set parameters to the CPU module or the SD memory card of the CPU module. Then, reset or turn off and on the CPU module.

[Online] ⇨ [Write to PLC]

Point

In this example, default values were used for parameters that are not shown above. For the parameters of the CC-Link IE Field Network master/local module, refer to the following.

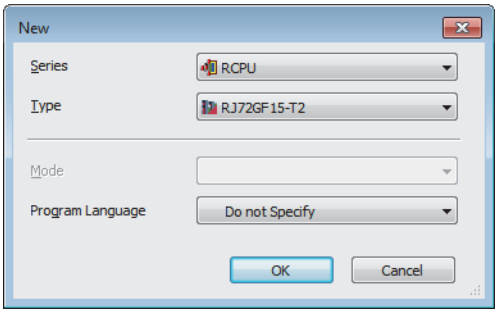
MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)

Remote head module settings

Connect the engineering tool to the remote head module, and set the parameters of the intelligent device station of the CC-Link IE Field Network and the DP-Master of the PROFIBUS-DP Network.

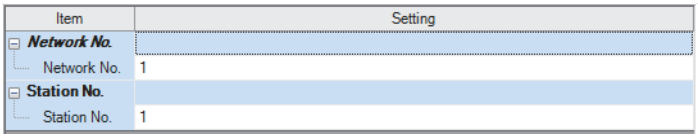
1. Set the remote head module as follows.

[Project] ⇨ [New]



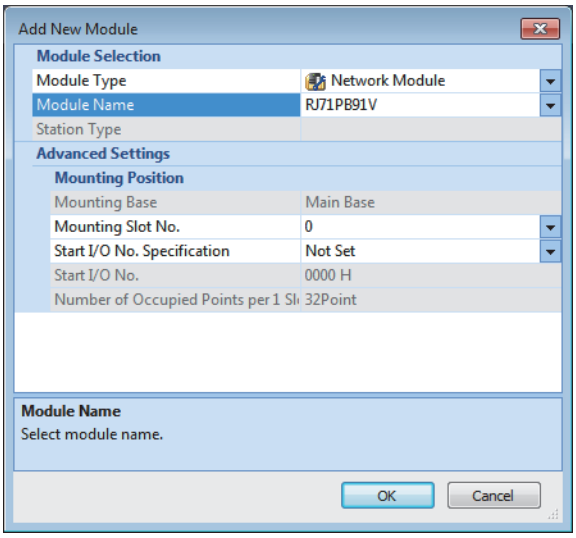
2. Set "Require Settings" of the remote head module as follows.

[Navigation window] ⇨ [Parameter] ⇨ [RJ72GF15-T2] ⇨ [CPU Parameter] ⇨ [Network Required Setting



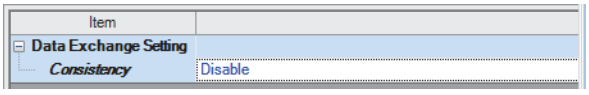
3. Add the RJ71PB91V used as the DP-Master of the PROFIBUS-DP Network as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]



4. Set "Basic Setting" of the RJ71PB91V as follows. (☞ Page 39 Data Consistency Function)

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [Module Parameter] ⇨ [Basic Setting]



5. Start PROFIBUS Configuration Tool from the engineering tool.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting]

A

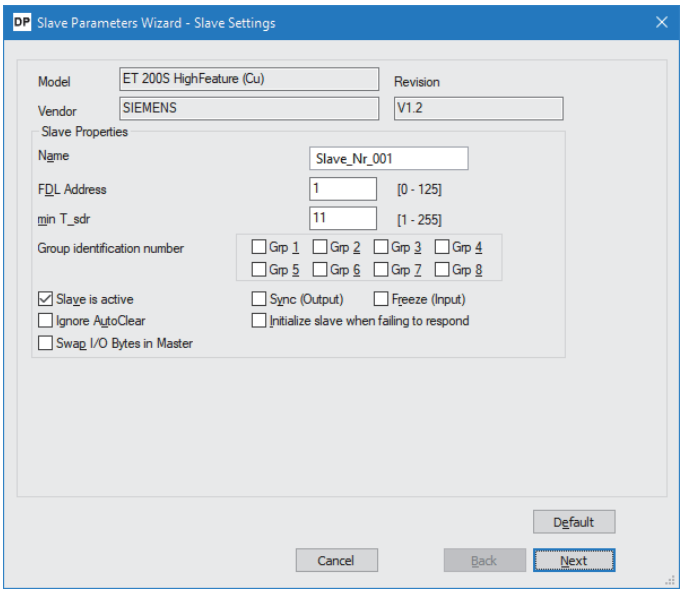
6. Add the DP-Slaves to the project.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ [Global GSD Database] tab ⇨ Target DP-Slave ⇨ Right-click ⇨ [Add Slave to Project]

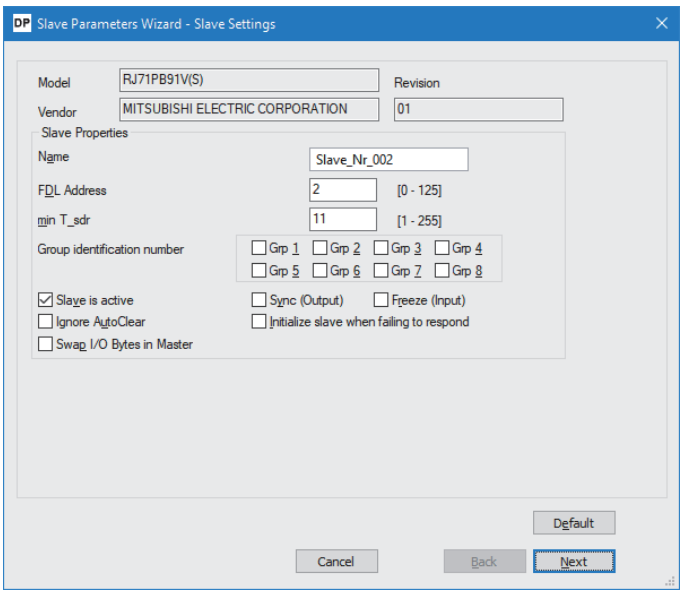
7. Set the items in the "Slave Settings" window as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ Target DP-Slave ⇨ Right-click ⇨ [Slave Settings]

- DP-Slave (FDL address 1)

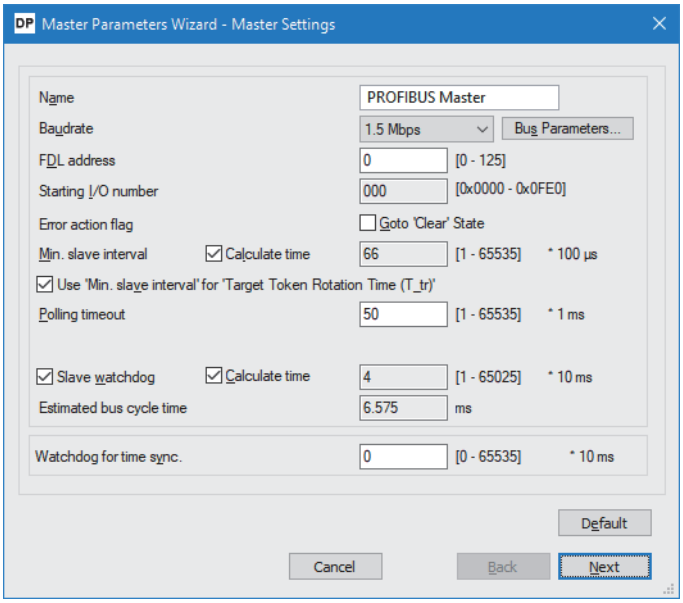


- DP-Slave (FDL address 2)

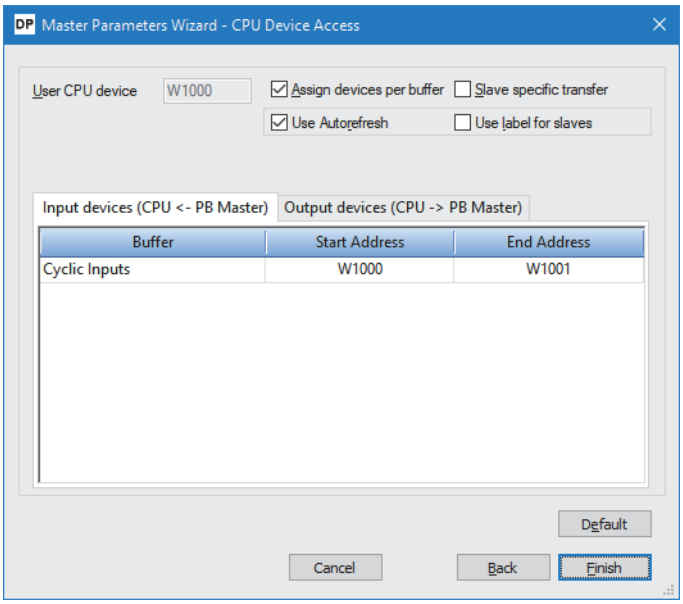


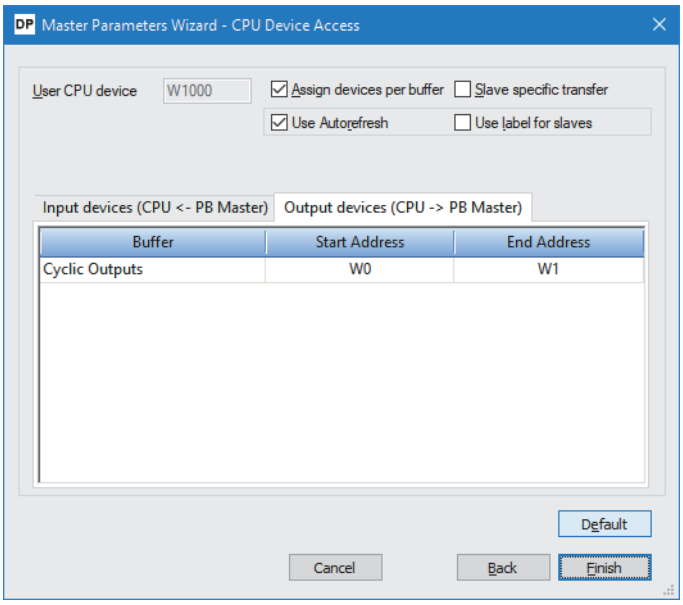
8. Set the items of "Master Settings" as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PB91V] ⇨ [PROFIBUS Module Setting] ⇨ [I/O no.:0x0000/FDL:0 'RJ71PB91V'] ⇨ Right-click ⇨ [Master Settings]



9. Click the [Next] button in the "Master Settings" window, and set the items of "CPU Device Access" as follows.





10. Click the [Finish] button to close the "Master Settings" window.

DP-Slave settings of the PROFIBUS-DP network

Set the DP-Slaves that configure the PROFIBUS-DP network. For the DP-Slaves that use the RJ71PB91V, connect the engineering tool to the CPU module, and set the parameters. (☞ Page 132 Creating a new project)
For the settings of the DP-Slaves that use a module other than the RJ71PB91V, refer to the manual of the module used.

Checking the system status

CC-Link IE Field Network

Check whether data are properly linked to the DP-Master of the CC-Link IE Filed Network after setting the parameters to the remote head module.
To check the data link status, use the CC-Link IE Field Network diagnostics of the engineering tool. (📖 MELSEC iQ-R CC-Link IE Field Network User's Manual (Application))

1. Connect the engineering tool to the CPU module of the DP-Master.
2. Start the CC-Link IE Field Network diagnostics.

[Diagnostics] ⇨ [CC-Link IE Field Diagnostics]

PROFIBUS-DP network

Check whether communications are properly performed between the DP-Master and the DP-Slaves.
Communications are being performed properly if the LEDs on the DP-Master and bits corresponding to the buffer memory areas on the DP-Master are in the following state after execution of the program.

- LEDs on the DP-Master

Name	Status
RUN LED	On
ERR LED	Off
BF LED	Off

- Bit corresponding to buffer memory areas on the DP-Master

Name	Status
'Slave status area (Normal communication detection)' (Un\G23040.0 to Un\G23040.1)	On
'Slave status area (Diagnostic information detection)' (Un\G23057.0 to Un\G23057.1)	Off

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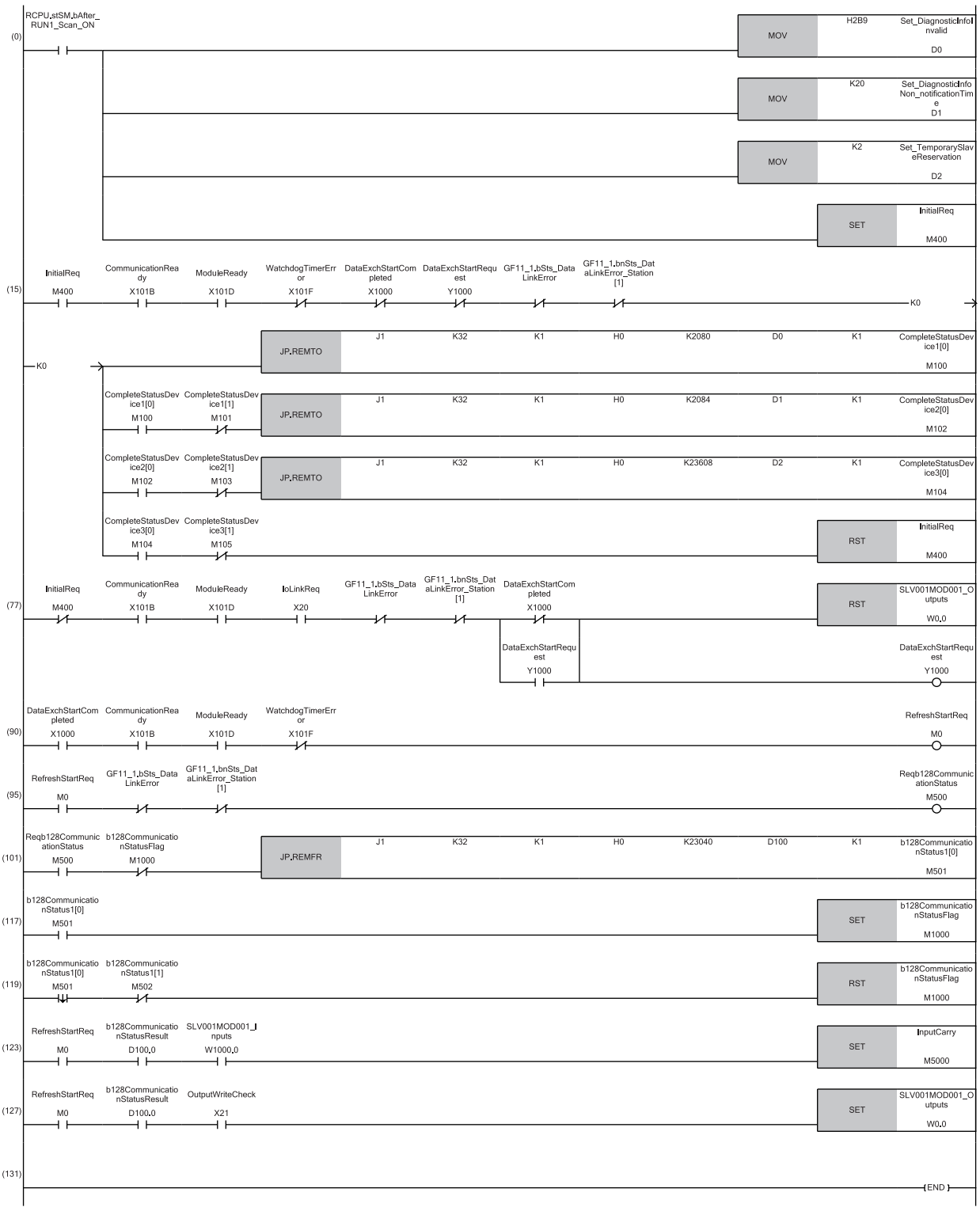
Program example

Write a program to the CPU module of the DP-Master of the CC-Link IE Field Network.

The module label of the CC-Link IE Field Network master/local module is used.

Classification	Label name	Description	Device
Module label	RCPU.stSM.bAfter_RUN1_Scan_ON	ON for one scan after RUN	SM402
	GF11_1.bSts_DataLinkError	Data link error of the local FDL address	SB0049
	GF11_1.bnSts_DataLinkError_Station[1]	Data link status of each station (FDL address 1)	SW00B0.0
Label to be defined	Define global labels as shown below.		

	Label Name	Data Type		Class	Assign (Device/Label)
1	DataExchStartCompleted	Bit	...	VAR_GLOBAL	X1000
2	CommunicationReady	Bit	...	VAR_GLOBAL	X101B
3	ModuleReady	Bit	...	VAR_GLOBAL	X101D
4	WatchdogTimerError	Bit	...	VAR_GLOBAL	X101F
5	DataExchStartRequest	Bit	...	VAR_GLOBAL	Y1000
6	Set_DiagnosticInfoInvalid	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D0
7	Set_DiagnosticInfoNon_notificationTime	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D1
8	Set_TemporarySlaveReservation	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2
9	SLV001MOD001_Outputs	Bit	...	VAR_GLOBAL	W0.0
10	SLV001MOD001_Inputs	Bit	...	VAR_GLOBAL	W1000.0
11	InitialReq	Bit	...	VAR_GLOBAL	M400
12	IoLinkReq	Bit	...	VAR_GLOBAL	X20
13	RefreshStartReq	Bit	...	VAR_GLOBAL	M0
14	OutputWriteCheck	Bit	...	VAR_GLOBAL	X21
15	InputCarry	Bit	...	VAR_GLOBAL	M5000
16	Reqb128CommunicationStatus	Bit	...	VAR_GLOBAL	M500
17	b128CommunicationStatus1	Bit(0..1)	...	VAR_GLOBAL	M501
18	b128CommunicationStatusResult	Bit	...	VAR_GLOBAL	D100.0
19	CompleteStatusDevice1	Bit(0..1)	...	VAR_GLOBAL	M100
20	CompleteStatusDevice2	Bit(0..1)	...	VAR_GLOBAL	M102
21	CompleteStatusDevice3	Bit(0..1)	...	VAR_GLOBAL	M104
22	b128CommunicationStatusFlag	Bit	...	VAR_GLOBAL	M1000



(0) Set Diagnostic information invalid setting area (D0), Diagnostic information non-notification time setting area (D1), and Temporarily reserved station specification request area (D2), and turn on Initialization request (M400).

(15)Set Diagnostic information invalid setting area (D0), Diagnostic information non-notification time setting area (D1), and Temporarily reserved station specification request area (D2), and turn off Initialization request (M400).

(77)Write data to the output area on the first device (W0.0), and turns on 'Data exchange start request signal' (Y1000).

(104)Turn on Refresh start request (M0).

(109)Turn on Slave status area acquisition request (M500).

(115 to133)Store the result of slave status area (normal communication detection) on the first device into D100.0. When the result of the slave status area (normal communication detection) on the first device is normal, repeat the program.

(137)Perform Input processing (M5000) from input data (1st word (b0)).

(158)Set output data to the output area on the first device (W0.0) according to the output settings of the DP-Slaves.

Appendix 8 Using the Module in the Redundant System with Redundant Extension Base Unit

This chapter describes restrictions and precautions for using the RJ71PB91V that is mounted on the extension base unit in the redundant system.

Restrictions on functions and specifications

PROFIBUS-DP network configuration

When the RJ71PB91V is used as the DP-Master, the RJ71PB91V cannot be mounted on the extension base unit in a redundant system with redundant extension base unit.

When the RJ71PB91V is mounted on the extension base unit in a redundant system with redundant extension base unit, use the RJ71PB91V as a DP-Slave.

Appendix 9 Added and Enhanced Functions

The following table lists the added and enhanced functions of the RJ71PB91V.

Added or enhanced function	Firmware version of the RJ71PB91V	Software version of PROFIBUS Configuration Tool
DP-Slave type	"03" or later	—
Redundant system	"04" or later	"1.01B" or later
"Devices for Slave-Specific Transfer" added to "Setup Tasks"	—	"1.04E" or later
"Slave specific transfer" added to the "CPU Device Access" window	—	"1.04E" or later
Reflection timing of the PROFIBUS module setting	"07" or later	—
Automatic generation option for a program to turn on 'Data exchange start request signal' (Y0) when an unregistered program is automatically generated by updating the PROFIBUS labels	—	"1.05F" or later
Setting a refresh target device in the auto refresh settings per DP-Slave	—	"1.06G" or later
Reading PROFIBUS Configuration Tool projects with the engineering tool	—	"1.07H" or later

Restricted functions of the CPU module

The following table lists the restricted functions with firmware version of the CPU module or the remote head module.

Function	Firmware version				Reference
	RnCPU and RnENCPU	Process CPU	Safety CPU	Remote head module	
Data consistency function	"28" or later	"12" or later	"14" or later	"06" or later	Page 39 Data Consistency Function

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MEMO

REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
December 2017	SH(NA)-081857ENG-A	First edition
April 2018	SH(NA)-081857ENG-B	■Added function DP-Slave type ■Added or modified parts SAFETY PRECAUTIONS, RELEVANT MANUALS, TERMS, Chapter 1, 2, 3, 4, 5, APPENDIX
August 2018	SH(NA)-081857ENG-C	■Added function Redundant system ■Added or modified parts SAFETY PRECAUTIONS, TERMS, Section 1.13, 2.1, 3.2, 4.8, 5.5, 5.6, 5.7, 5.8, APPENDIX 1, 3, 5, 6, 7
May 2020	SH(NA)-081857ENG-D	■Added or modified parts TERMS, GENERIC TERMS AND ABBREVIATIONS, Section 3.2, 4.2, 4.8, Appendix 7
October 2020	SH(NA)-081857ENG-E	■Added or modified parts SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, RELEVANT MANUALS, TERMS, Section 1.13, 4.6, 4.7, Appendix 8
April 2021	SH(NA)-081857ENG-F	■Added or modified parts SAFETY PRECAUTIONS, Section 2.1, 2.2, 3.1, 3.2, 3.3, 4.2, Appendix 7, 9
November 2021	SH(NA)-081857ENG-G	■Added or modified parts SAFETY PRECAUTIONS, Section 1.11, 2.1, 3.3, 5.2, Appendix 9
April 2022	SH(NA)-081857ENG-H	■Added or modified parts SAFETY PRECAUTIONS, Section 1.13, 3.2, 3.3, Appendix 9
December 2022	SH(NA)-081857ENG-I	■Added or modified parts SAFETY PRECAUTIONS, Section 2.1, 2.2, 3.3, Appendix 9
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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.

(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.

(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.

(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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MODEL: RJ71PB91V-U-OU-E
MODEL CODE: 13JX80

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