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FATEC

Mitsubishi Programmable Controllers Training Manual
CC-Link IE Controller Network
(for GX Works3)

SAFETY PRECAUTIONS

(Always read these instructions before using the products.)

When designing the system, always read the relevant manuals and give sufficient consideration to safety.
During the exercise, pay full attention to the following points and handle the product correctly.

[EXERCISE PRECAUTIONS]

⚠ WARNING

● Do not touch the terminals while the power is on to prevent electric shock.
● Before opening the safety cover, turn off the power or ensure the safety.

⚠ CAUTION

● Follow the instructor's direction during the exercise.
● Do not remove the module of the demonstration machine or change wirings without permission.
  Doing so may cause failures, malfunctions, personal injuries and/or a fire.
● Turn off the power before mounting or removing the module.
  Failure to do so may result in malfunctions of the module or electric shock.
● When the demonstration machine (such as X/Y table) emits abnormal odor/sound, press the "Power switch" or "Emergency switch" to turn off.
● When a problem occurs, notify the instructor as soon as possible.

MEMO

REVISIONS

*The text number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
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INTRODUCTION

This school textbook helps you to easily understand a CC-Link IE Controller Network system with the MELSEC iQ-R series. For a good understanding of the CC-Link IE Controller Network system features, this textbook describes the system using GX Works3.

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup) [SH-081256ENG]	Specifications, procedures before operation, system configuration, wiring, and communication examples of Ethernet, CC-Link IE Controller Network, and CC-Link IE Field Network	e-Manual PDF
MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application) [SH-081258ENG]	Functions, parameter settings, troubleshooting, and buffer memory of CC-Link IE Controller Network	e-Manual PDF
MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks) [SH-081266ENG]	Instructions for the CPU module, instructions dedicated for intelligent function modules, and standard functions/standard function blocks	e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configuration of GX Works3, parameter settings, and operation method of the online function	e-Manual PDF

Point

e-Manual refers to the Mitsubishi 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.

ABBREVIATIONS AND TERMS

The following table lists the abbreviations and terms used in this textbook.

Term	Description
Baton pass	A token to send data over a network
Buffer memory	A memory in an intelligent function module, where data that is received/sent from/to the CPU module (such as setting values and monitoring values) is stored.
CC-Link IE Controller Network-equipped module	A generic term for the following modules when the CC-Link IE Controller Network function is used: • RJ71GP21-SX • RJ71EN71 • RnENCPU
Control station	A station that controls the entire network. This station can perform cyclic transmission and transient transmission with all stations. Only one control station can be used in a network.
CPU module	A generic term for the MELSEC iQ-R series CPU module
Cyclic transmission	A function by which data is periodically exchanged among stations on the network using link devices
Data link	A generic term for cyclic transmission and transient transmission
Dedicated instruction	An instruction for using functions of the module
Device	A device (X, Y, M, D, or others) in a CPU module
Disconnection	A process of stopping data link if a data link error occurs
Engineering tool	Another term for the software package for the MELSEC programmable controllers
Ethernet device	A generic term for the devices supporting IP communications (such as personal computers)
Ethernet-equipped module	A generic term for the following modules when the Ethernet function is used: • RJ71EN71 • CPU module
I/O master station	A station that controls the communications using link devices (LX, LY). Up to two I/O master stations (block 1 and block 2) can be set for one network, regardless of the type of station (control or normal station).
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
Label	A label that represents a device in a given character string
Link device	A device (LB, LW, LX, LY, SB, SW) in a CC-Link IE Controller Network-equipped module
Link input (LX)	Information input from a station in a block to the I/O master station
Link output (LY)	Information output from the I/O master station to a station in a block
Link refresh	Automatically transfers data between the link devices (LB, LW, LX, LY, SB, SW) of the CC-Link IE Controller Network-equipped module and devices of the CPU module, or between the link devices (SB, SW) of the CC-Link IE Controller Network-equipped module and the module labels of the CPU module. Link refresh is executed in END processing of the sequence scan of the CPU module.
Link register (LW)	Word data sent from each station on the network
Link relay (LB)	Bit data sent from each station on the network
Link scan (link scan time)	Time required for all the stations on the network to transmit data. The link scan time depends on data volume and the number of transient transmission requests.
Link special register (SW)	Word data that indicates the operating status and data link status of a CC-Link IE Controller Network-equipped module
Link special relay (SB)	Bit data that indicates the operating status and data link status of a CC-Link IE Controller Network-equipped module
MELSECNET/10	The abbreviation for the MELSECNET/10 network system
MELSECNET/H	The abbreviation for the MELSECNET/H network system
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. GX Works3 automatically generates this label, which can be used as a global label.
Network module	A generic term for the following modules: • Ethernet interface module • CC-Link IE Controller Network module • Module on CC-Link IE Field Network • MELSECNET/H network module • MELSECNET/10 network module • RnENCPU (network part)
Normal station	A station that performs cyclic transmission and transient transmission with the control station and other normal stations
RAS	The abbreviation for Reliability, Availability, and Serviceability. This term refers to the overall usability of automated equipment.
READ	A generic term for the JP.READ and GP.READ
RECV	A generic term for the JP.RECV and GP.RECV

Term	Description
RECVS	A generic term for the G.RECVS and Z.RECVS
Relay station	A station that includes two or more network modules. Transient transmission is performed through this station to stations on other networks
REQ	A generic term for the J.REQ, JP.REQ, G.REQ, and GP.REQ
Reserved station	A station reserved for future use. This station is not actually connected, but counted as a connected station.
Return	A process of restarting data link when a station recovers from an error
RIRD	A generic term for the J.RIRD, JP.RIRD, G.RIRD, and GP.RIRD
RIWT	A generic term for the J.RIWT, JP.RIWT, G.RIWT, and GP.RIWT
RnENCPU	A generic term for the R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, and R120ENCPU
Routing	A process of selecting paths for communications with other networks. There are two types of routing: dynamic routing that auto-selects the communication routes, and static routing where communication routes are arbitrarily set.
RRUN	A generic term for the J.RRUN, JP.RRUN, G.RRUN, GP.RRUN, Z.RRUN, and ZP.RRUN
RSTOP	A generic term for the J.RSTOP, JP.RSTOP, G.RSTOP, GP.RSTOP, Z.RSTOP, and ZP.RSTOP
RTMRD	A generic term for the J.RTMRD, JP.RTMRD, G.RTMRD, GP.RTMRD, Z.RTMRD, and ZP.RTMRD
RTMWR	A generic term for the J.RTMWR, JP.RTMWR, G.RTMWR, GP.RTMWR, Z.RTMWR, and ZP.RTMWR
Seamless communications	Communications that allow users to access a different kind of networks without having to consider the differences as if data was exchanged within one single network
SEND	A generic term for the JP.SEND and GP.SEND
Shared group number	A number to share cyclic data with any given stations. Cyclic data can be shared only with the stations of the same group number as that of the own station.
SREAD	A generic term for the JP.SREAD and GP.SREAD
SWRITE	A generic term for the JP.SWRITE and GP.SWRITE
Transient transmission	A function of communications with another station, which is used when requested by a dedicated instruction or the engineering tool
Transient transmission group number	A number for transient transmission to any given stations. By dividing the transient transmission target stations into groups, data is sent to the stations of the same transient transmission group number.
UINI	A generic term for the G.UINI, GP.UINI, Z.UINI, and ZP.UINI
WRITE	A generic term for the JP.WRITE and GP.WRITE
ZNRD	A generic term for the J.ZNRD and JP.ZNRD
ZNWR	A generic term for the J.ZNWR and JP.ZNWR

MEMO

1 OVERVIEW

1.1 CC-Link IE Controller Network

CC-Link IE Controller Network is an integrated network to transmit data seamlessly from an information system to production sites. In addition to control information data, information processing data such as maintenance data and device setting data of equipment information can be transmitted.

CC-Link IE

IE: Industrial Ethernet

CC-Link IE Controller Network is an industrial controller network based on Ethernet.

1.2　Overview

The CC-Link IE Controller Network system has higher functions, higher speed, and larger capacity than those of the existing MELSECNET/H network system (PLC to PLC network).
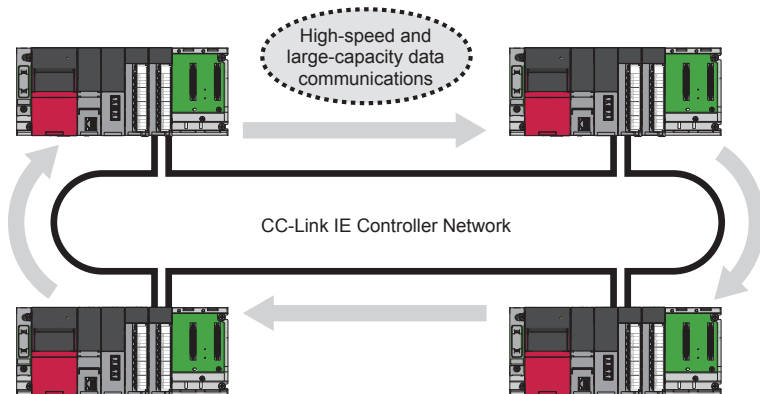
Point

CC-Link IE Controller Network modules and MELSECNET/H modules cannot be used in the same network. (They are designed to be used for different networks.)

- CC-Link IE Controller Network module: For CC-Link IE Controller Network
- MELSECNET/H module: For MELSECNET/H and MELSECNET/10 networks

1.3   Features

This section describes the features of CC-Link IE Controller Network.
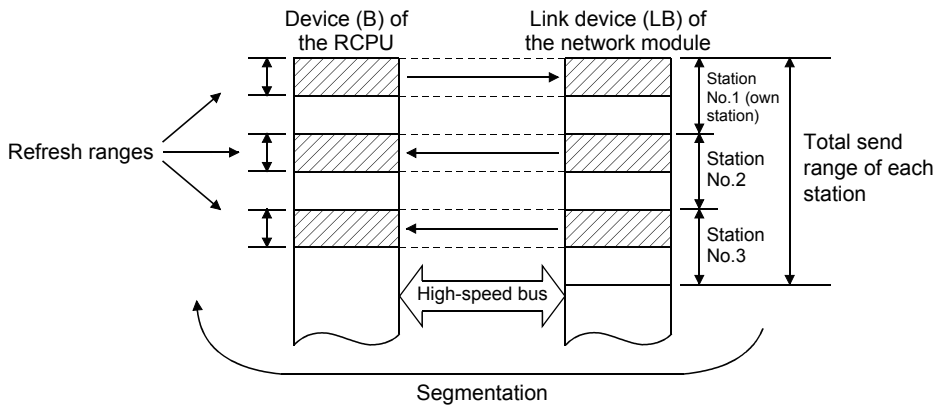
1.3.1   Cyclic transmission

High-speed communication system

- CC-Link IE Controller Network allows high-speed data communications of 1Gbps.
- Reducing (segmenting) link refresh points to the CPU module enables refresh only for a required range. Therefore, link refresh time and transmission delay time can be shortened.

- The CPU module can directly read/write data from/to link devices (LB/LW/LX/LY/SB/SW) of the CC-Link IE Controller Network module by sequence programs. (☞ Page 3 - 34 Directly Accessing Link Devices of the Network Module)

Large and flexible system configuration

- Use of link devices of the CC-Link IE Controller Network module enables periodic large-capacity data communications among stations on the same network.
- The link devices have a large capacity. The link relay (LB) has 32768 points (4K bytes) and the link register (LW) has 131072 points (256K bytes).
- The maximum number of link points is 32K bytes (16K points) per station.

Cyclic data integrity assurance

This function assures the cyclic data integrity in units of 32 bits or station-based units.

The following three methods are available for cyclic data integrity assurance.

○: Assured, ×: Not assured

Method		Description	Availability	
			Link refresh	Direct access to link devices
32-bit data assurance		Assures data in units of 32 bits. Data is automatically assured by satisfying the assignment conditions of link devices. (☞ App. - 73 32-bit data assurance)	○	○
Assurance of data of more than 32 bits	Station-based block data assurance	Assures data in station-based units. Data is assured by enabling the station-based block data assurance in the parameter setting. (☞ App. - 74 Station-based block data assurance of cyclic data)	○	×
	Interlock program	Assures data of more than 32 bits. Data is assured by providing interlock circuits in programs. (☞ App. - 75 Interlock program example)	○	○

Point

Link scans are performed asynchronously with link refresh.

Therefore, when the following cyclic data of 32 bits or more is handled, new and old data may be mixed in units of 16 bits depending on the link refresh timing.

- Floating-point data
- Current value or command speed value of a positioning module
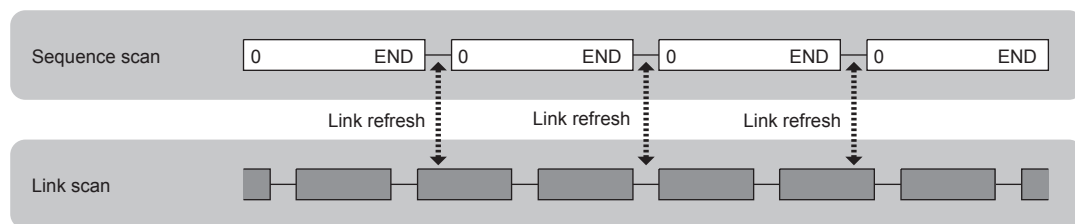
Cyclic transmission punctuality assurance

The link scan time is kept constant using the following methods.

Method	Description	Advantage	Disadvantage
Specification of the number of transient transmissions	Specify the number of transient transmissions within one link scan.	The link scan time can be minimized while it is kept constant.	If the network status is unstable, the link scan time may not be kept constant.
Constant link scan	Specify the link scan time.	Even if the network status is unstable or the number of transient transmissions varies, the link scan time can be kept constant.	If the actual link scan time is longer than the link scan time specified, the operation is performed based on the actual link scan time.

Point

While this function is used to keep the link scan time constant, the transmission delay time is not kept constant by this function. The transmission delay time is affected by a factor such as an increase of the sequence scan time.

■Specification of the number of transient transmissions

When the fluctuation in link scan time needs to be eliminated, the link scan time can be kept constant by performing a specified number of transient transmissions during one link scan at each station.
 • When the actual number of transient transmissions is less than the specified one: Dummy data is sent to cover the shortfall.
 • When the actual number of transient transmissions exceeds the specified one: They are divided and transmitted in several link scans.

Ex.
When the specified number is 2

Link scan time is constant since each station sends a specified number of transient transmissions.

●─── Cyclic transmission
⇦ Transient transmission
⇠ Transient transmission (dummy transmission)
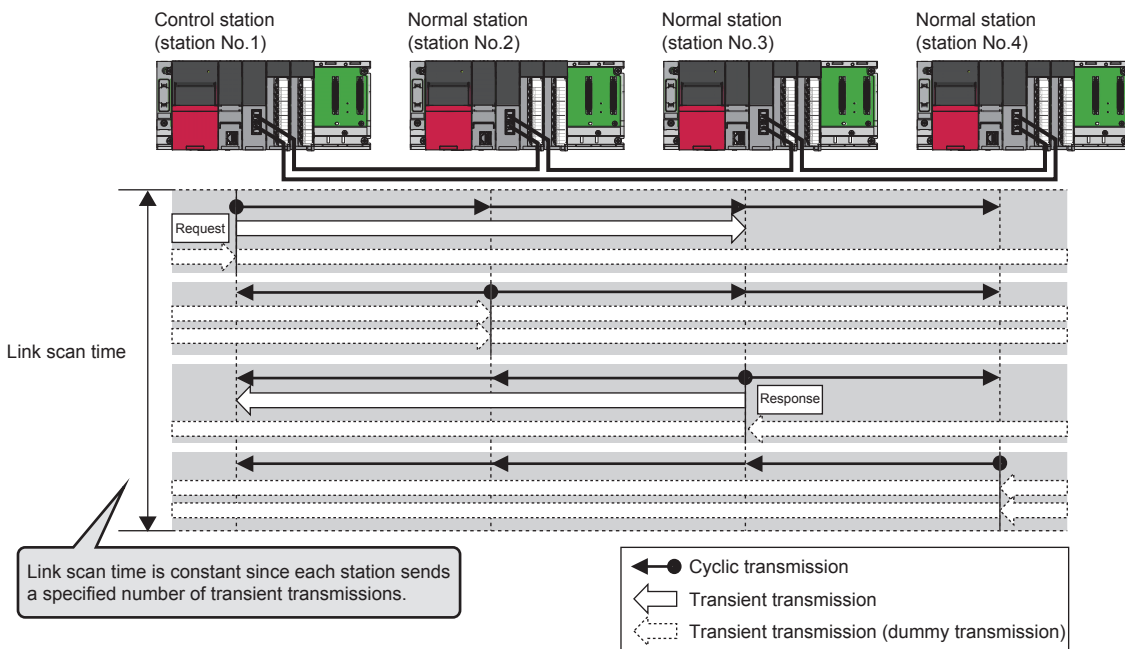
■Constant link scan

If the network status is unstable, the link scan time can be kept constant by specifying the link scan time at the control station to allow for possible fluctuations in the link scan time.

Group cyclic transmission

This function is used to divide the stations within the network into groups and specify the stations that share cyclic data (shared group).

This setting allows cyclic data to be shared among the stations having the same shared group number and not to be received from those having a different shared group number.

Stations having no shared group number assigned will share cyclic data with all stations.

Ex.

The station having no shared group number assigned (station No.1) will share cyclic data with all stations.

The stations having a shared group number assigned (station No.2 to 5) will share cyclic data with the stations of the same shared group number and the station without a shared group number (station No.1).
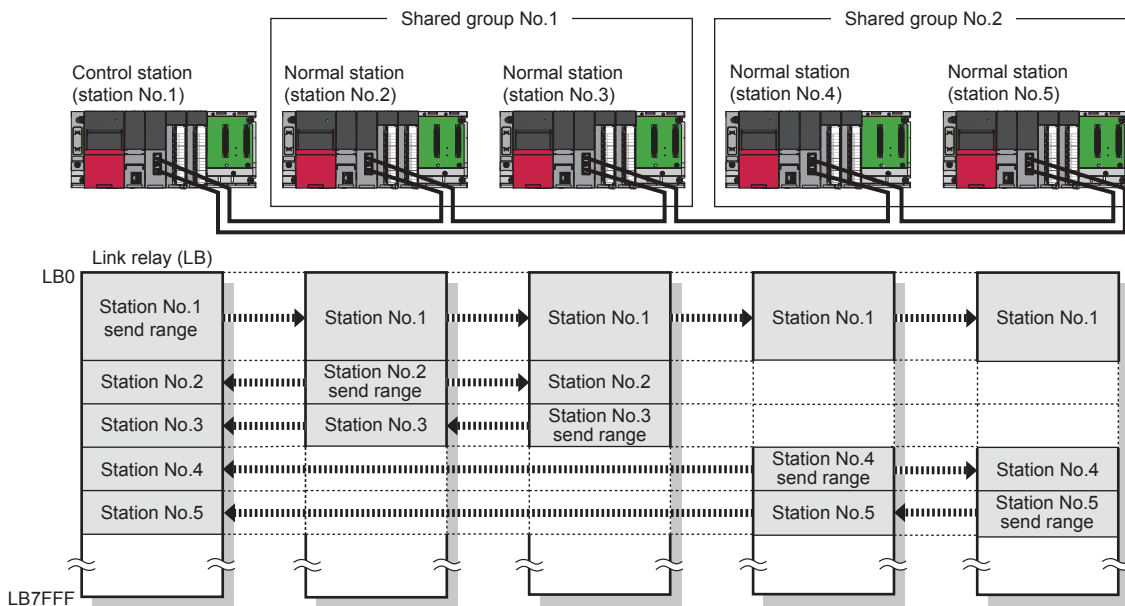
Point

Use this function for the following purposes.
 • All stations need to share the data of the station controlling production lines.
 • Data sharing is not desired between the stations that control different machines.

Since each station receives only the cyclic data from any given stations, the number of link refresh points can be reduced, resulting in a shorter link refresh time.

Number of send points extension

When one CC-Link IE Controller Network-equipped module is mounted, the number of send points per station is 16K points for both the link relay (LB) and the link register (LW).

Use any of the following methods to extend the number of send points for CC-Link IE Controller Network-equipped modules.
 • Number of send points extension by using extended mode (Recommended)
 • Number of send points extension by using multiple modules

Point

The number of send points extension by using extended mode is recommended because it allows more send points to be set than the number of send points extension by using multiple modules. Use the number of send points extension by using multiple modules only for the following purposes.
 • To add a station that requires more than the number of 16K send points in a network comprising CC-Link IE Controller Network modules that do not support the extended mode
 • To replace an existing CC-Link IE Controller Network module which is configured with the number of send points extension by using multiple modules with a MELSEC iQ-R series CC-Link IE Controller Network-equipped module without changing programs

■Number of send points extension by using extended mode

This function allows a CC-Link IE Controller Network-equipped module to be set to extended mode using an engineering tool so that the number of send points per station will be extended to a maximum of 32K points for the link relay (LB) and 128K points for the link register (LW) in one module.

■Number of send points extension by using multiple modules

This function extends the number of send points by mounting multiple CC-Link IE Controller Network-equipped modules of the same network number with one CPU module.

Mounting one additional module can extend the number of send points per station by 16K points for both the link relay (LB) and the link register (LW).

Up to eight modules can be mounted with one CPU module, allowing the number of send points per station to be extended up to 32K points for the link relay (LB) and 128K points for the link register (LW).[1]

*1 The number of send points must not exceed the maximum number of link points per network. (🕮 MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup))

Ex.

When the number of send points is extended by mounting two CC-Link IE Controller Network-equipped modules (LW)

- Link relay (LB): Up to 32K points
- Link register (LW): Up to 32K points
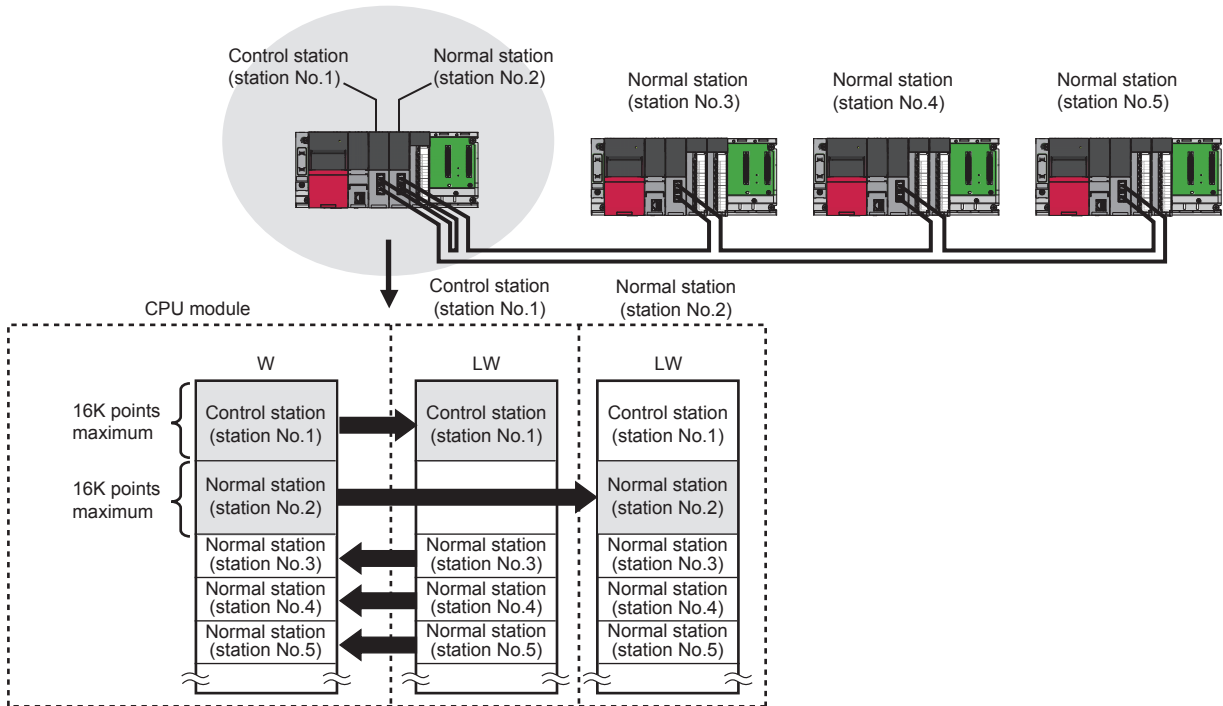
Reception status when an error occurs

When there is a data link faulty station on CC-Link IE Controller Network, the link device status is as follows.
- Normally operating station: Holds the data received from the faulty station immediately before the error.
- Faulty station: Holds the data received from other stations immediately before the error.
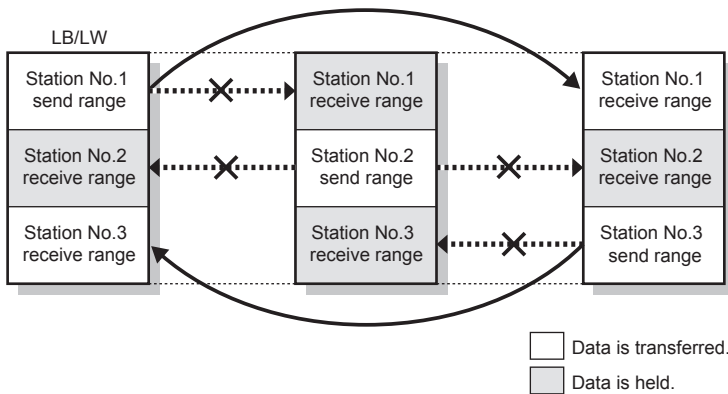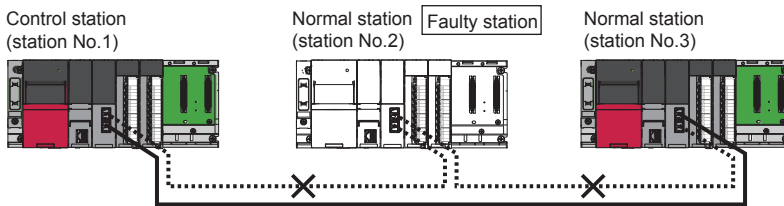
Cyclic transmission stop and restart

This function is used to stop the cyclic transmission during debugging and other operations. (The programmable controller stops receiving data from other stations and sending data from the own station.) The function is also used to restart the stopped cyclic transmission. Transient transmission does not stop.
Cyclic transmission is stopped and restarted using the link start/stop of the CC-Link IE Controller Network diagnostics.

1.3.2 Transient transmission

This function performs data communications with other stations when a request is issued by using dedicated instructions and the engineering tool. This function enables data communications with different networks.

- For the instructions for receiving/sending data from/to other stations on CC-Link IE Controller Network, the data length is the same as that of MELSECNET/H network (960 words).
- The maximum number of networks is 239 (1 to 239).

Communications within the same network

This function performs the transient transmission to other stations using dedicated instructions and the engineering tool. (📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks))
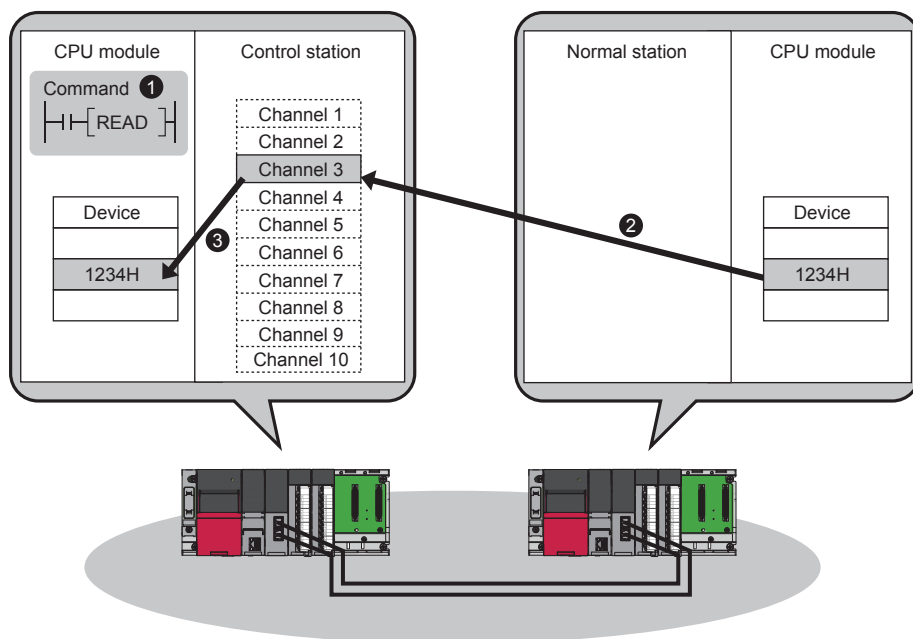
Seamless access to different networks

The engineering tool can seamlessly access a system configured with different networks via CC-Link IE Controller Network for tests or monitoring. (☞ Page 1 - 20 Multi-network system)
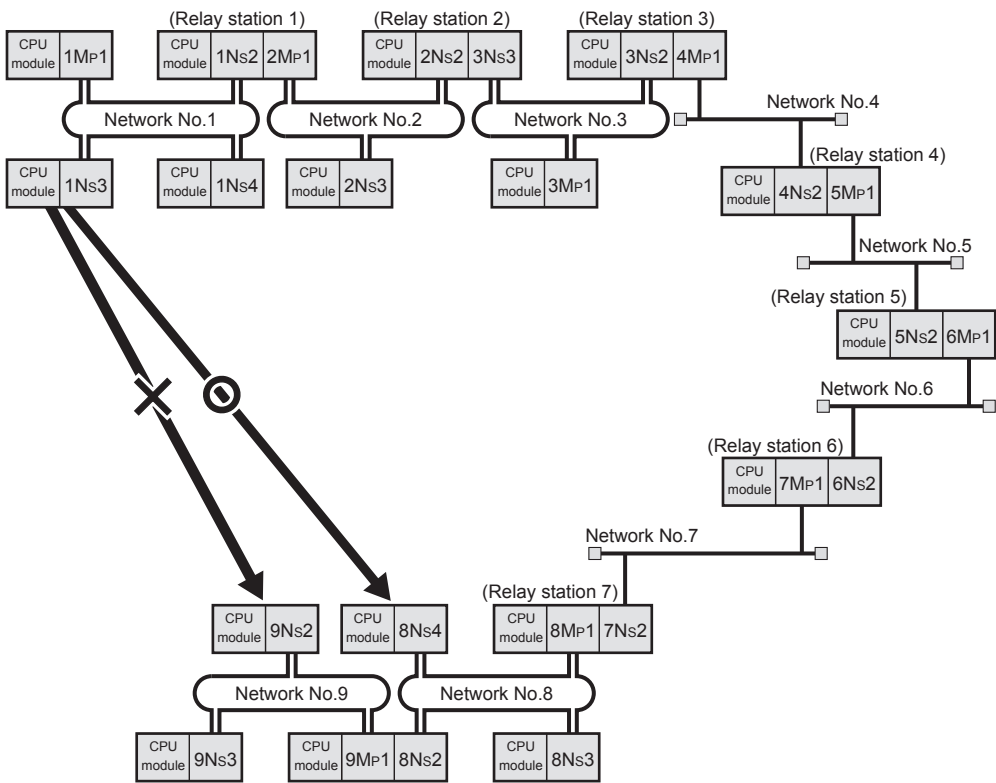
1.3.3 RAS functions

- Continuation of communications at system down of the control station
  Even if the control station goes down, a normal station (sub-control station) will take over the control to continue data link.
- Disconnection of a faulty cable and station
  Any disconnected cable or faulty station can be isolated from the network, and data link can be continued among normally operating stations.
- Automatic return when a disconnected station becomes normal
  When a station disconnected from a network due to a data link error recovers from the error, the station is automatically reconnected to the network and restarts data link.
  This automatic return does not affect data link.
- Detection of a faulty cable
  A cable fault can be detected as a cause of a communication error.
- Detection of a cable insertion error
  Incorrect cable connection between OUT and IN can be detected as a cause of loopback or disconnection from the network.
- Detection of a duplicated control station and duplicated station number
  Duplication of a control station or station number can be detected as a cause of loopback or disconnection from the network.

1.3.4 More simplified network configuration by using GX Works3

- Visualization of parameter settings with drop-down menus and dialogue boxes allows easy parameter settings.
- GX Works3 sets all the required parameters, such as the station type, network number, and station number. (Module parameter)
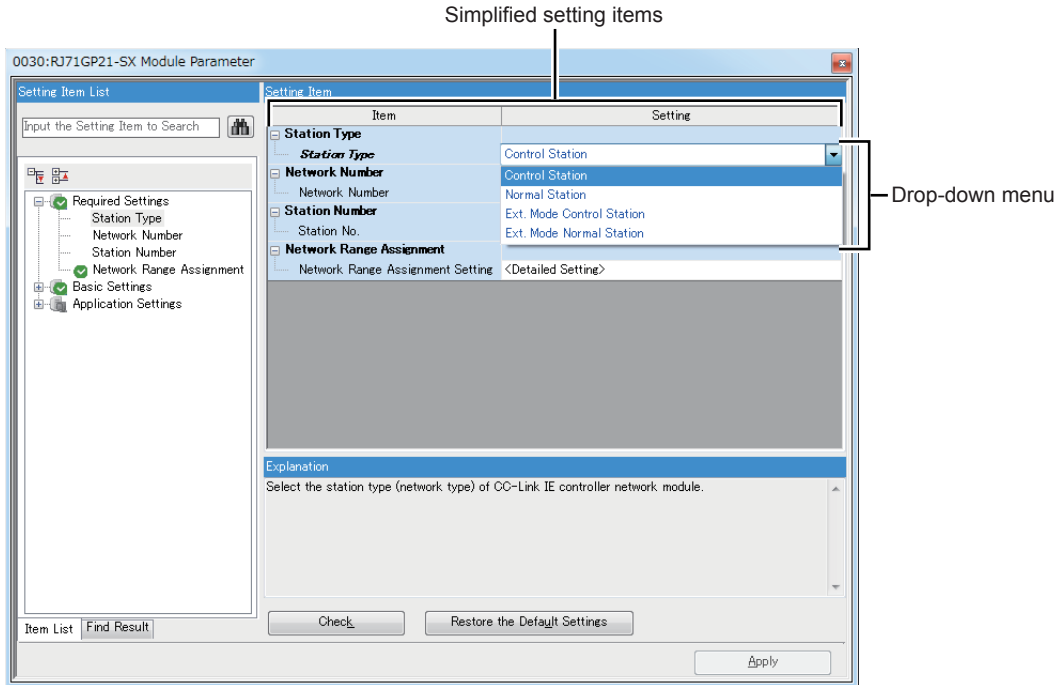
- Troubleshooting has been simplified by using "CC-Link IE Control Diagnostics".
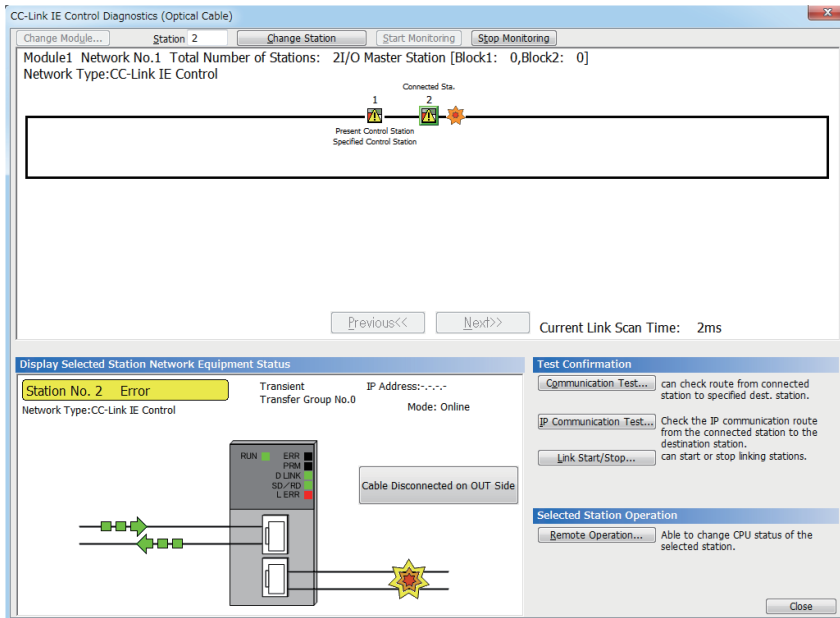
1.3.5 Function list

This section describes the functions of CC-Link IE Controller Network. For details on the functions, refer to the following.

📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application)

Cyclic transmission

○: Available, △: Partially available, ×: Not available

Function		Description	Availability	
			Control station	**Normal station**
Communications with other stations	Communications using LB and LW	Allows each station to write data to its own station send range of a link device (LB, LW) and send them to all other stations on the network.	○	○
	Communications using LX and LY	Exchanges data between the I/O master station that controls LX and LY and another station on a one-to-one (1:1) basis.	○	○
Access to devices and link devices	Link refresh	Automatically transfers data between the link devices (LB, LW, LX, LY, SB, SW) of the CC-Link IE Controller Network-equipped module and devices of the CPU module, or between the link devices (SB, SW) of the CC-Link IE Controller Network-equipped module and the module labels of the CPU module.	○	○
	Direct access to link devices	Directly accesses the link devices of the CC-Link IE Controller Network-equipped module from the program.	○	○
Cyclic data integrity assurance		Assures the cyclic data integrity in units of 32 bits or station-based units.	○	○
Interlink transmission		Transfers the link device (LB, LW) data of a CC-Link IE Controller Network-equipped module to another network module at a relay station.	○	○
Cyclic transmission punctuality assurance		Keeps the link scan time constant using the following methods. • Specification of the number of transient transmissions: Specifies the number of transient transmissions within one link scan. • Constant link scan: Specifies the link scan time.	○	×
Group cyclic transmission		Divides the stations within the network into groups and specifies the stations that share cyclic data (shared group). This setting allows cyclic data to be shared among the stations having the same shared group number and not to be received from those having a different shared group number. Stations having no shared group number assigned will share cyclic data with all stations.	○	○
Number of send points extension by using extended mode		Sets a CC-Link IE Controller Network-equipped module to the extended mode using an engineering tool so that the number of send points per station will be extended to a maximum of 32K points for the link relay (LB) and 128K points for the link register (LW) in one module.	○	○
Cyclic transmission stop and restart		Stops the cyclic transmission during debugging and other operations. (Data reception from other stations and data sending from the own station stop.) The function is also used to restart the stopped cyclic transmission. Transient transmission does not stop.	○	○

Transient transmission

○: Available, △: Partially available, ×: Not available

Function	Description	Availability	
		Control station	**Normal station**
Communications within the same network	Performs the transient transmission to other stations using dedicated instructions and the engineering tool.	○	○
Communications with different networks	Performs the transient transmission seamlessly to stations on different networks using dedicated instructions and the engineering tool.	○	○
Dedicated instruction	An instruction for using functions of the module (📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks))	△	○
Group transient transmission	Sends data to all stations of the same transient transmission group number by dividing the transient transmission target stations into groups.	○	○

RAS

○: Available, △: Partially available, ×: Not available

Function	Description	Availability	
		Control station	Normal station
Automatic return	Automatically returns the station disconnected from the network due to a data link error to the network when it recovers and restarts data link.	○	○
Loopback function	Continues data link with normal stations even if a cable disconnection or faulty station is detected.	○	○
Control station switching	Continues data link with a normal station (sub-control station) that serves as a control station even if the control station goes down.	×	○
Normal station disconnection	Disconnects only the normal station where an error occurs, and continues the data link with the stations that are operating normally. In a line topology, all stations connected after the faulty station are disconnected.	○	×

Diagnostics

○: Available, △: Partially available, ×: Not available

Function		Description	Availability	
			Control station	Normal station
CC-Link IE Controller Network diagnostics		Checks the status of CC-Link IE Controller Network using the engineering tool. The error locations, error causes, and corrective actions can be checked in the engineering tool.	○	○
Diagnostics of the module	Module communication test	Checks the hardware inside the CC-Link IE Controller Network-equipped module. This test should be performed when the communications are unstable.	○	○
Diagnostics of own network	Cable test	Checks the connection status of the Ethernet cables.[1]	○	○
Diagnostics of other network	Communication test	Checks whether the communication path for transient transmission from the own station to the destination station is correct or not.	○	○
	IP communication test	Checks whether no error occurs in the communication path when the IP packet transfer function is used.	○	○

*1 The optical fiber cable cannot be checked.

Others

○: Available, △: Partially available, ×: Not available

| Function	Description	Availability	
		Control station	Normal station
Reserved station specification	Specifies stations reserved for future use. The reserved stations are not actually connected, but counted as connected stations. The stations are not detected as faulty stations even though they are not actually connected.	○	×
Interrupt request to CPU module	Makes an interrupt request to the CPU module to start the interrupt program if the interrupt conditions preset using the engineering tool are satisfied. Interrupt conditions are based on the changes in the link devices (LB, LW, LX) and the network status (SB, SW) checked every link scan or the data reception status of the channel specified via the RECVS instruction.	○	○
IP packet transfer function	Performs communications in a protocol such as FTP and HTTP using the specified IP address of an Ethernet device, over CC-Link IE Controller Network. With this function, two networks of CC-Link IE Controller Network and Ethernet are not required, resulting in reduced wiring cost.	○	○
Station number setting using a program	Sets the station numbers of a normal station (own station) using a program. When there are normal stations with the same program and network parameters (excluding the station numbers), setting the station numbers using a program allows project data items other than the station number to be the same, leading to reduced development work hours. (📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks))	×	○

1.4 Abbreviations in Text, Tables, and Figures

■Abbreviation

Abbreviation	Name
M_P	Control station
N_S	Normal station

■Symbol format

☐M$_P$☐

Station No. (1 to 120)
Abbreviation (MP: Control station, NS: Normal station)
Network No. (1 to 239)
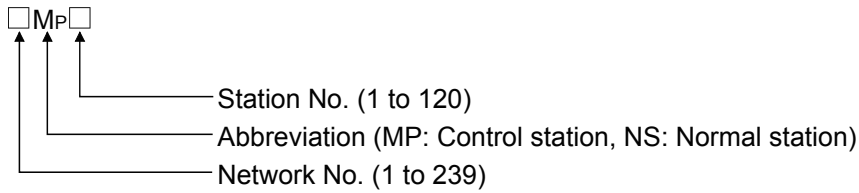
Ex.

Network No.3, Control station, Station No.6: 3M$_P$6

Network No.5, Normal station, Station No.3: 5N$_S$3

1.5 System Configuration of CC-Link IE Controller Network

This section describes the system that can be configured with CC-Link IE Controller Network.

1.5.1 Single-network system

For MELSEC iQ-R series, CC-Link IE Controller Network is configured using optical fiber cables for RJ71GP21-SX or Ethernet cables for RJ71EN71.

Restriction 👋

CC-Link IE Controller Network of the optical fiber cable and CC-Link IE Controller Network of the Ethernet cable cannot be combined by using a media converter (optical fiber cable ⇔ Ethernet cable).

Optical duplex loop

Connect the RJ71GP21-SX in a loop by using optical fiber cables. One control station and 119 normal stations (120 stations in total) can be connected.

Any station number can be set as the control station. Note that only one control station can be set for a network.

In the following system, the station No.1 is set as the control station.
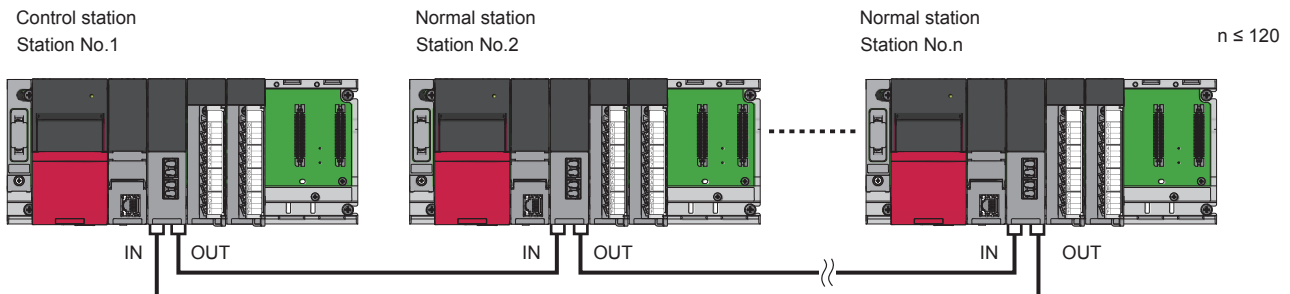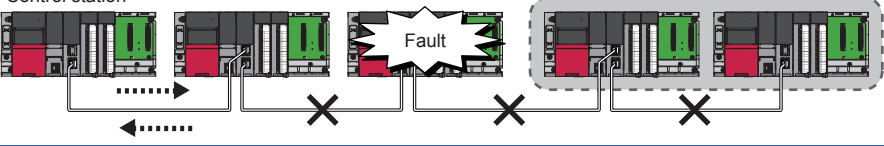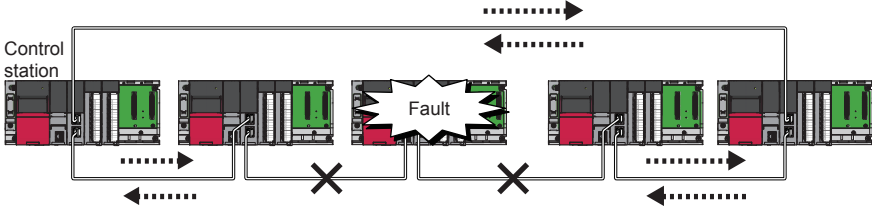
The RJ71GP21-SX has an IN connector and OUT connector. Connect the IN connector of own station to the OUT connector of another station and the OUT connector of own station to the IN connector of another station.

Ethernet cable

For the RJ71EN71, configure a network in star topology, line topology, or ring topology using the Ethernet cables.

Star topology and line topology can be combined in a network. Ring topology cannot be combined with star or line topology.

Item	Description
Star topology	The network is configured into a star shape using a switching hub and Ethernet cables. Normal stations can be easily added to the network using this topology.[1] When an error occurs in a normal station, data link can be continued with the stations that are operating normally.
Line topology	The network is configured into a line using Ethernet cables. A switching hub is not required.[1] When an error occurs in a normal station, the stations connected after the faulty station will be disconnected. Line topology
Ring topology	The network is configured into a ring using Ethernet cables. A switching hub is not required.[1] When an error occurs in a normal station, data link can be continued with the stations that are operating normally. (For the RJ71EN71, ring topology is available only when "CC-Link IE Control" is selected as network type for P1 connector.) Ring topology

[1] Add/remove normal stations one by one. If multiple normal stations are added/removed at a time, all stations on the network will be reconnected, and an error may momentarily occur in all the stations.

1.5.2 Multi-network system

This function performs the transient transmission seamlessly to stations on different networks using dedicated instructions and the engineering tool.
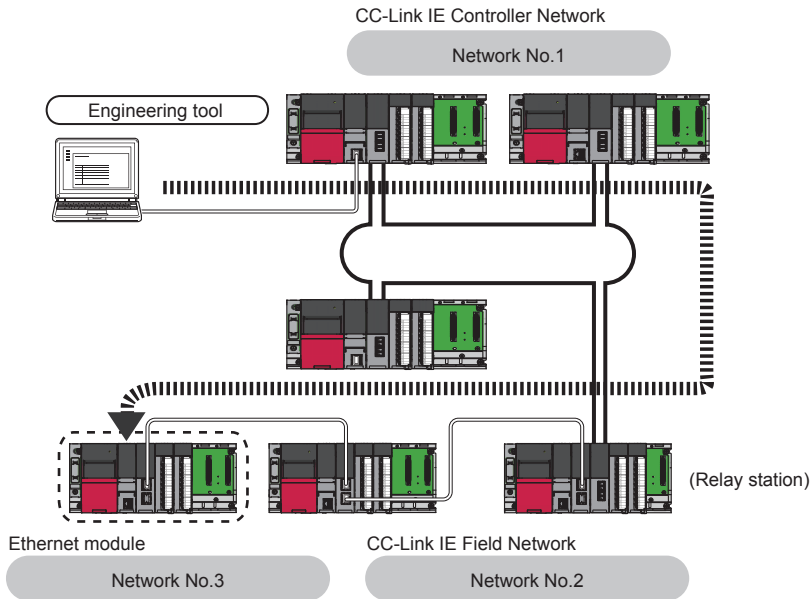
Point

Communications can be made with stations up to eight networks apart (number of relay stations: 7).

When the networks consist of only MELSEC iQ-R series

Communication paths are automatically set for communications with the following networks of MELSEC iQ-R series.

- Ethernet
- CC-Link IE Controller Network
- CC-Link IE Field Network

■Setting method

Check that "Dynamic Routing" in "Application Settings" is set to "Enable".

Point

- Communication paths are automatically set, but they can also be manually set.
- Communication paths cannot be automatically set to Ethernet-equipped modules connected via a router. Set communication paths manually for such modules.

When the networks consist of MELSEC iQ-R series and other series

Setting communication paths allows communications with the following networks configured with modules other than MELSEC iQ-R series.

- Ethernet
- CC-Link IE Controller Network
- CC-Link IE Field Network
- MELSECNET/H
- MELSECNET/10

■Setting method

Set communication paths in "Routing Setting" of "CPU Parameter". (📖 MELSEC iQ-R CPU Module User's Manual (Application))

2 EXERCISE ITEMS, PARAMETER TYPES, AND SETTING AND PROCEDURE BEFORE OPERATION

2.1 Exercise Items

The following table lists the description of exercises.

Item		Check item
Exercise I (Cyclic transmission)	Parameter setting	Check if data link can be performed after setting parameters with peripheral.
	Monitoring and test of peripheral	Check the data link status with monitoring and test of peripheral.
	Direct access	Check if data can be read/written from/to link devices (LB, LW, LX, LY, SB, and SW) of the network module.
Exercise II (Transient transmission)	Link dedicated instruction	Check if transient transmission can be performed with the SEND/RECV instructions.
	Access to other stations	Check if the same functions as those for access to the own station can be used even when other stations are accessed.
Exercise III (Routing function)	Routing parameter	Check if programmable controllers in other networks can be accessed via multiple networks.

2.2 Parameter Types

To operate CC-Link IE Controller Network, set the parameters of the network module with GX Works3.
The following shows each parameter setting window. (The setting details are examples.)

Required settings

Set the station type, network number, and other parameters of the CC-Link IE Controller Network-equipped module.
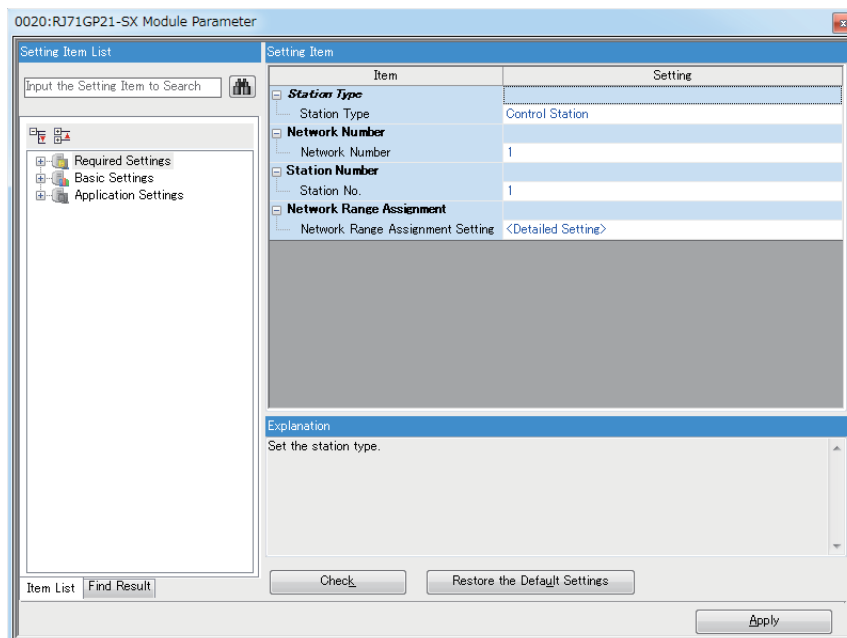
Network range assignment

Set parameters of the normal stations (the number of points and assignment of link devices) to the control staion. The network range assignment is required only for the control station. Parameter data is sent from the control station to the normal stations when the network starts up.
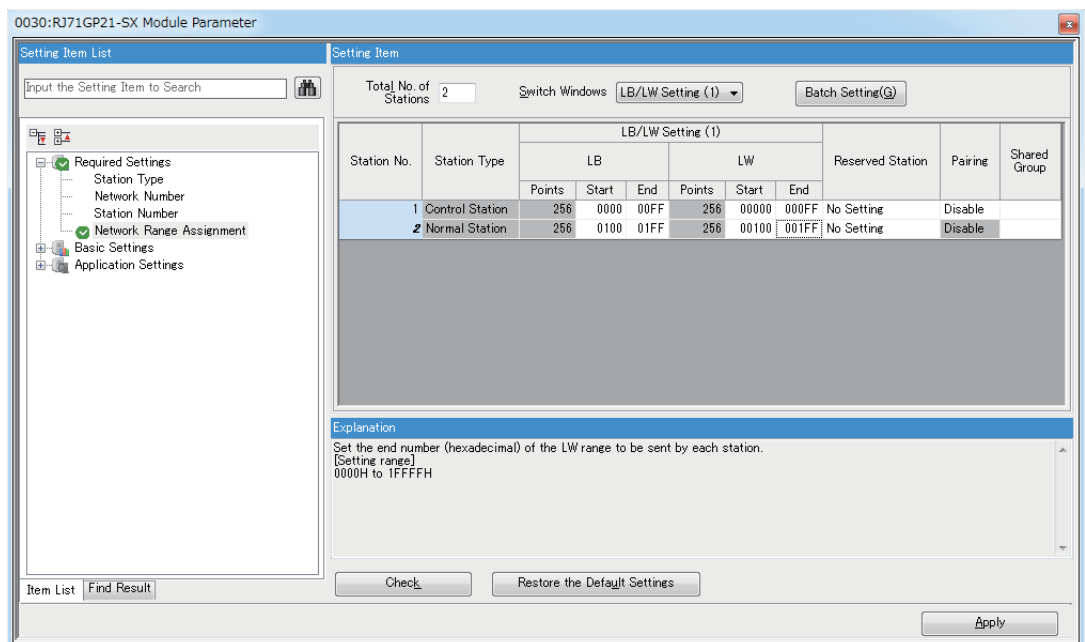
Refresh settings

To use the link devices (LB, LW, LX, and LY) of the network module in sequence programs, set the range to be transferred to the devices (X, Y, M, L, T, B, C, ST, D, W, R, and ZR) of the CPU module.
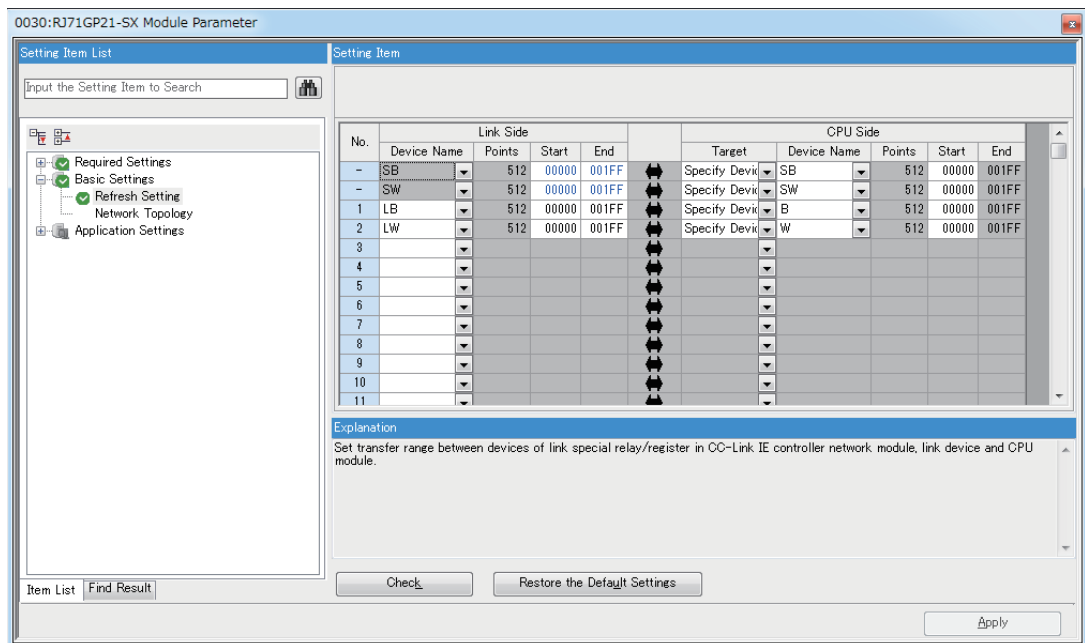
Interlink transmission settings

Set this item to batch-transfer the link data to different networks using parameters when multiple networks are connected to a programmable controller.

Routing settings

Set the route of transient transmission to a station of another network number in a multi-network system.

Interrupt settings

Interrupt conditions are checked when data is received from other stations. Set interrupt conditions so that the network module sends the interrupt request from the CPU module and the interrupt sequence program of the CPU module on the own station starts when the interrupt conditions are satisfied.

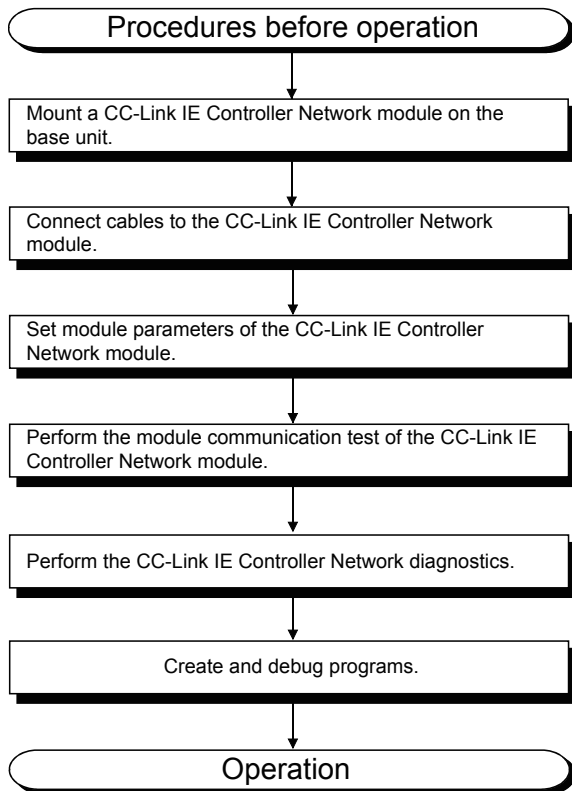| No.	Device/Reception Channel	Device No./Channel No.	Detection Method	Condition Type	Condition Value	Interrupt Pointer	Comment
SI 00	LB	00000	Edge	ON		I50	
SI 01	LX	00100	Level	OFF		I51	
SI 02	SB	00147	Level	ON		I52	
SI 03	LW	00200	Edge	Values Match	500	I53	
SI 04	LW	00074	Edge	Values Mismatch	0	I54	
SI 05	Reception Chann	3	Edge	Reception Com		I55	
SI 06							
SI 07							
SI 08							
SI 09							
SI 10							
SI 11							
SI 12							

Explanation

Select the link device type or choose "Reception channel". If "Reception channel" is selected, interrupt program is executed when the data is received in the channel specified in "Device No./Channel No.".

2.3 Setting and Procedure Before Operation

This section describes the brief procedure before operation.

```
╭──────────────────────────────────╮
│      Procedures before operation  │
╰──────────────────────────────────╯
                 │
                 ▼
┌──────────────────────────────────────┐
│ Mount a CC-Link IE Controller Network │
│ module on the base unit.              │
└──────────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────────┐
│ Connect cables to the CC-Link IE      │
│ Controller Network module.            │
└──────────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────────┐
│ Set module parameters of the CC-Link  │
│ IE Controller Network module.         │
└──────────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────────┐
│ Perform the module communication test │
│ of the CC-Link IE Controller Network  │
│ module.                               │
└──────────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────────┐
│ Perform the CC-Link IE Controller     │
│ Network diagnostics.                  │
└──────────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────────┐
│ Create and debug programs.            │
└──────────────────────────────────────┘
                 │
                 ▼
╭──────────────────────────────────╮
│            Operation              │
╰──────────────────────────────────╯
```

MEMO

3   EXERCISE I (CYCLIC TRANSMISSION)

3.1   System Configuration

This section describes the exercise I (chapter 3) with the following system configuration.

Write parameters and sequence programs to each station and check the operation.

The exercise II (chapter 4) uses the same system configuration.

Module configuration
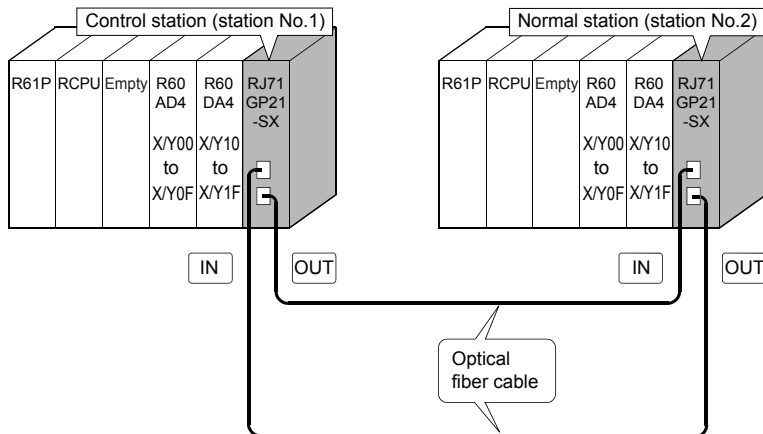
I/O assignment

R61P (Power supply module)	RCPU (CPU No.1)	Empty X/Y0 to F	R60 AD4 (16 points) X/Y10 to 1F	R60 DA4 (16 points) X/Y20 to 2F	RJ71 GP21 -SX (32 points) X/Y30 to 4F

X100 to X10F | Y170 to Y17F

GOT2000

Initial indication device D0
Initial indication device D1
Initial indication device D10 (32 bits)

Initial input device D20
Initial input device D21
Initial input device D30 (32 bits)

Screen 1

Screen 2

Screen 3

Screen 4

Upper section: The indication device can be changed.
Lower section: Data is displayed.

Upper section: The input device can be changed.
Lower section: The input data can be set and displayed.

- Touching [⟳] switches the screen.
- The initial value is automatically set to a device number in the upper section (trigger action function).
- Touching the "Initialize Input/Indication Device" button also initializes the device number.

3.2 Names and Settings of Parts of the CC-Link IE Controller Network Module (RJ71GP21-SX)

This section describes the names of each part of the RJ71GP21-SX.

No.	Name	Description
(1)	RUN LED	Indicates the operating status. On: Normal operation Off: Error (📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application))
	ERR LED[*1]	Indicates the error status of the module. On, flashing: Error (📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application)) Off: Normal operation
	PRM LED[*1]	Indicates the operating status. On: Operating as a control station Off: Operating as a normal station
	D LINK LED[*1]	Indicates the data link status. On: Data link (cyclic transmission being performed) Flashing: Data link (cyclic transmission stopped) Off: Data link not performed (disconnection)
	SD/RD LED	Indicates the data sending/receiving status. On: Data being sent or received Off: Data not sent nor received
	L ERR LED[*1]	Indicates the line error status. On: The following errors have occurred in the line connected to the own station port. • A receive data is faulty (receive frame error).[*2] • Loopback is performed in the own station. • Cable disconnection • Cable insertion error Off: The module or line is in the following status. • A received data is normal (receive frame normal). • Loopback is not performed in the own station.
(2)	Dot matrix LED	Displays the station number set in the module and the module communication test result. Station number not set: "— — —" Control station, normal station: 1 to 120 In offline mode: "···" For display of the module communication test result, refer to the following. (📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application))
(3)	Optical connector (IN connector)	A connector to connect the optical fiber cable. Connect to the OUT connector of another station.
(4)	Optical connector (OUT connector)	A connector to connect the optical fiber cable. Connect to the IN connector of another station.
(5)	Production information marking	Shows the production information (16 digits) of the module.

*1 The LED is always off in offline mode.
*2 When once a receive frame error is detected, the L ERR LED remains on ('IN-side error frame detection of own station' (SB006E)) or 'OUT-side error frame detection of own station' (SB006F) also remains on.).
To turn off the L ERR LED, perform troubleshooting for when the L ERR LED turns on. (📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application))
After taking the action, turn on 'Clear IN-side transmission error count' (SB0007) or 'Clear OUT-side transmission error count' (SB0008).

3.3 Module Communication Test (in offline) with the CC-Link IE Controller Network Module (RJ71GP21-SX)

The module communication test checks the hardware of the CC-Link IE Controller Network-equipped module. When the communications using the CC-Link IE Controller Network-equipped module are unstable, whether a hardware failure has occurred or not can be checked.

The following table lists the tests performed.

Test item	Description
Internal self-loopback test	Checks whether the communication function of the module can be performed normally.
External self-loopback test	Checks whether the communications can be performed normally with the cable connected between two connectors.

The creation of the module configuration is described on Page 3 - 6 Starting GX Works3 or later. Therefore, detailed explanations are omitted here.

■Procedure

1. Select program elements (objects) from the "Element Selection" window and arrange them in the "Module Configuration" window.

🖰 Double-click [Module Configuration] in the "Navigation" window.

2. Set "Module Communication Test" in the following item.

🖰 [Navigation] window ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application Settings] ⇨ [Module Operation Mode]

3. Connect the IN connector and OUT connector with an optical fiber cable.

4. Write the module parameters to the CPU module.

5. Reset or power off and on the CPU module to start the module communication test.

> *Point*
>
> • Do not perform the module communication test while the module has been connected to another station. The operation of another station may fail.

■Checking the status and result of the module communication test

The test status and result can be checked with the LED indicator of the module.

Test status	LED indicator
Test in progress	The dot matrix LED indicates "UCT".
Completed successfully	The dot matrix LED indicates "OK".
Completed with an error	The ERR LED turns on and the dot matrix LED indicates "ERR" and error number alternately at intervals of one second.

• When the test has been completed with an error, the dot matrix LED indicates an error number as shown below.

Error No.	Error detection connector	Description	Action
1_1	IN connector	Internal self-loopback test error	Please consult your local Mitsubishi representative.
2_1	OUT connector		
1_2	IN connector	External self-loopback test connection error	Check the connection of optical fiber cables or replace the cables, and perform the test again. If the test fails again, please consult your local Mitsubishi representative.
2_2	OUT connector		
1_3	IN connector	External self-loopback test communication error	Replace the optical fiber cables and perform the test again. If the test fails again, please consult your local Mitsubishi representative.
2_3	OUT connector		

3.4 Cable Connection

Wiring methods

The following describes connection and disconnection of the optical fiber cable.

■Connecting the cable

1. Push the optical fiber cable connector into the RJ71GP21-SX until it clicks. Pay attention to the connector's direction.

2. Lightly pull it to check that it is securely connected.

■Disconnecting the cable

1. Press the connector hook down and unplug the optical fiber cable.

■Precautions

- The RJ71GP21-SX has an IN connector and OUT connector. Connect the IN connector of own station to the OUT connector of another station and the OUT connector of own station to the IN connector of another station.
- The cable bending radius of the optical fiber cable is limited. For details, check the specifications of the cable used.
- Place the optical fiber cable in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- When handling an optical fiber cable, do not touch the optical fiber core of the cable-side or module-side connector, and protect it from dirt or dust. If oil from your hand, dirt, or dust is attached to the core, it can increase transmission loss, arising a problem in data link.
- Hold the connector part when connecting or disconnecting the optical fiber cable. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.

Wiring products

The following describes the devices used for CC-Link IE Controller Network (when optical fiber cables are used).

■Optical fiber cable

Use optical fiber cables that meet the following standards.

Optical fiber cable	Connector	Type
Optical fiber cable (multimode optical fiber (GI))	Duplex LC connector	Use cables that meet the following standards. • IEEE802.3 (1000BASE-SX) • IEC 60793-2-10 Types A1a.1

Optical fiber cables with connectors are available from Mitsubishi Electric System & Service Co., Ltd. (Catalogs of the optical fiber cables are also available.)

In addition, on-site connector polishing, terminal assembly, and fusion splicing are available. Please consult your local Mitsubishi representative.

Type	Model (Manufacturer)
Multimode fiber (GI)	QG series (Mitsubishi Electric System & Service Co., Ltd.)

3.5 Starting GX Works3

Start GX Works3 to set parameters.
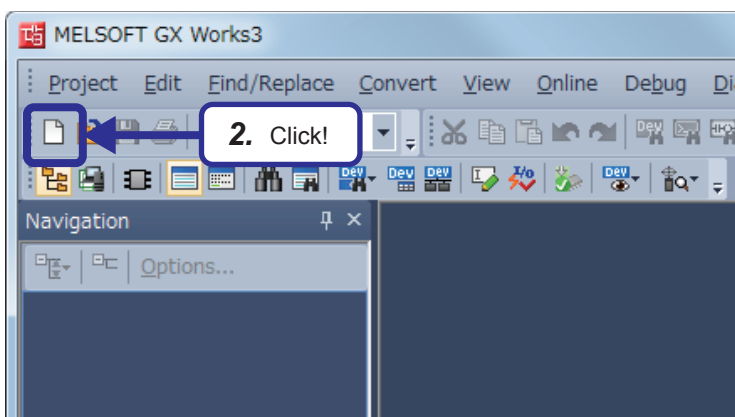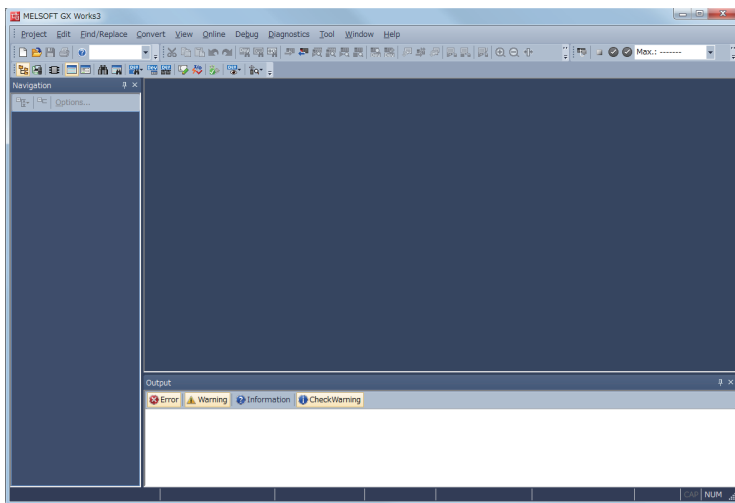
Operating procedure

1. Click [MELSOFT] ⇨ [GX Works3] ⇨ [GX Works3] from the Windows® Start menu*1.

*1 Select [Start] ⇨ [All apps] or [Start] ⇨ [All Programs].

2. Click ☐ on the toolbar or select [Project] ⇨ [New] (Ctrl + N) from the menu.

(To the next page)

(From the previous page)

3. Click!

New

Series	RCPU ▾
	RCPU
Type	FX5CPU
	QCPU (Q Mode)
	LCPU
Mode	F
	4. Click and select!
Program Language	Ladder ▾

OK Cancel
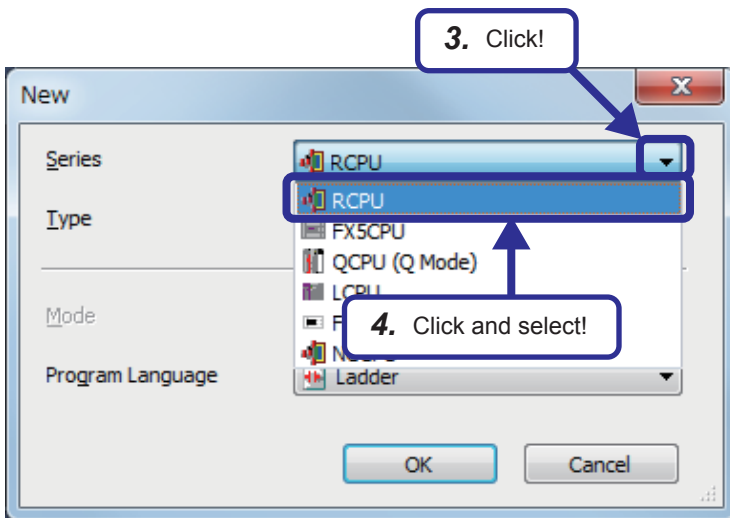
3. Click the list button of "Series".

4. Select "RCPU" from the drop-down menu.

3

5. Click!

New

Series	RCPU ▾
Type	R08 ▾
	R04
	R04EN
	R08
Mode	R08EN
	R08P
	R
Program Language	R
	6. Click and select!
	R16EN
	R16P
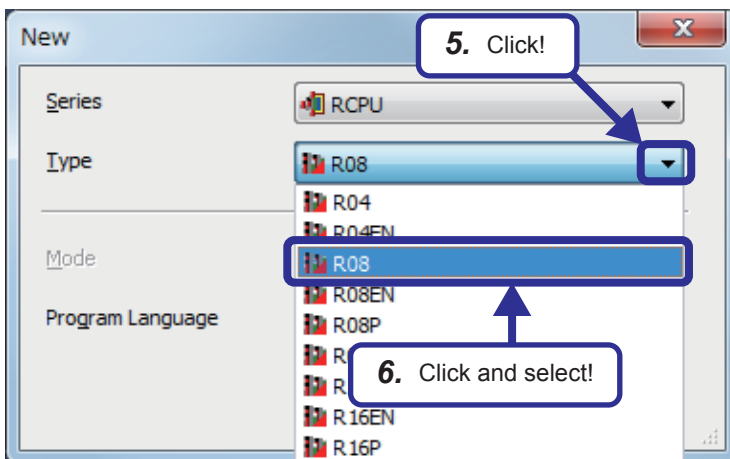
5. Click the list button of "Type".

6. Select "R08" from the drop-down menu.

(To the next page)
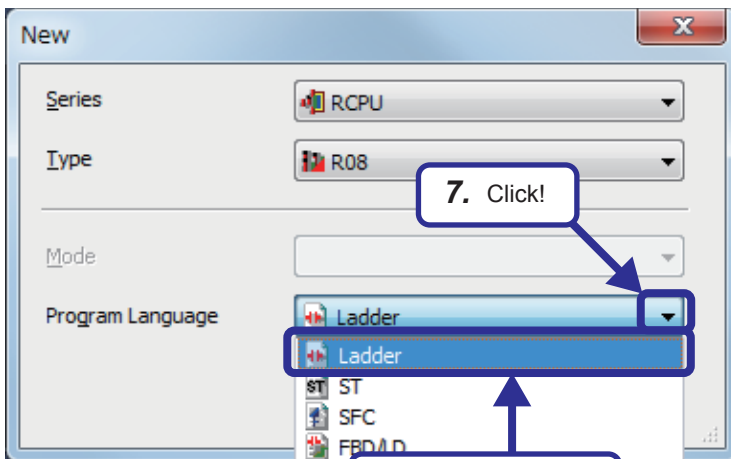
7. Click the list button of "Program Language".

7. Click!

8. Click and select!

8. Select "Ladder" from the drop-down menu.
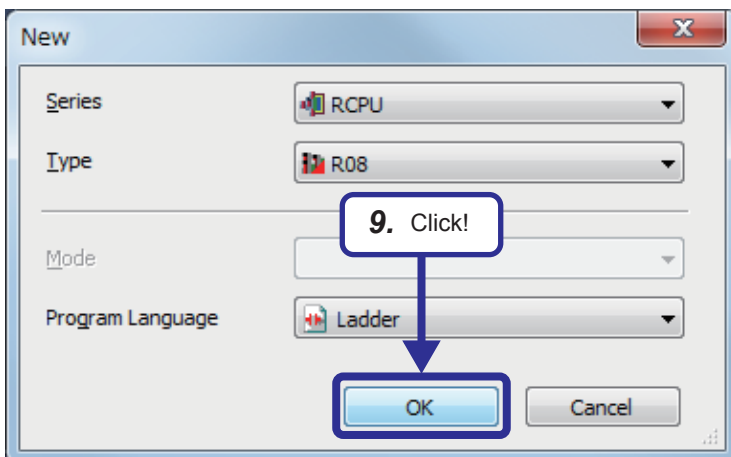
9. Click the [OK] button.
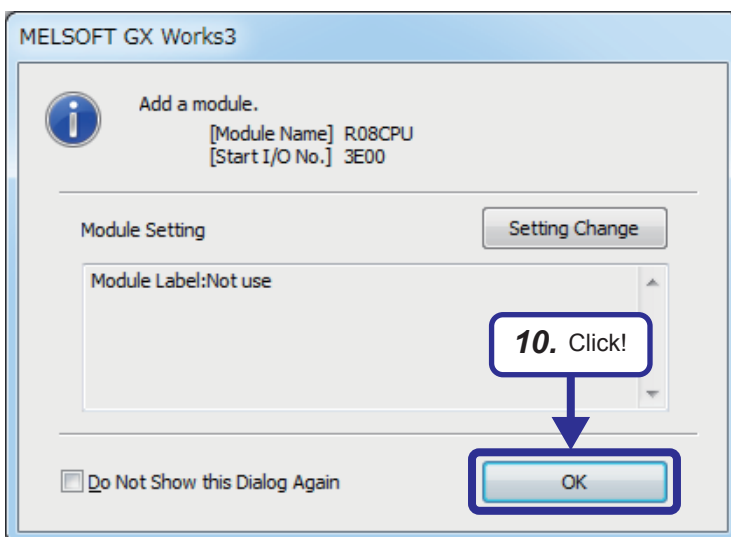
9. Click!

10. Click the [OK] button.

10. Click!

3.6　Setting Parameters

To operate the CC-Link IE Controller Network module, set the parameters of the network module with GX Works3.

Differences of the parameter setting items for each station type

○: Can be set, ×: Cannot be set

Item		Description	Availability	
			Control station	**Normal station**
Required Settings	Station Type	Set the station type of the CC-Link IE Controller Network-equipped module.	○	○
	Network Number	Set the network number of the CC-Link IE Controller Network-equipped module.	○	○
	Station Number	Set the station number of the CC-Link IE Controller Network-equipped module.	○	○
	Network Range Assignment	Set parameters of each station (the number of points and assignment of link devices) in the control station.	○	×
Basic Settings	Refresh Setting	Set the link refresh ranges between the link devices (LB, LW, LX, LY, SB, SW) of the CC-Link IE Controller Network-equipped module and the devices of the CPU module or between the link devices (SB, SW) of the CC-Link IE Controller Network-equipped module and the module labels of the CPU module.	○	○
	Network Topology	Select the topology type according to the actual network configuration.	○	×
Application Settings	Supplementary Cyclic Settings	Set the data link monitoring time, constant link scan time, station-based block data assurance, and transient transmission settings.	○	×
	Interrupt Settings	Set conditions for sending an interrupt request to the CPU module.	○	○
	Transient Transmission Group No.	Set the transient transmission group number.	○	○
	Dynamic Routing	Select whether to enable the dynamic routing function.	○	○
	IP Address	Set the IP address of the control station to communicate with an Ethernet device over CC-Link IE Controller Network.	○	×
	Parameter Name	Set names for the module parameters if desired.	○	○

Send range of each station (LB/LW settings)

Set the send range of each station up to 256 points as shown below.
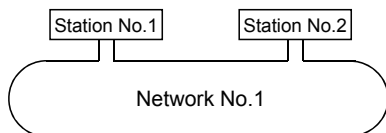
Each station send range parameter
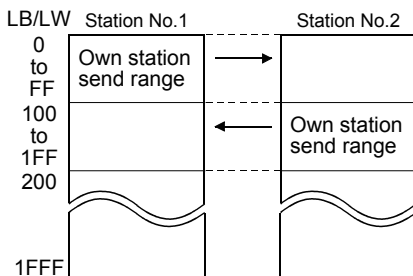
3.6.1 Setting parameters with GX Works3

Adding CC-Link IE Controller Network-equipped module data

Adding a CC-Link IE Controller Network-equipped module in the module configuration enables users to set parameters of the CC-Link IE Controller Network-equipped module.

Operating procedure
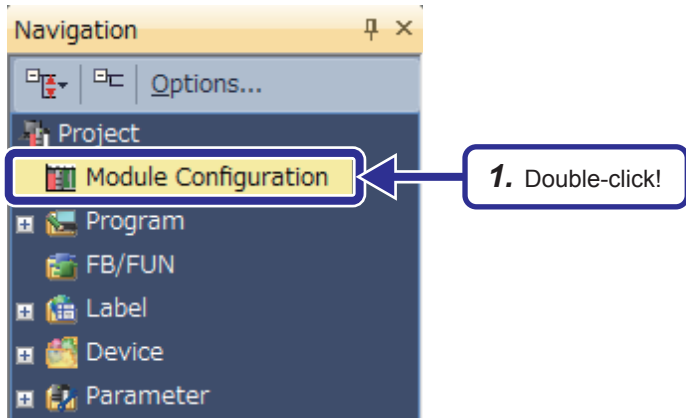
1. Double-click [Module Configuration] in the "Navigation" window.
When the dialog box about parameter information appears, click the [OK] button.

1. Double-click!
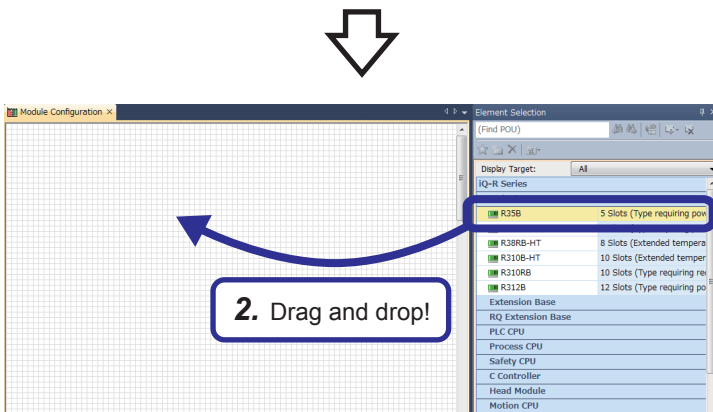
2. The "Module Configuration" window appears. Select "R35B" from "Main Base" in the "Element Selection" window, and drag and drop it to the "Module Configuration" window.
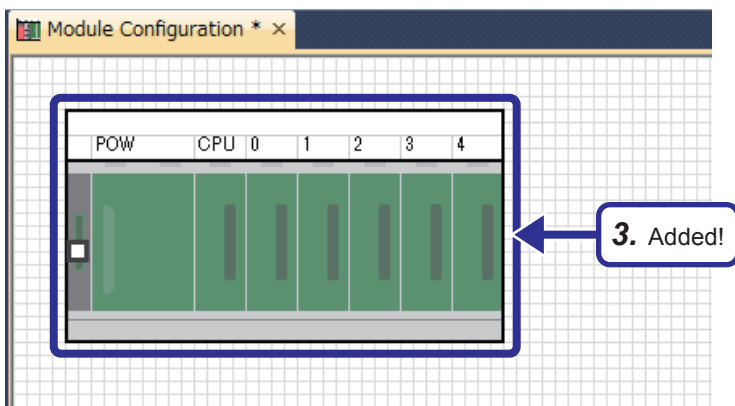
2. Drag and drop!

3. "R35B" is added on the "Module Configuration" window.

3. Added!

(To the next page)
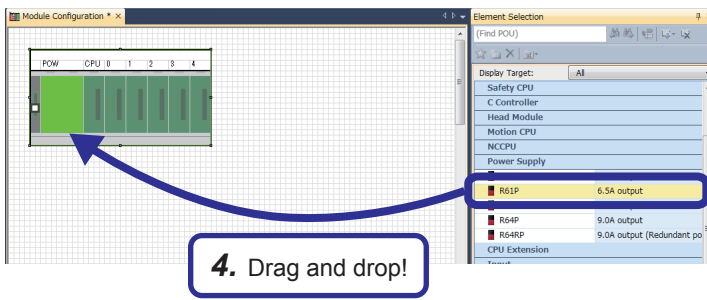
4. Drag and drop!

4. Select "R61P" from "Power Supply" in the "Element Selection" window, and drag and drop it to the power supply slot of the R35B on the "Module Configuration" window.
While the power supply module is being dragged and dropped, the area where the power supply module can be arranged is highlighted.

3

5. Drag and drop!
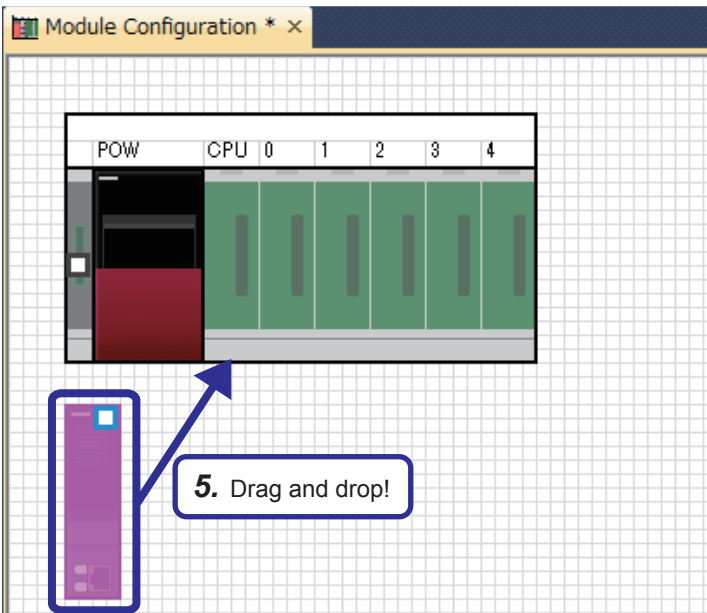
5. Add the R08CPU that has already been arranged in the module configuration to the CPU slot of the R35B.
When the R08CPU has not been arranged in the module configuration, add the R08CPU from the "Element Selection" window in the same way as for the power supply module.

6. Added!
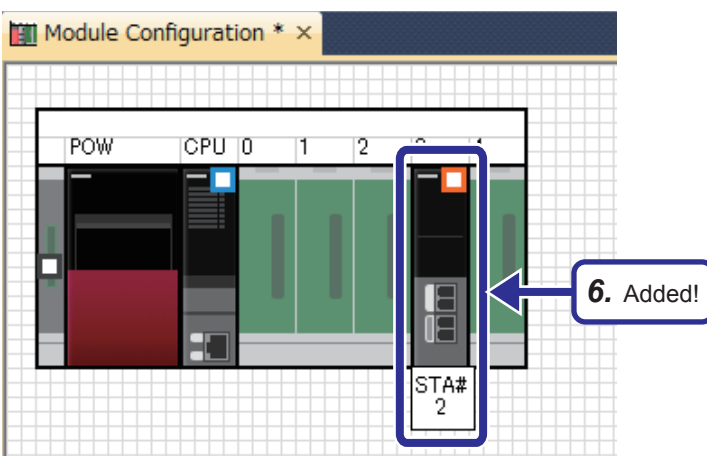
6. Add "RJ71GP21-SX" from "Network Module" in the "Element Selection" window to the slot No.3 of the R35B.
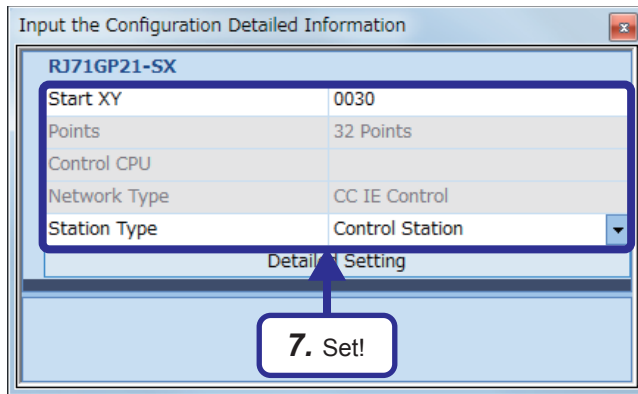
7. Right-click the RJ71GP21-SX, and click [Parameter] → [Input Detailed Configuration Information Window] from the menu to display the "Input the Configuration Detailed Information" window. Set parameters as follows.

[Parameters to be set]
Start XY: 0030
Station Type: Control Station
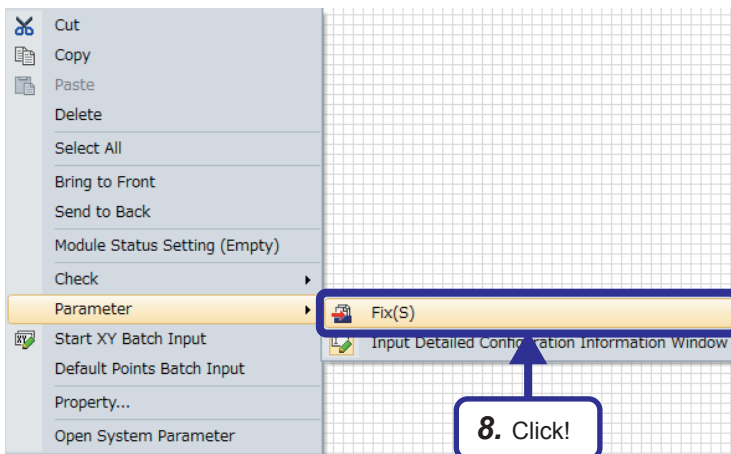
8. After the settings, right-click the RJ71GP21-SX and click [Parameter] → [Fix] from the menu to fix the parameters.
(Click the [No] button on the confirmation window for adding the module label.)
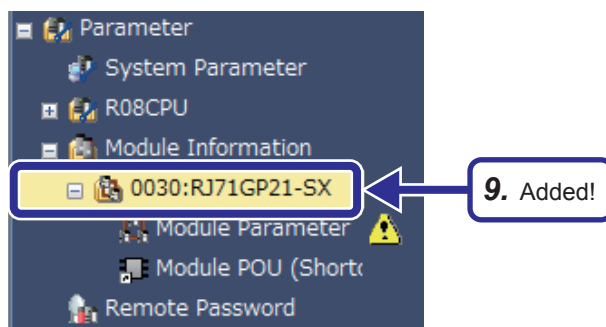
9. The specified data of the CC-Link IE Controller Network-equipped module is added to the "Navigation" window.

Parameter settings (control station)

Set parameters of the control station.

Operating procedure
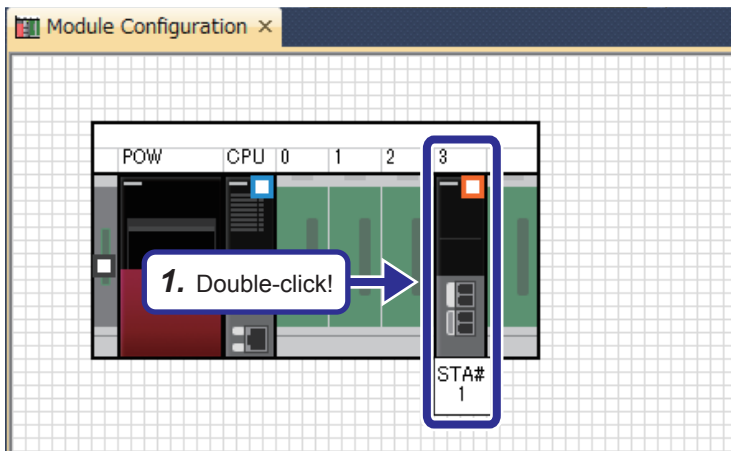
1. Double-click the RJ71GP21-SX in the module configuration.
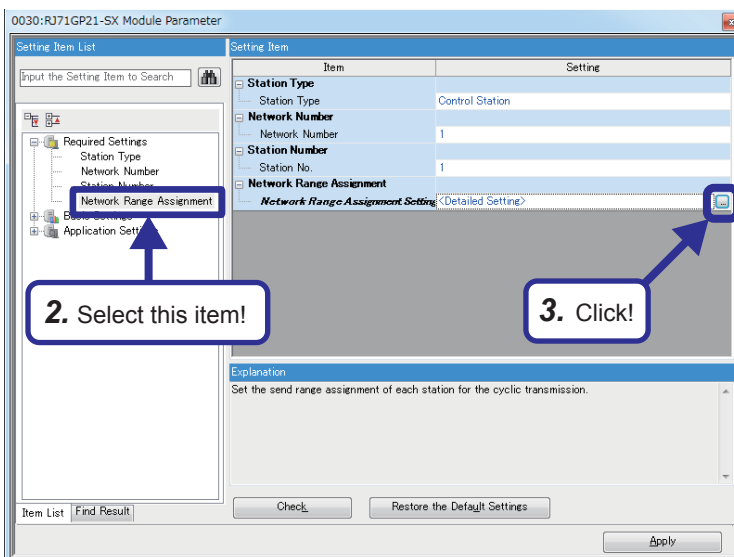
2. Select "Network Range Assignment" of "Required Settings" in "Setting Item List".

3. Click the ▣ button of "Detailed Setting" of "Network Range Assignment Setting" in "Item".

(To the next page)

(From the previous page)
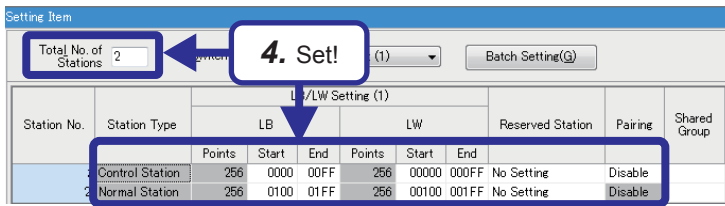
4. Set the network range assignment as shown on the left.

4. Set!

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station	256	0000	00FF	256	00000	000FF	No Setting	Disable	
2	Normal Station	256	0100	01FF	256	00100	001FF	No Setting	Disable	

Total No. of Stations 2   Batch Setting(G)
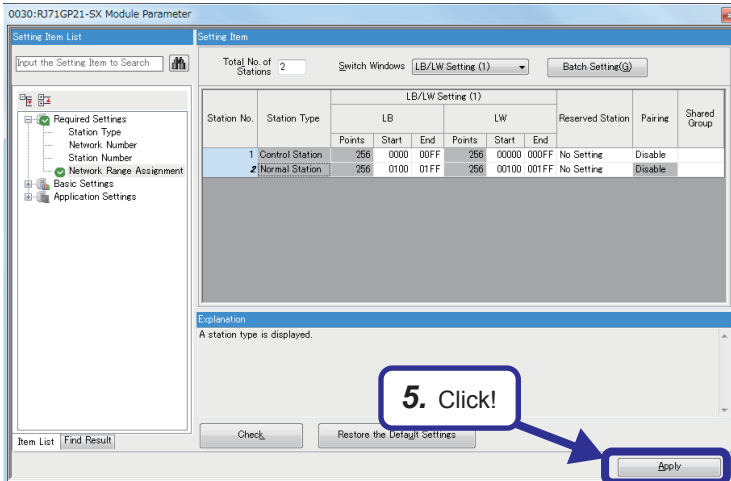
5. Click the [Apply] button.
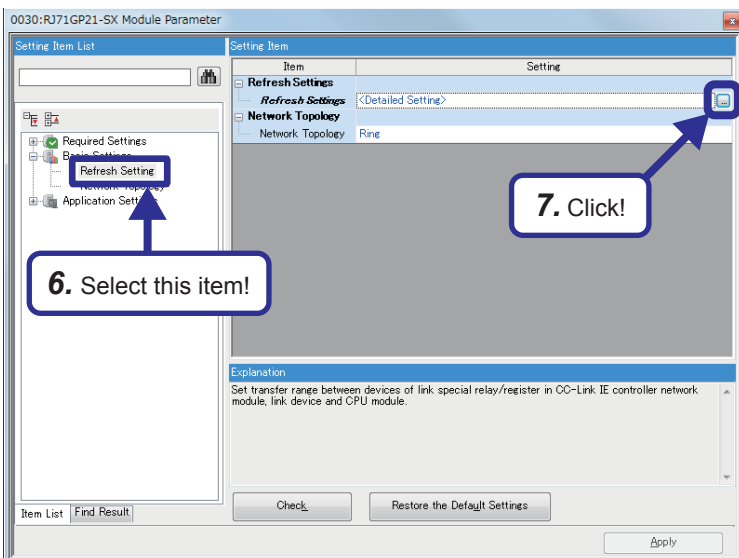
5. Click!

6. Select "Refresh Setting" of "Basic Settings" in "Setting Item List".

7. Click the button of "Detailed Setting" of "Link Refresh Settings" in "Item".

7. Click!

6. Select this item!

(To the next page)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF
-	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF
1	LB	512	00000	001FF	⬌	Specify Device	B	512	00000	001FF
2	LW	512	00000	001FF	⬌	Specify Device	W	512	00000	001FF
3										

8. Set!

8. Set link devices and ranges as shown on the left.

0030:RJ71GP21-SX Module Parameter

Setting Item List

Setting Item

- Required Settings
- Basic Settings
  - ✓ Refresh Setting
  - Network Topology
- Application Settings

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF
-	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF
1	LB	512	00000	001FF	⬌	Specify Device	B	512	00000	001FF
2	LW	512	00000	001FF	⬌	Specify Device	W	512	00000	001FF
3					⬌					
4					⬌					
5					⬌					
6					⬌					
7					⬌					
8					⬌					
9					⬌					
10					⬌					
11					⬌					

Explanation

Set the target CPU device.
[Setting range]
· SB: M, L, B, D, R, ZR, RD, SB
· SW: M, L, B, D, R, ZR, RD, SW
· LB/LW/LX/LY: X, Y, M, L, B, D, W, R, ZR, RD

Item List | Find Result

Check | Restore the Default Settings | Apply

9. Click!

9. Click the [Apply] button to close the "RJ71GP21-SX Module Parameter" dialog box.

10. After setting parameters, save the project with the file name "1Mp1 (cyclic transmission with two modules)".

Parameter settings (normal station)

Set parameters of the normal station.

In a project different from the one in which parameters of the control station have been set, add a CC-Link IE Controller Network-equipped module in the module configuration and set parameters of the normal station.

Operating procedure

1. Added!

1. Create a new project and add a CC-Link IE Controller Network-equipped module by following the procedure described in Page 3 - 10 Adding CC-Link IE Controller Network-equipped module data. After setting the following parameters, fix the parameters. (Click the [No] button on the confirmation window for adding the module label.)

[Parameters to be set]
Start XY: 0030
Station Type: Normal Station

2. Set!

2. Double-click the RJ71GP21-SX on the "Module Configuration" window to open the "RJ71GP21-SX Module Parameter" dialog box. Set the refresh settings in the same way as the control station as shown on the left.

3. Click!

3. Click the [Apply] button to close the "RJ71GP21-SX Module Parameter" dialog box.

4. After setting parameters, save the project with the file name "1Ns2 (cyclic transmission with two modules)".

3.7 Specifying a Connection Destination

Specify a connection destination.

Operating procedure
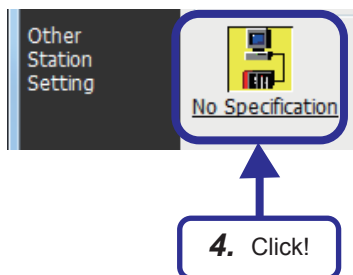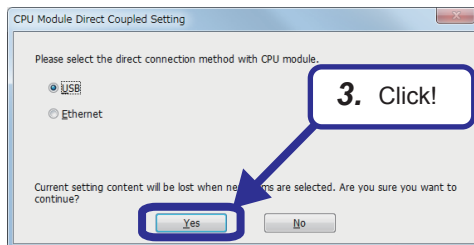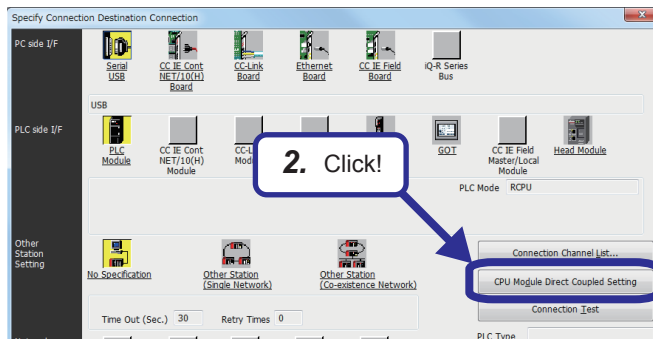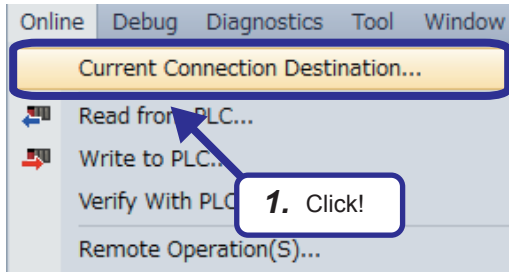
1. Select [Online] ⇨ [Current Connection Destination] from the menu of the engineering tool.

2. Click the [CPU Module Direct Coupled Setting] button on the "Specify Connection Destination Connection" window.

The "CPU Module Direct Coupled Setting" dialog box appears.

3. Select the connection method, and click the [Yes] button.

4. Click "No Specification" of "Other Station Setting".

(To the next page)

(From the previous page)
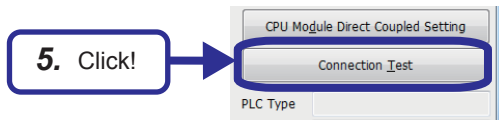
5. Click the [Connection Test] button.

CPU Module Direct Coupled Setting

5. Click! → Connection Test

PLC Type
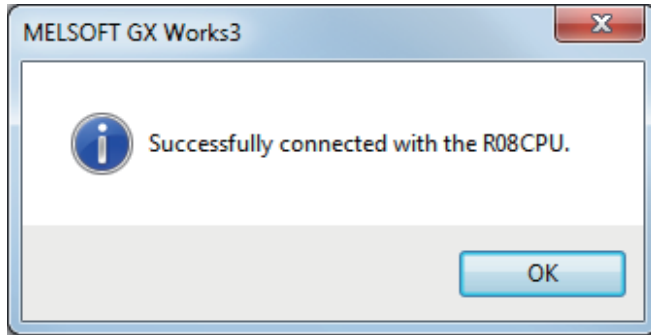
6. Check that the CC-Link IE Controller Network-equipped module is successfully connected with the CPU module.

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Successfully connected with the R08CPU.

OK

7. Click the [OK] button.

Specify Connection Destination Connection

PC side I/F

Serial USB | CC IE Cont NET/10(H) Board | CC-Link Board | Ethernet Board | CC IE Field Board | iQ-R Series Bus

USB

PLC side I/F

PLC Module | CC IE Cont NET/10(H) Module | CC-Link Module | Ethernet Module | C24 | GOT | CC IE Field Master/Local Module | Head Module

PLC Mode RCPU

Other Station Setting

No Specification | Other Station (Single Network) | Other Station (Co-existence Network)

Connection Channel List...

CPU Module Direct Coupled Setting

Connection Test

Time Out (Sec.) 30   Retry Times 0

PLC Type

Details

Network Communication Route

CC IE Cont NET/10(H) | CC IE Field | Ethernet | CC-Link | C24

System Image...

Co-existence Network Route

CC IE Cont NET/10(H) | CC IE Field | Ethernet | CC-Link | C24

Accessing Host Station

7. Click! → OK

Target System

Multiple CPU Setting

1 2 3 4

Target PLC

Not Specified

Cancel

3.8 Writing Parameters

Write the set parameters to the CPU module.

Operating procedure
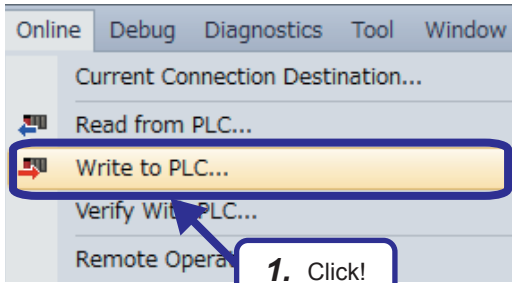
1. Select [Online] ⇨ [Write to PLC] from the menu of the engineering tool.
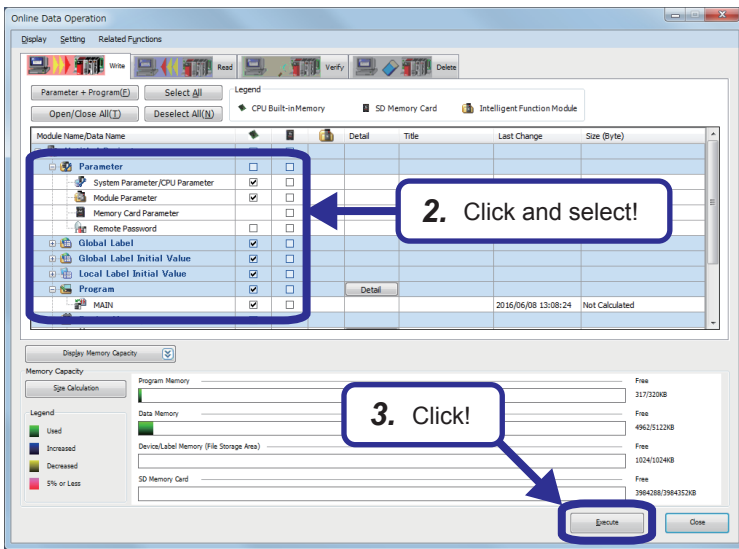
2. The "Online Data Operation" dialog box appears. Select the following items.

- System Parameter/CPU Parameter
- Module Parameter

3. Click the [Execute] button.

(To the next page)

(From the previous page)

⬇

Write to PLC

8/8

100/100%

System Parameter: Writing Completed
CPU Parameter: Writing Completed
Module Parameter: Writing Completed
Global Label Setting File: Writing Completed
Program File(MAIN
Global Label Initial V
Local Label Initial V
Postprocessing Com
Write to PLC : End

4. Click!

☐ When processing ends, close the window automatically.
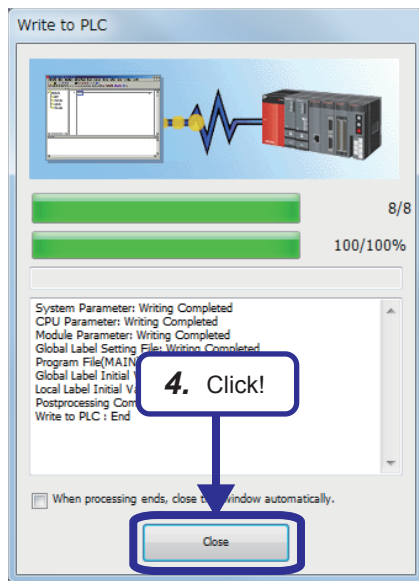
Close

4. The "Write to PLC" dialog box appears.

5. When writing the data is completed, the message "Completed" is displayed. Click the [Close] button.

3.9　Sequence Program

The following shows the sequence program of each station.

3.9.1　Demonstrations of cyclic transmission with two modules

Program for the control station (station No.1)

When X102 of the control station (station No.1) turns on, Y171 of the control station (station No.1) turns on and Y171 of the normal station (station No.2) flashes. When X103 of the control station (station No.1) turns on, D0 of the control station (station No.1) and D0 of the normal station (station No.2) display the measurement value of the timer T0.

Project name	1Mp1 (cyclic transmission with two modules)

		1	2	3	4	5	6	7	8	9	10	11	12
9	(27)	SW0B0.1 —/⊦— Cyclic transmission status of each station	B100 —⊦ ⊦— Link relay of station No.2	SM411 —⊦ ⊦— 0.2 second clock									Y172 —◯— Lamp
10											MOV	W100 Link register of station No.2	D1
11	(35)											MCR	N0
12	(36)												{END }

3 EXERCISE I (CYCLIC TRANSMISSION)

Program for the normal station (station No.2)

When X102 of the normal station (station No.2) turns on, Y172 of the normal station (station No.2) turns on and Y172 of the control station (station No.1) flashes. When X103 of the normal station (station No.2) turns on, D1 of the normal station (station No.2) and D1 of the control station (station No.1) display the measurement value of timer T0.

Project name	1Ns2 (cyclic transmission with two modules)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB20 / Module status	SB47 / Baton pass status of own station	SB49 / Data link status of own station							MC	N0	M0
2		N0 — M0											
3	(5)	SW0B0.1 / Cyclic transmission status of each station	X102 / Switch										B100 / Link relay of station No.2
4													Y172 / Lamp
5			X103 / Switch								OUT	T0 / Timer	K99
6			T0 / Timer								RST	T0 / Timer	
7											MOV	T0 / Timer	W100 / Link register of station No.2
8											MOV	W100 / Link register of station No.2	D1
9	(27)	SW0B0.0 / Cyclic transmission status of each station	B0 / Link relay of station No.1	SM411 / 0.2 second clock									Y171 / Lamp
10											MOV	W0 / Link register of station No.1	D0
11	(35)										MCR	N0	
12	(36)												[END]

3.10 Diagnostic Functions

The diagnostic functions, such as the CC-Link IE Controller Network diagnostics and the system monitor, check the network status and error details and perform an operation test for troubleshooting.

3.10.1 CC-Link IE Controller Network diagnostics with GX Works3 (online test)

Use the network diagnostic functions of GX Works3 to easily check or diagnose the line status.
For details on the operation of each function, refer to the following.
📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application)

Operating procedure
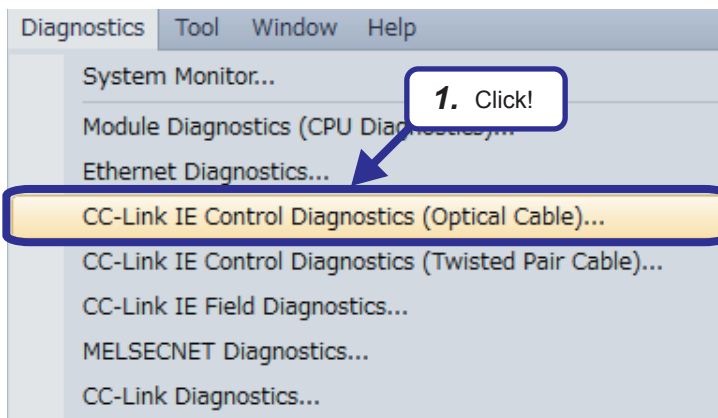
1. Click [Diagnostics] ⇨ [CC-Link IE Control Diagnostics (Optical Cable)].
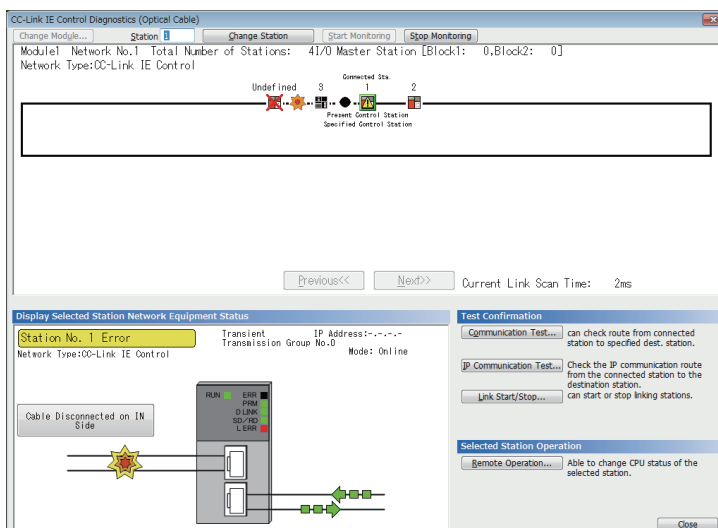
2. The "CC-Link IE Control Diagnostics" dialog box appears.
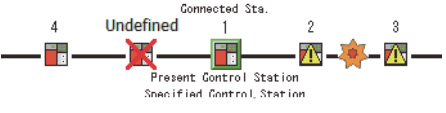
> **Point** 🖉
>
> - If "Other Station" is selected in "Other Station Setting" in the "Specify Connection Destination Connection" window, the CC-Link IE Controller Network diagnostics cannot be started. Directly connect the engineering tool to the station to be diagnosed and start the CC-Link IE Controller Network diagnostics.
> - When multiple CC-Link IE Controller Network-equipped modules with the same network number have been mounted on the same base unit, the module with the smallest start I/O number is always diagnosed, regardless of setting.
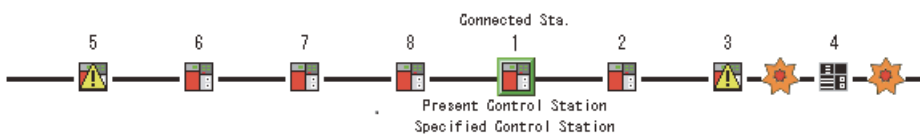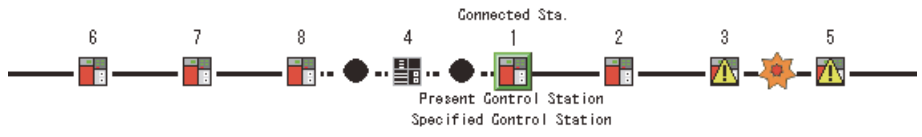
Diagnostic window
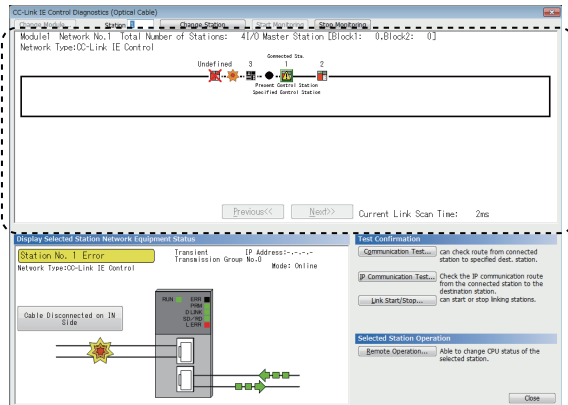
Network information display

Item	Description
[Change Module] button	Changes the CC-Link IE Controller Network-equipped module to be diagnosed when multiple CC-Link IE Controller Network-equipped modules are mounted. However, when multiple CC-Link IE Controller Network-equipped modules with the same network number have been mounted on the same base unit, the module with the smallest start I/O number is always diagnosed, regardless of setting.
Station	Specifies the station number of the station to be diagnosed. A station to be diagnosed can also be selected by clicking the station icon displayed in "Network information display".
[Change Station] button	Enter another station number in "Station" and click this button to change the selected station.
[Start Monitoring] button	Starts monitoring of the CC-Link IE Controller Network diagnostics.
[Stop Monitoring] button	Stops monitoring of the CC-Link IE Controller Network diagnostics.

Item			Description
Network information display	Module□		Displays the module number of the network being diagnosed.
	Network No.		Displays the network number of the network being diagnosed.
	Total Number of Stations		Displays the total number of stations (sum of control stations and normal stations) set in "Network Range Assignment" of "Required Settings".
	I/O Master Station	Block 1:	Displays the station number of the I/O master station of block 1.
		Block 2:	Displays the station number of the I/O master station of block 2.
	Network Type		Displays "CC-Link IE Control Extended Mode" or "CC-Link IE Control".
	Icon		Displays the configuration of CC-Link IE Controller Network and the status of each station. If the status is not displayed, check that there is only one control station in the system and no station number is overlapped.
		Station No.	1 to 120: Displays the station number of the CC-Link IE Controller Network-equipped module. Undefined: Displayed for the station for which parameters have not been set or station No. is not assigned.
		Connected station	Indicates the station (own station) where the engineering tool has been connected.
		Icon	The station icons that may be displayed are listed below.
			Normally operating station
			Faulty station (A fault has occurred on a module and cable while cyclic transmission is performed.)
			Faulty station (Cyclic transmission is stopped.)
			Station in a different shared group (No cyclic data is received.)
			Disconnected station (black)
			Reserved station (gray)
			Selected station (station icon edged with green) • This icon indicates that a station has been selected by clicking a station icon or moving a focus and holding down a space bar. • The station status is displayed in "Display Selected Station Network Equipment Status". • Disconnected stations and reserved stations cannot be selected.
			Focusing (station icon edged with dotted line) • This icon indicates that a station has been focused by holding down a space bar. • Disconnected stations and reserved stations cannot be selected.
			Communication error • If the station adjacent to the one where a communication error has occurred is selected, the station status is displayed at "Display Selected Station Network Equipment Status".
		Current control station	Displayed for the station actually operating as control station.
		Specified control station	Displayed for the station set as the control station by network parameters.

Item		Description
Network information display	Display position of a disconnected station	■When normal connection information has been obtained The disconnected station (station No.4) is displayed in the position where it was connected when normal. ■When normal connection information has not been obtained The disconnected station (station No.4) is displayed on the IN side of the engineering tool connected station.
	[Previous] button	When the total number of stations is 61 or more, the window prior to "Network information display" is displayed by clicking this button.
	[Next] button	When the total number of stations is 61 or more, the window next to "Network information display" is displayed by clicking this button.
	Current Link Scan Time	Displays the link scan time of the displayed network.
Display Selected Station Network Equipment Status		Displays the status of the station selected in "Network information display".
Test Confirmation	[Communication Test] button	Performs a communication test.
	[IP Communication Test] button	Performs an IP communication test.
	[Link Start/Stop] button	Starts or stops cyclic transmission.
Selected Station Operation	[Remote Operation] button	Executes remote operations to the CPU module (such as operating status change and reset).

■Acquisition of normal connection information

The normal connection information is network configuration data that the CC-Link IE Controller Network-equipped module on the engineering tool connected station stores in its memory when all stations are normal.

When all of the following conditions are satisfied, the normal connection information can be obtained. Also, after any of the conditions became unsatisfied, if all of them are satisfied again, the normal connection information will be updated.

- Data link status is all stations normal. ('Data link error status of each station' (SB00B0) is off.)
- There is no loopback station. ('Loopback status' (SB0065) is off.)
- No station has a parameter error. ('Parameter error status of each station' (SB00E0) is off.)
- The number of actually connected stations is the same as the total number of stations that is set for the control station (except for reserved stations).

Point💡
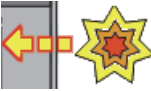
When multiple stations in the same system have the same network number, if a station other than those in the system is selected while a station of the smallest start I/O number has a baton pass error, a transient execution error (no baton passing on the own station) (E504H) will occur.

Correct the baton pass error, and execute transient transmission again.

Display Selected Station Network Equipment Status

The status of the station selected in "Network information display" is displayed.

■When a station where an error has occurred is selected

No.	Description
(1)	Indicates the operating status. • Station No.□: Normal operation • Station No.□ Error (yellow): Error (Data link is continued.) • Station No.□ Error (red): Error (Data link is stopped.)
(2)	Displays the network type.
(3)	Displays the transient transmission group number of the selected station.
(4)	Displays the shared group number of the selected station.
(5)	Displays an IP address (only when it is set).
(6)	Displays a mode.
(7)	Click this button to check error details. Take actions following the description displayed in "Error Factor" and "Troubleshooting".
(8)	Displays the LED status of a module and the communication status of the IN connector and OUT connector. (📖 MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup))
(9)	Communication status • Properly connected • Error (cable disconnection) • Error (other than cable disconnection) • Module error (CC-Link IE Controller Network parameter setting error or transient transmission error)

Point

• When a transient transmission error occurs, check the error description in error code and take actions.

• When multiple stations in the same system have the same network number: If a station other than those in the system is selected while a station of the smallest start I/O number has a baton pass error, a transient execution error (no baton passing on the own station) (E504H) will occur. Correct the baton pass error, and execute transient transmission again.

Remote operation

This function executes remote operations (such as operating status change and reset) to the station selected on the "CC-Link IE Control Diagnostics" window, from the engineering tool.

Operating procedure

Set the CPU module to the RUN state before this operation.

(To the next page)
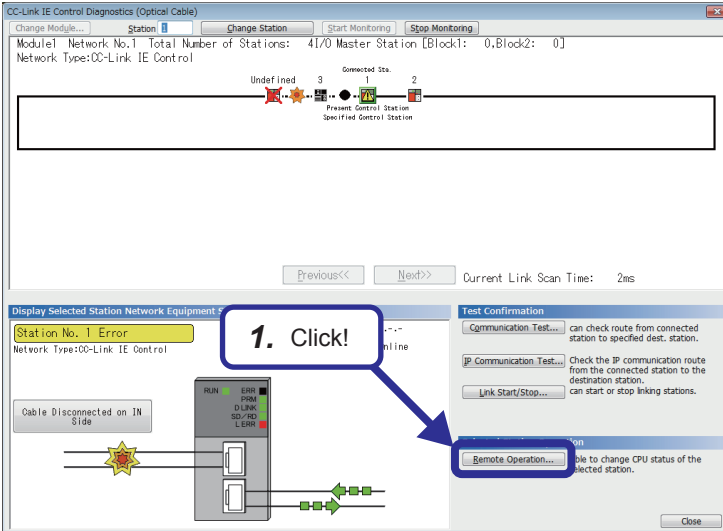
1. Select a remote operation target module in the "CC-Link IE Control Diagnostics" window and click the [Remote Operation] button. The "Remote Operation" dialog box appears.
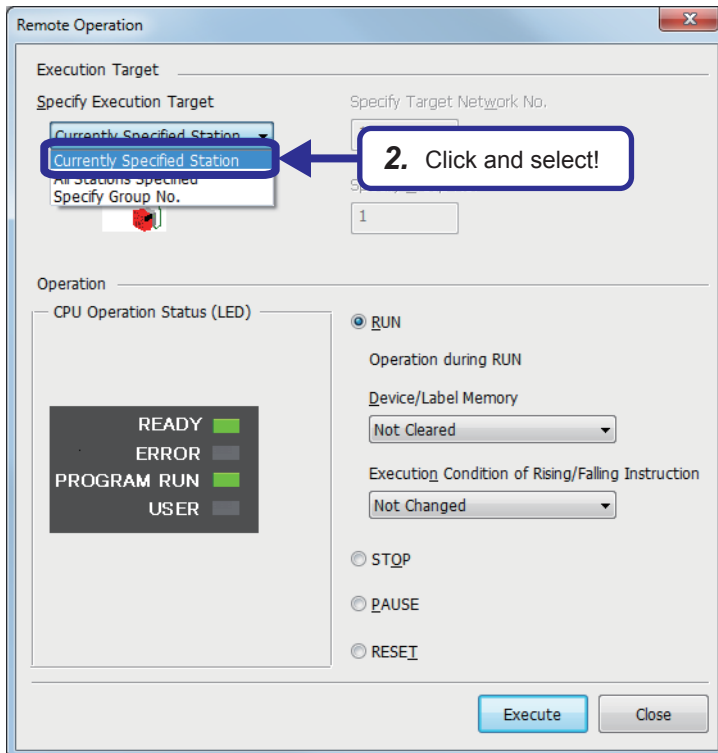
2. Select "Currently Specified Station" in "Specify Execution Target".

"Currently Specified Station": A remote operation is executed only to the CPU module on the station selected in the "CC-Link IE Controller Network Diagnostics" window.

"All Stations Specified": A remote operation is executed on all stations on the network specified by "Specify Execution Target".

"Specify Group No.": A remote operation is executed only on stations with the specified group number on the network specified by "Specify Execution Target".

(From the previous page)

⬇
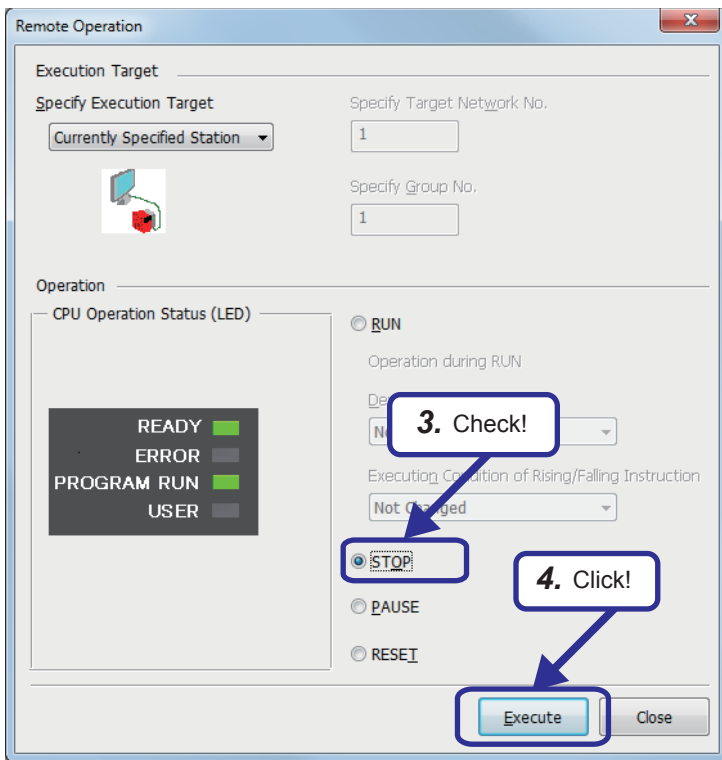
3. Select "STOP" in "Operation".[1]

4. After the setting is completed, click the [Execute] button.

Remote Operation

Execution Target

Specify Execution Target
Currently Specified Station ▾

Specify Target Network No.
1

Specify Group No.
1

Operation

CPU Operation Status (LED)

READY ▮
ERROR ▮
PROGRAM RUN ▮
USER ▮

○ RUN

Operation during RUN

De...
N...

3. Check!

Execution Condition of Rising/Falling Instruction
Not Changed ▾

⦿ STOP

4. Click!

○ PAUSE

○ RESET

Execute   Close

⬇

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⚠ Do you want to execute STOP operation?

Yes   No

5. Click!

5. The message "Do you want to execute STOP operation?" appears. Click the [Yes] button.

⬇

MELSOFT GX Works3

ℹ The STOP operation has been completed.

OK
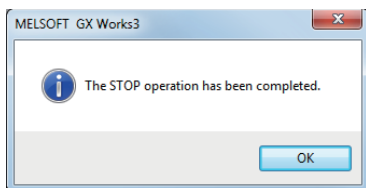
6. The CPU module stops and the green light of the PROGRAM RUN LED of the CPU module in the demonstration machine turns off.

7. Select "RUN" in the dialog box of step 3, and perform the steps 3 to 5 again.
The CPU module that was in the STOP state is set to the RUN state again and the green light of the PROGRAM RUN LED of the CPU module in the demonstration machine turns on.

[1]   To perform remote reset operations, preset "Remote Reset Setting" under "Operation Related Setting" to "Enable" in "CPU Parameters".

3.10.2 System monitor

The system monitor displays the module configuration of the operating system and detailed information of each module. Users can check error status and diagnose the module where an error has occurred.

Diagnostics

Operating procedure
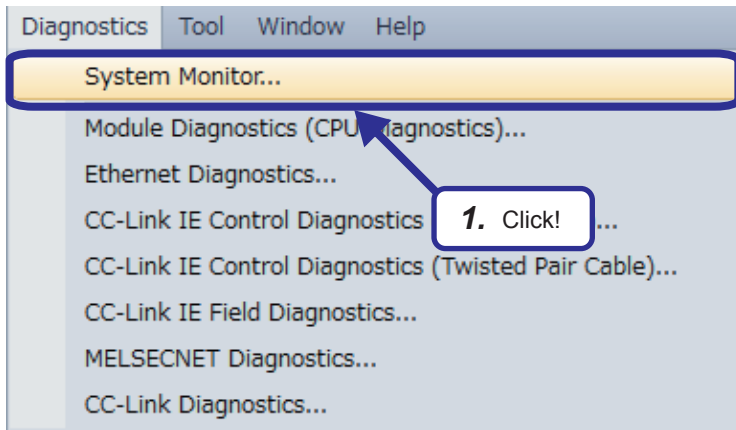
1. Click [Diagnostics] ⇨ [System Monitor].
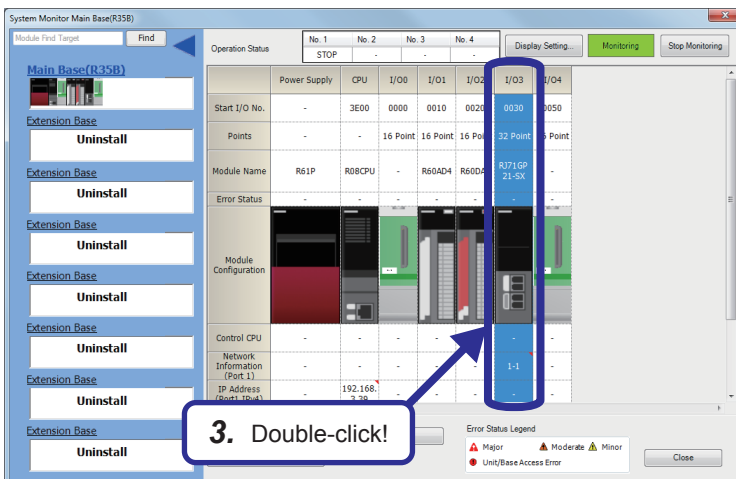
2. The "System Monitor" dialog box appears and it displays the module configuration of the demonstration machine.

3. Double-click the RJ71GP21-SX to display the "Module Diagnostics" dialog box. Check the module status.

Checking the module status

The following items can be checked in the "Module Diagnostics" dialog box.

Item		Description
Error Information		Displays the details of the errors that have occurred. Click the [Event History] button to check the history of errors that have occurred on the network, errors detected for each module, and operations that have been executed.
Module Information List		Displays various status information of the CC-Link IE Controller Network-equipped module.
Supplementary Function	• CC IE Control Diagnostics	Enables checking the cause to resolve the problem when an error occurs in CC-Link IE Controller Network.

■Error Information

Check the details of the error that has occurred and actions to eliminate the error.
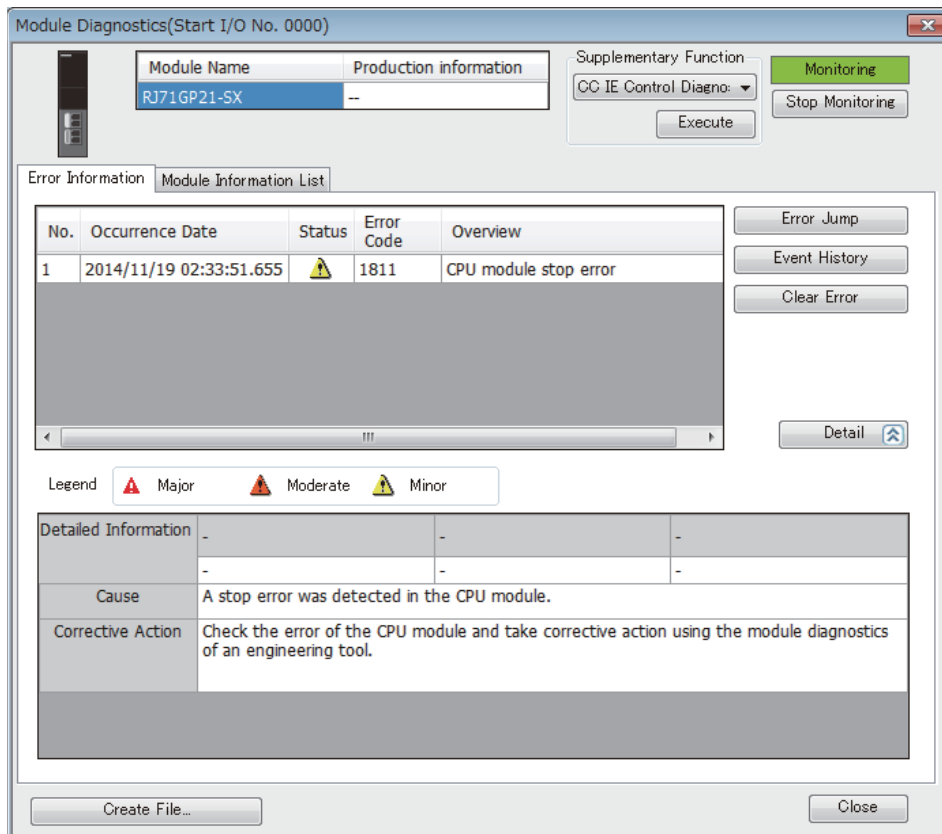
Item	Description
Status	Major: An error such as a hardware failure and memory failure. The module stops operating.
	Moderate: An error, such as a parameter error, which affect module operation. The module stops operating.
	Minor: An error such as a communication failure. The module continues operating.
Detailed Information	Displays detailed information about each error (maximum of 3 pieces).
Cause	Displays the detailed error causes.
Corrective Action	Displays the actions to eliminate the error causes.

■Module Information List

Switch to the [Module Information List] tab to check various status information of the CC-Link IE Controller Network-equipped module.

Module Diagnostics(Start I/O No. 0000)

Module Name	Production information	Supplementary Function	
RJ71GP21-SX	--	CC IE Control Diagnosti▼	Monitoring / Stop Monitoring
		Execute	

[Error Information] [Module Information List]

Item	Content
LED information	
RUN	On: Running
ERR	On: Minor error or major error (when the RUN LED is off)
PRM	On: Running as control station
D LINK	Flashing: Data link(Baton pass communication)Executing
SD/RD	On: Data being sent or received.
L ERR	Off: A Received data is normal, own station is not looping back.
Individual information	
Station Type	Control station
NetworkNo.	2
Station Number	1
Transient transmission groupNo.	No group specification

[Create File...] [Close]

Item		Description
LED information		Displays the LED status of the CC-Link IE Controller Network-equipped module.
Individual information	Station Type	Displays the station type set for the module selected.
	Network No.	Displays the network number set for the module selected.
	Station Number	Displays the station number set for the selected module.
	Transient transmission group No.	Displays the transient transmission group number set for the selected module.

3.11 Directly Accessing Link Devices of the Network Module

This function allows direct access to the link devices of the CC-Link IE Controller Network-equipped module from the program.

Specify a link device (LB, LW, LX, LY, SB, SW) as the link direct device (J□\□) for direct access.

Specification method

Specify the network number and the link device of the CC-Link IE Controller Network-equipped module for reading or writing data.

J□\□
↑ ↑
(1) (2)

(1) Network number: 1 to 239
(2) Link relay (LB): B0 to B7FFF
Link register (LW): W0 to W1FFFF
Link input (LX): X0 to X1FFF
Link output (LY): Y0 to Y1FFF
Link special relay (SB): SB0 to SB1FF
Link special register (SW): SW0 to SW1FF

Ex.
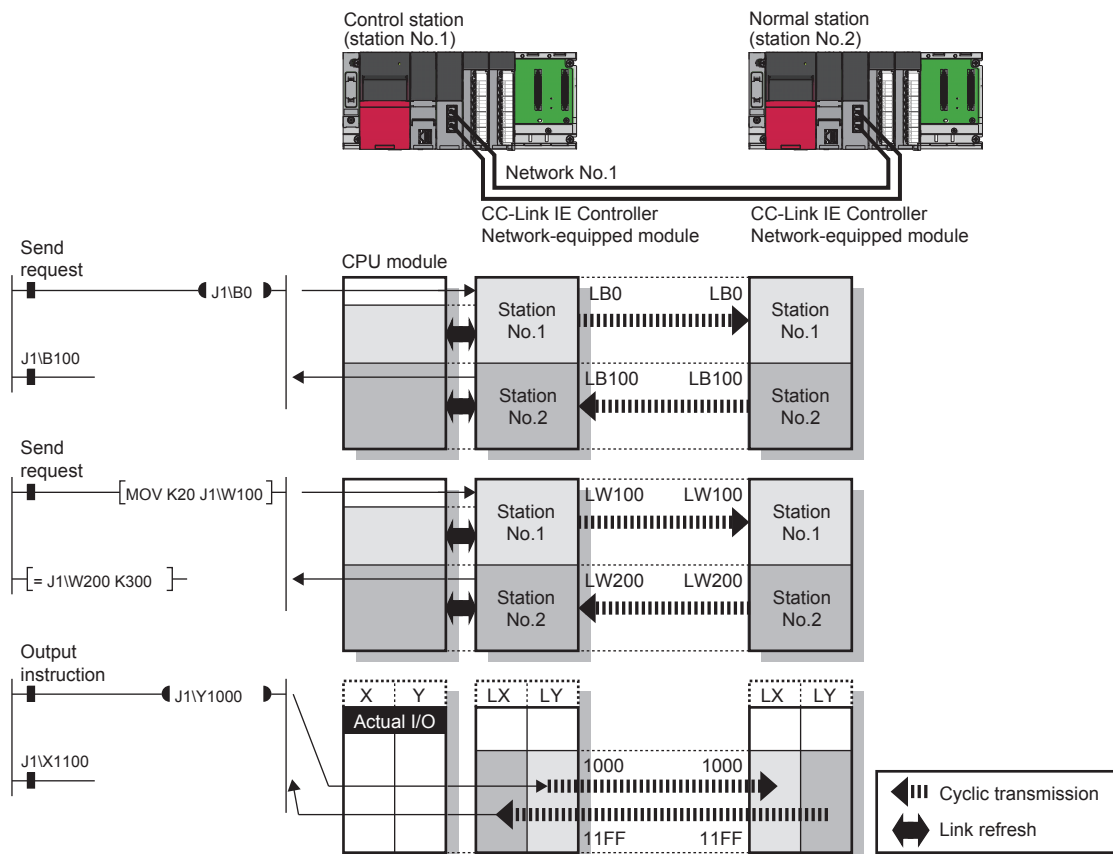
Readable and writable range

Data can be read or written between the CC-Link IE Controller Network-equipped module and CPU module mounted on the same base unit.

■Read

All the link devices of the CC-Link IE Controller Network-equipped module can be specified.

■Write

The range that satisfies all of the following conditions can be specified.
- Area where data is sent to other stations and outside the link refresh range
- Within the link device range of the CC-Link IE Controller Network-equipped module

(1) Out of the link refresh range

(2) Area where data is sent to other stations

(3) Area for receiving the data from other stations
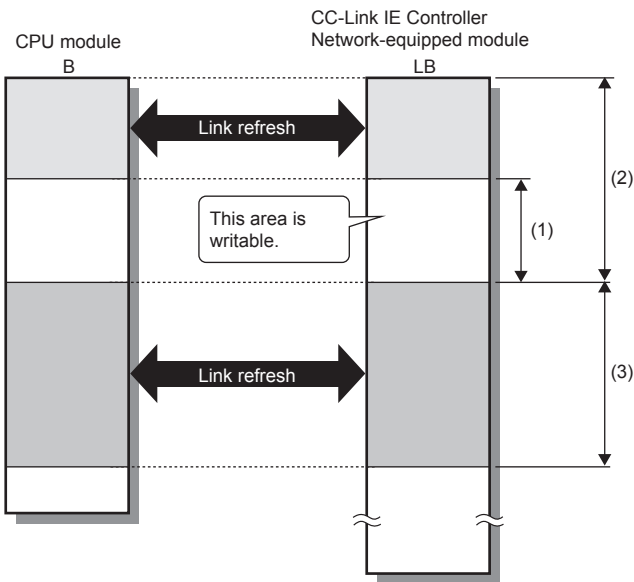
Point

When writing data to the area in the link refresh range, directly access the link device and write the same data in the device of the CPU module.

- Bad example (Only direct access to the link refresh target)

Link refresh overwrites the value.
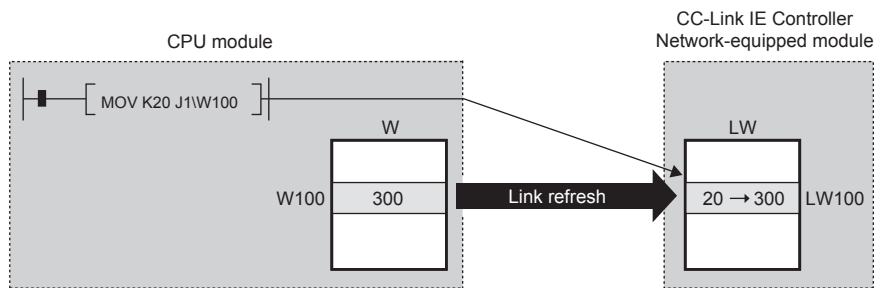
- Good example (In addition to direct access, writing the same data to the device of the CPU module)

The value written by link direct access is reflected.
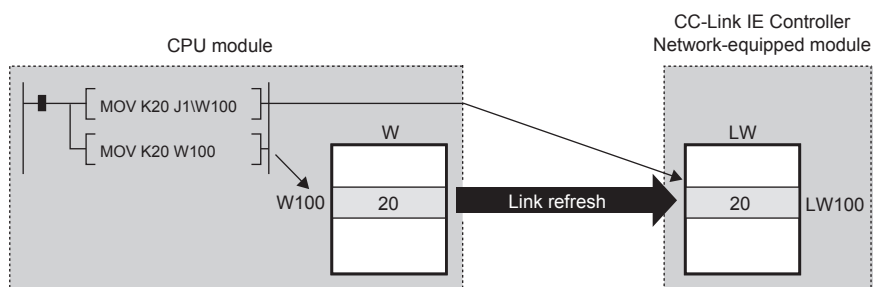
Differences from link refresh

Item	Access method	
	Link refresh	**Direct access**
Number of steps	1	2
Processing speed[*1]	High speed	Low speed
Cyclic data integrity assurance	Supported	Not supported

*1 For actual values, refer to the following.
    📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks)

Shortening the link refresh time and transmission delay time

■Shortening the link refresh time

Remove infrequently used link devices from the link refresh range, and directly read or write the corresponding data using link direct devices. This function reduces the number of the link refresh points to the CPU module, resulting in a shorter link refresh time.

■Shortening the transmission delay time

Because the link direct device allows direct reading or writing of data to the link devices of the CC-Link IE Controller Network-equipped module at execution of the instruction, the transmission delay time can be shortened.

> **Point**
>
> Link refresh is executed in END processing of the sequence scan of the CPU module.

Precautions

■Cyclic data integrity assurance

Direct access to link devices does not provide station-based block data assurance. Use 32-bit data assurance, or if cyclic data of more than 32 bits needs to be assured, use interlock programs.

■Mounting multiple modules with the same network number

When mounting multiple modules with the same network number and using the function that specifies a target CC-Link IE Controller Network-equipped module with a network number, the execution target of such as link direct devices will be as follows.

Item	Description
Link direct device	The target is a module with the smallest slot number on the base unit.
Dedicated instruction	The module with the smallest slot number on the base unit processes dedicated instructions.

3.11.1 Demonstrations of direct access with two modules

Perform demonstrations of the direct access.

Change the parameters and sequence programs created in Page 3 - 21 Demonstrations of cyclic transmission with two modules, write them to the CPU module, and check that the communications are established.

Setting parameters with GX Works3

Set the module parameters as follows.

For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Refresh Setting (common to all stations)

Delete all the values of "Refresh Setting" in the module parameters.

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB				⟷					
–	SW				⟷					
1					⟷					
2					⟷					
3					⟷					

Point

The setting needs to be changed for monitoring because the link direct device is the link memory.

Click [Tool] ⇨ [Options] ⇨ [Monitor] ⇨ [Ladder Editor] from the engineering tool, and set "Monitor Buffer Memory and Link Memory" in "Operation Setting" to "Yes".
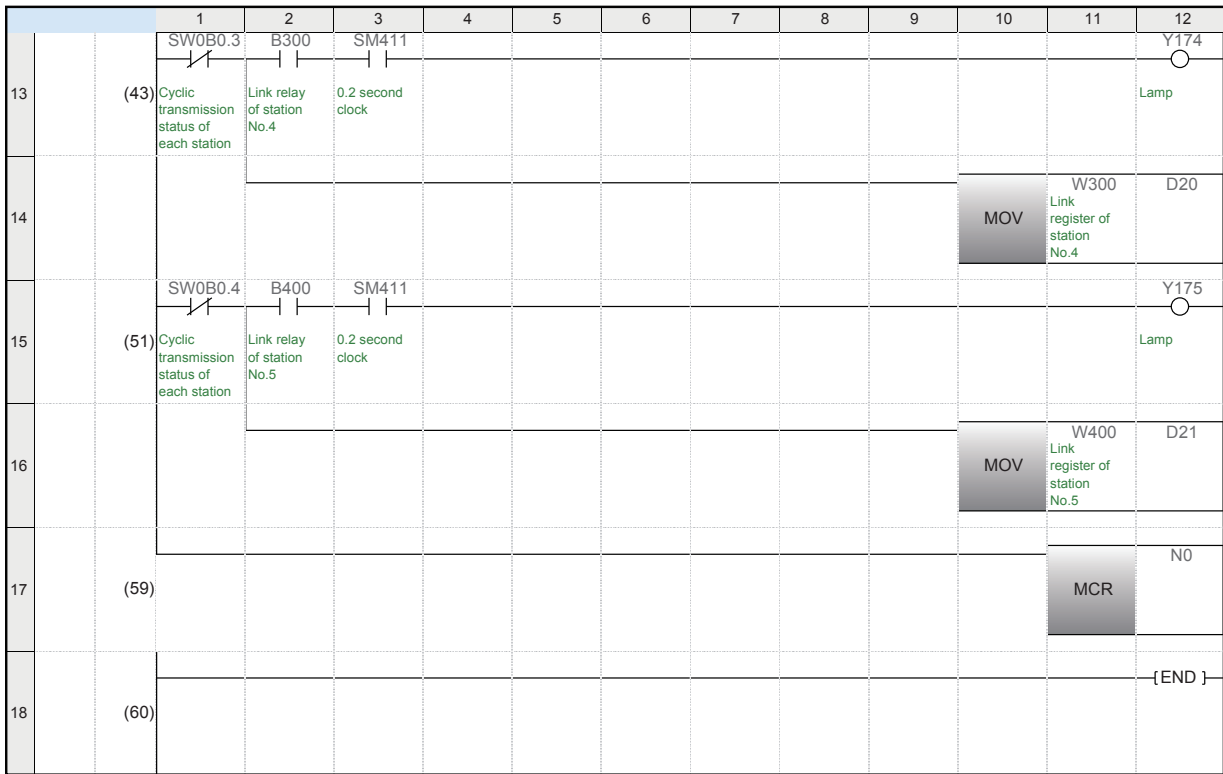
Note: The sequence scan time is extended according to the setting.
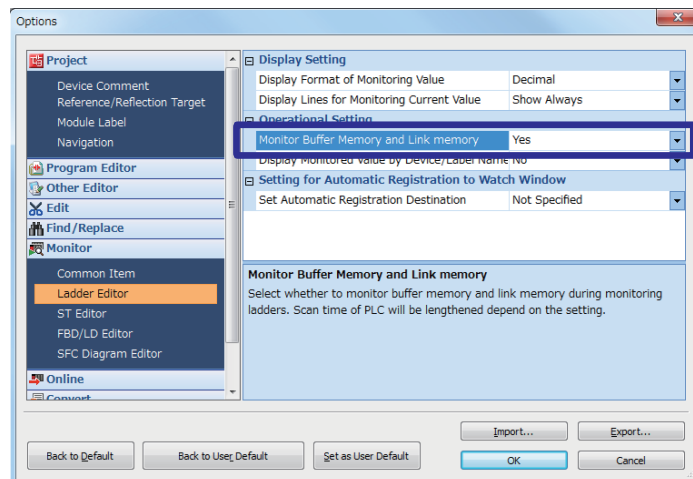
Sequence program

The following shows the sequence program of each station.

■Program for the control station (station No.1)

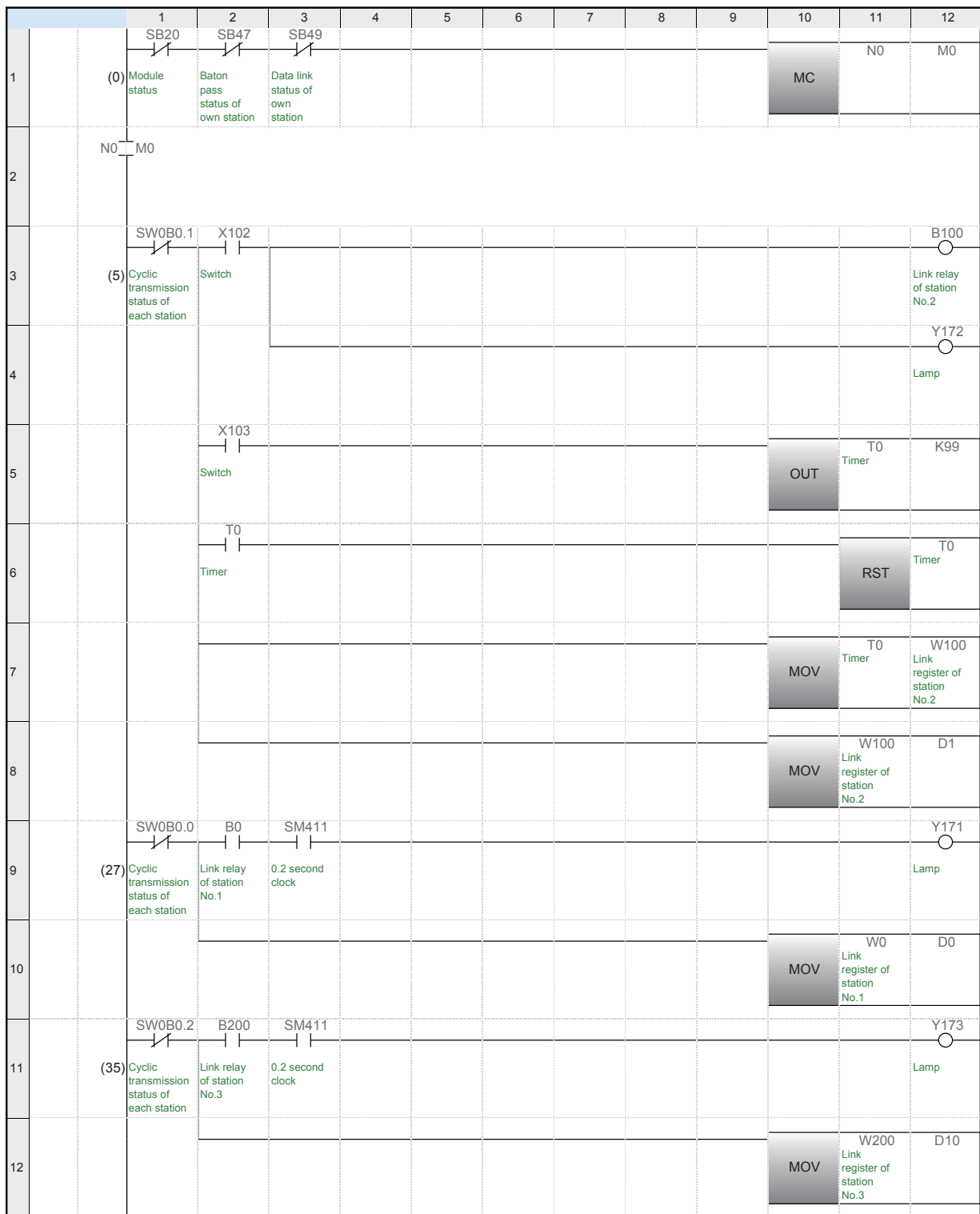When X102 of the control station (station No.1) turns on, Y171 of the control station (station No.1) turns on and Y171 of the normal station (station No.2) flashes. When X103 of the control station (station No.1) turns on, D0 of the control station (station No.1) and D0 of the normal station (station No.2) display the measurement value of the timer T0.

Project name	1Mp1 (direct access with two modules)
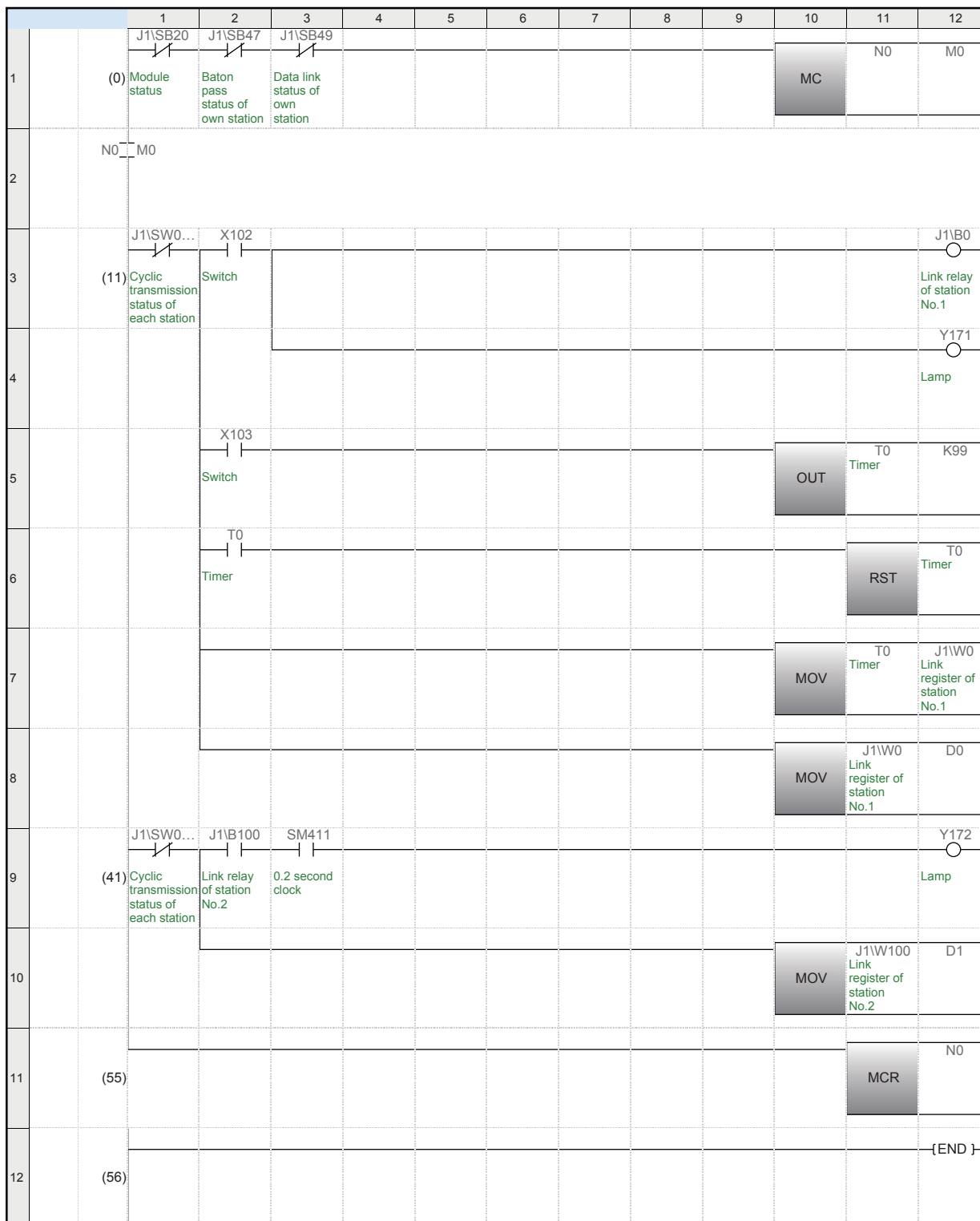
		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	J1\SB20 Module status	J1\SB47 Baton pass status of own station	J1\SB49 Data link status of own station							MC	N0	M0
2		N0 M0											
3	(11)	J1\SW0… Cyclic transmission status of each station	X102 Switch										J1\B0 Link relay of station No.1
4													Y171 Lamp
5			X103 Switch								OUT	T0 Timer	K99
6			T0 Timer								RST	T0 Timer	
7											MOV	T0 Timer	J1\W0 Link register of station No.1
8											MOV	J1\W0 Link register of station No.1	D0
9	(41)	J1\SW0… Cyclic transmission status of each station	J1\B100 Link relay of station No.2	SM411 0.2 second clock									Y172 Lamp
10											MOV	J1\W100 Link register of station No.2	D1
11	(55)										MCR	N0	
12	(56)												[END]

■Program for the normal station (station No.2)

When X102 of the normal station (station No.2) turns on, Y172 of the normal station (station No.2) turns on and Y172 of the control station (station No.1) flashes. When X103 of the normal station (station No.2) turns on, D1 of the normal station (station No.2) and D1 of the control station (station No.1) display the measurement value of timer T0.

Project name	1Ns2 (direct access with two modules)

	1	2	3	4	5	6	7	8	9	10	11	12
1 (0)	J1\SB20 Module status	J1\SB47 Baton pass status of own station	J1\SB49 Data link status of own station							MC	N0	M0
2	N0 M0											
3 (11)	J1\SW0... Cyclic transmission status of each station	X102 Switch										J1\B100 Link relay of station No.2
4												Y172 Lamp
5		X103 Switch								OUT	T0 Timer	K99
6		T0 Timer								RST	T0 Timer	
7										MOV	T0 Timer	J1\W100 Link register of station No.2
8										MOV	J1\W100 Link register of station No.2	D1
9 (41)	J1\SW0... Cyclic transmission status of each station	J1\B0 Link relay of station No.1	SM411 0.2 second clock									Y171 Lamp
10										MOV	J1\W0 Link register of station No.1	D0
11 (55)										MCR	N0	
12 (56)												{END}

3.12 Additional Demonstration of Cyclic Transmission

3.12.1 Demonstrations of cyclic transmission with three modules

Change the configuration of the demonstration machines as follows. Write parameters and sequence programs to each station and check the operation.

Setting parameters with GX Works3

Set the module parameters as follows.

For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Required Settings

• Control station (station No.1)

Item	Setting
Station Type	
Station Type	Control Station
Network Number	
Network Number	1
Station Number	
Station No.	1
Network Range Assignment	
Network Range Assignment Setting	<Detailed Setting>

• Normal station (station No.2)

Item	Setting
Station Type	
Station Type	Normal Station
Network Number	
Network Number	1
Station Number	
Setting Method	Parameter Editor
Station No.	2

• Normal station (station No.3)

Item	Setting
Station Type	
Station Type	Normal Station
Network Number	
Network Number	1
Station Number	
Setting Method	Parameter Editor
Station No.	3

■Network Range Assignment setting (control station only)

Setting Item

Total No. of Stations: 3   Switch Windows: LB/LW Setting (1)   Batch Setting(G)

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station	256	0000	00FF	256	00000	000FF	No Setting	Disable	
2	Normal Station	256	0100	01FF	256	00100	001FF	No Setting	Disable	
3	Normal Station	256	0200	02FF	256	00200	002FF	No Setting	Disable	

■Refresh Setting (common to all stations)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF
1	LB	768	00000	002FF	⬌	Specify Device	B	768	00000	002FF
2	LW	768	00000	002FF	⬌	Specify Device	W	768	00000	002FF
3					⬌					

Sequence program

The following shows the sequence program of each station.

■Program for the control station (station No.1)

Project name	1Mp1 (cyclic transmission with three modules)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB20 ⊣/⊢ Module status	SB47 ⊣⊢ Baton pass status of own station	SB49 ⊣⊢ Data link status of own station							MC	N0	M0
2		N0 — M0											
3	(5)	SW0B0.0 ⊣/⊢ Cyclic transmission status of each station	X102 ⊣⊢ Switch										B0 Link relay of station No.1
4				SM410 ⊣⊢ 0.1 second clock									Y171 Lamp
5			X103 ⊣⊢ Switch								MOVP	D20 Numerical input	W0 Link register of station No.1
6											MOV	W0 Link register of station No.1	D0
7	(19)	SW0B0.1 ⊣/⊢ Cyclic transmission status of each station	B100 ⊣⊢ Link relay of station No.2	SM410 ⊣⊢ 0.1 second clock									Y172 Lamp
8											MOV	W100 Link register of station No.2	D1
9	(27)	SW0B0.2 ⊣/⊢ Cyclic transmission status of each station	B200 ⊣⊢ Link relay of station No.3	SM410 ⊣⊢ 0.1 second clock									Y173 Lamp
10											MOV	W200 Link register of station No.3	D10
11	(35)										MCR	N0	
12	(36)												{END }

■Program for the normal station (station No.2)

Project name	1Ns2 (cyclic transmission with three modules)

Ladder diagram

Row 1 (0):
- SB20 (Module status) — SB47 (Baton pass status of own station) — SB49 (Data link status of own station) — [MC N0 M0]

Row 2:
- N0 M0

Row 3 (5):
- SW0B0.1 (Cyclic transmission status of each station, normally closed) — X102 (Switch, normally closed) — ( ) B100 (Link relay of station No.2)

Row 4:
- SM410 (0.1 second clock) — ( ) Y172 (Lamp)

Row 5:
- X103 (Switch) — [MOVP D20 (Numerical input) W100 (Link register of station No.2)]

Row 6:
- [MOV W100 (Link register of station No.2) D1]

Row 7 (19):
- SW0B0.0 (Cyclic transmission status of each station, normally closed) — B0 (Link relay of station No.1) — SM410 (0.1 second clock) — ( ) Y171 (Lamp)

Row 8:
- [MOV W0 (Link register of station No.1) D0]

Row 9 (27):
- SW0B0.2 (Cyclic transmission status of each station, normally closed) — B200 (Link relay of station No.3) — SM410 (0.1 second clock) — ( ) Y173 (Lamp)

Row 10:
- [MOV W200 (Link register of station No.3) D10]

Row 11 (35):
- [MCR N0]

Row 12 (36):
- [END]

■Program for the normal station (station No.3)

Project name	1Ns3 (cyclic transmission with three modules)

	1	2	3	4	5	6	7	8	9	10	11	12
1	(0) SB20 ─┤↑├─ Module status	SB47 ─┤↑├─ Baton pass status of own station	SB49 ─┤↑├─ Data link status of own station							MC	N0	M0
2	N0 M0											
3	(5) SW0B0.2 ─┤↑├─ Cyclic transmission status of each station	X102 ─┤├─ Switch										B200 ◯ Link relay of station No.3
4			SM410 ─┤├─ 0.1 second clock									Y173 ◯ Lamp
5			X103 ─┤├─ Switch							MOVP	D20 Numerical input	W200 Link register of station No.3
6										MOV	W200 Link register of station No.3	D10
7	(19) SW0B0.0 ─┤↑├─ Cyclic transmission status of each station	B0 ─┤↑├─ Link relay of station No.1	SM410 ─┤├─ 0.1 second clock									Y171 ◯ Lamp
8										MOV	W0 Link register of station No.1	D0
9	(27) SW0B0.1 ─┤↑├─ Cyclic transmission status of each station	B100 ─┤↑├─ Link relay of station No.2	SM410 ─┤├─ 0.1 second clock									Y172 ◯ Lamp
10										MOV	W100 Link register of station No.2	D1
11	(35)									MCR	N0	
12	(36)											[END]

Operation method (common to all stations)

1. Turn on X102.

The LED corresponding to the operated station flashes.

Station No.1: Y171

Station No.2: Y172

Station No.3: Y173

2. Turn on X103.

The data set to the initial input device D20 is displayed by the initial indication device corresponding to each station.

Station No.1: D0

Station No.2: D1

Station No.3: D10

3.12.2 Demonstrations of cyclic transmission with five modules

Change the configuration of the demonstration machines as follows. Write parameters and sequence programs to each station and check the operation.

```
┌─────────┐   ┌─────────┐   ┌─────────┐
│ Station │   │ Station │   │ Station │
│  No.1   │   │  No.2   │   │  No.3   │
└─────────┘   └─────────┘   └─────────┘
    │   │        │   │         │   │
╭───────────────────────────────────────╮
│                                        │
│           Network No.1                 │
│                                        │
╰───────────────────────────────────────╯
           │   │          │   │
      ┌─────────┐    ┌─────────┐
      │ Station │    │ Station │
      │  No.5   │    │  No.4   │
      └─────────┘    └─────────┘
```

Setting parameters with GX Works3

Set the module parameters as follows.
For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Required Settings

• Control station (station No.1)

Item	Setting
⊟ **Station Type**	
Station Type	Control Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Station No.	1
⊟ **Network Range Assignment**	
Network Range Assignment Setting	<Detailed Setting>

• Normal station (station No.2)

Item	Setting
⊟ **Station Type**	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	2

• Normal station (station No.3)

Item	Setting
⊟ **Station Type**	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	3

• Normal station (station No.4)

Item	Setting
⊟ **Station Type**	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	4

- Normal station (station No.5)

Item	Setting
Station Type	
Station Type	Normal Station
Network Number	
Network Number	1
Station Number	
Setting Method	Parameter Editor
Station No.	5

■Network Range Assignment setting (control station only)

Setting Item

Total No. of Stations: 5   Switch Windows: LB/LW Setting (1)   Batch Setting(G)

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station	256	0000	00FF	256	00000	000FF	No Setting	Disable	
2	Normal Station	256	0100	01FF	256	00100	001FF	No Setting	Disable	
3	Normal Station	256	0200	02FF	256	00200	002FF	No Setting	Disable	
4	Normal Station	256	0300	03FF	256	00300	003FF	No Setting	Disable	
5	Normal Station	256	0400	04FF	256	00400	004FF	No Setting	Disable	

■Refresh Setting (common to all stations)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF	
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF	
1	LB	1280	00000	004FF	⬌	Specify Device	B	1280	00000	004FF	
2	LW	1280	00000	004FF	⬌	Specify Device	W	1280	00000	004FF	
3					⬌						

Sequence program

The following shows the sequence program of each station.

■Program for the control station (station No.1)

Project name	1Mp1 (cyclic transmission with five modules)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB20 / Module status	SB47 / Baton pass status of own station	SB49 / Data link status of own station							MC	N0	M0
2		N0　M0											
3	(5)	SW0B0.0 / Cyclic transmission status of each station	X102 / Switch										B0 / Link relay of station No.1
4													Y171 / Lamp
5			X103 / Switch								OUT	T0 / Timer	K99
6			T0 / Timer								RST	T0 / Timer	
7											MOV	T0 / Timer	W0 / Link register of station No.1
8											MOV	W0 / Link register of station No.1	D0
9	(27)	SW0B0.1 / Cyclic transmission status of each station	B100 / Link relay of station No.2	SM411 / 0.2 second clock									Y172 / Lamp
10											MOV	W100 / Link register of station No.2	D1
11	(35)	SW0B0.2 / Cyclic transmission status of each station	B200 / Link relay of station No.3	SM411 / 0.2 second clock									Y173 / Lamp
12											MOV	W200 / Link register of station No.3	D10

		1	2	3	4	5	6	7	8	9	10	11	12
13	(43)	SW0B0.3 Cyclic transmission status of each station	B300 Link relay of station No.4	SM411 0.2 second clock									Y174 ◯ Lamp
14											MOV	W300 Link register of station No.4	D20
15	(51)	SW0B0.4 Cyclic transmission status of each station	B400 Link relay of station No.5	SM411 0.2 second clock									Y175 ◯ Lamp
16											MOV	W400 Link register of station No.5	D21
17	(59)											MCR	N0
18	(60)												[END]

3

■Program for the normal station (station No.2)

Project name	1Ns2 (cyclic transmission with five modules)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB20 (Module status)	SB47 (Baton pass status of own station)	SB49 (Data link status of own station)							MC	N0	M0
2		N0 — M0											
3	(5)	SW0B0.1 (Cyclic transmission status of each station)	X102 (Switch)										B100 (Link relay of station No.2)
4													Y172 (Lamp)
5			X103 (Switch)								OUT	T0 (Timer)	K99
6			T0 (Timer)								RST	T0 (Timer)	
7											MOV	T0 (Timer)	W100 (Link register of station No.2)
8											MOV	W100 (Link register of station No.2)	D1
9	(27)	SW0B0.0 (Cyclic transmission status of each station)	B0 (Link relay of station No.1)	SM411 (0.2 second clock)									Y171 (Lamp)
10											MOV	W0 (Link register of station No.1)	D0
11	(35)	SW0B0.2 (Cyclic transmission status of each station)	B200 (Link relay of station No.3)	SM411 (0.2 second clock)									Y173 (Lamp)
12											MOV	W200 (Link register of station No.3)	D10

		1	2	3	4	5	6	7	8	9	10	11	12
13	(43)	SW0B0.3 ⊣／⊢ Cyclic transmission status of each station	B300 ⊣ ⊢ Link relay of station No.4	SM411 ⊣ ⊢ 0.2 second clock									Y174 ◯ Lamp
14											MOV	W300 Link register of station No.4	D20
15	(51)	SW0B0.4 ⊣／⊢ Cyclic transmission status of each station	B400 ⊣ ⊢ Link relay of station No.5	SM411 ⊣ ⊢ 0.2 second clock									Y175 ◯ Lamp
16											MOV	W400 Link register of station No.5	D21
17	(59)											MCR	N0
18	(60)												[END]

■Program for the normal station (station No.3)

Project name	1Ns3 (cyclic transmission with five modules)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB20 ⊣/⊢ Module status	SB47 ⊣/⊢ Baton pass status of own station	SB49 ⊣/⊢ Data link status of own station							MC	N0	M0
2		N0 — M0											
3	(5)	SW0B0.2 ⊣/⊢ Cyclic transmission status of each station	X102 ⊣ ⊢ Switch										B200 ◯ Link relay of station No.3
4													Y173 ◯ Lamp
5			X103 ⊣ ⊢ Switch								OUT	T0 Timer	K99
6			T0 ⊣ ⊢ Timer								RST	T0 Timer	
7											MOV	T0 Timer	W200 Link register of station No.3
8											MOV	W200 Link register of station No.3	D10
9	(27)	SW0B0.0 ⊣/⊢ Cyclic transmission status of each station	B0 ⊣ ⊢ Link relay of station No.1	SM411 ⊣ ⊢ 0.2 second clock									Y171 ◯ Lamp
10											MOV	W0 Link register of station No.1	D0
11	(35)	SW0B0.1 ⊣/⊢ Cyclic transmission status of each station	B100 ⊣ ⊢ Link relay of station No.2	SM411 ⊣ ⊢ 0.2 second clock									Y172 ◯ Lamp
12											MOV	W100 Link register of station No.2	D1

	1	2	3	4	5	6	7	8	9	10	11	12
13 (43)	SW0B0.3 — Cyclic transmission status of each station	B300 — Link relay of station No.4	SM411 — 0.2 second clock									Y174 ◯ — Lamp
14										MOV	W300 — Link register of station No.4	D20
15 (51)	SW0B0.4 — Cyclic transmission status of each station	B400 — Link relay of station No.5	SM411 — 0.2 second clock									Y175 ◯ — Lamp
16										MOV	W400 — Link register of station No.5	D21
17 (59)											MCR	N0
18 (60)												[END]

3

■Program for the normal station (station No.4)

Project name	1Ns4 (cyclic transmission with five modules)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB20 ⊣/⊢ Module status	SB47 ⊣/⊢ Baton pass status of own station	SB49 ⊣/⊢ Data link status of own station							MC	N0	M0
2		N0 ⊣ M0											
3	(5)	SW0B0.3 ⊣/⊢ Cyclic transmission status of each station	X102 ⊣ ⊢ Switch										B300 ◯ Link relay of station No.4
4													Y174 ◯ Lamp
5			X103 ⊣ ⊢ Switch								OUT	T0 Timer	K99
6			T0 ⊣ ⊢ Timer								RST	T0 Timer	
7											MOV	T0 Timer	W300 Link register of station No.4
8											MOV	W300 Link register of station No.4	D20
9	(27)	SW0B0.0 ⊣/⊢ Cyclic transmission status of each station	B0 ⊣ ⊢ Link relay of station No.1	SM411 ⊣ ⊢ 0.2 second clock									Y171 ◯ Lamp
10											MOV	W0 Link register of station No.1	D0
11	(35)	SW0B0.1 ⊣/⊢ Cyclic transmission status of each station	B100 ⊣ ⊢ Link relay of station No.2	SM411 ⊣ ⊢ 0.2 second clock									Y172 ◯ Lamp
12											MOV	W100 Link register of station No.2	D1

		1	2	3	4	5	6	7	8	9	10	11	12
13	(43)	SW0B0.2 Cyclic transmission status of each station	B200 Link relay of station No.3	SM411 0.2 second clock									Y173 Lamp
14											MOV	W200 Link register of station No.3	D10
15	(51)	SW0B0.4 Cyclic transmission status of each station	B400 Link relay of station No.5	SM411 0.2 second clock									Y175 Lamp
16											MOV	W400 Link register of station No.5	D21
17	(59)											MCR	N0
18	(60)												[END]

■Program for the normal station (station No.5)

Project name	1Ns5 (cyclic transmission with five modules)

	1	2	3	4	5	6	7	8	9	10	11	12
1	(0) SB20 ─┤/├─ Module status	SB47 ─┤/├─ Baton pass status of own station	SB49 ─┤/├─ Data link status of own station							MC	N0	M0
2	N0──M0											
3	(5) SW0B0.4 ─┤/├─ Cyclic transmission status of each station	X102 ─┤├─ Switch										B400 ◯ Link relay of station No.5
4												Y175 ◯ Lamp
5		X103 ─┤├─ Switch								OUT	T0 Timer	K99
6		T0 ─┤├─ Timer								RST	T0 Timer	
7										MOV	T0 Timer	W400 Link register of station No.5
8										MOV	W400 Link register of station No.5	D21
9	(27) SW0B0.0 ─┤/├─ Cyclic transmission status of each station	B0 ─┤├─ Link relay of station No.1	SM411 ─┤├─ 0.2 second clock									Y171 ◯ Lamp
10										MOV	W0 Link register of station No.1	D0
11	(35) SW0B0.1 ─┤/├─ Cyclic transmission status of each station	B100 ─┤├─ Link relay of station No.2	SM411 ─┤├─ 0.2 second clock									Y172 ◯ Lamp
12										MOV	W100 Link register of station No.2	D1

		1	2	3	4	5	6	7	8	9	10	11	12
13	(43)	SW0B0.2 — Cyclic transmission status of each station	B200 — Link relay of station No.3	SM411 — 0.2 second clock									Y173 — Lamp
14											MOV	W200 — Link register of station No.3	D10
15	(51)	SW0B0.3 — Cyclic transmission status of each station	B300 — Link relay of station No.4	SM411 — 0.2 second clock									Y174 — Lamp
16											MOV	W300 — Link register of station No.4	D20
17	(59)											MCR	N0
18	(60)												[END]

3

Operation method (common to all stations)

1. Turn on X102.

The LED of the operated own station turns on and the LED of other stations flashes.

Station No.1: Y171

Station No.2: Y172

Station No.3: Y173

Station No.4: Y174

Station No.5: Y175

2. Turn on X103.

The measurement value of the own station timer T0 is displayed by the initial indication device corresponding to each station.

Station No.1: D0

Station No.2: D1

Station No.3: D10

Station No.4: D20

Station No.5: D21

1. Turn on X102.

4 EXERCISE II (TRANSIENT TRANSMISSION)

The system configuration of the demonstration machine for Exercise I is used.

4.1 Transient Transmission Function

This function performs data communications only when a communication request is issued among stations.

The requests of the transient function can be issued by GX Works3, intelligent function modules, or link dedicated instructions (SEND, RECV, READ, WRITE, REQ, ZNRD, ZNWR).

CC-Link IE Controller Network allows communications not only with stations of the same network number as that of the own station but also with stations of other network numbers.

4.1.1 Dedicated instructions

This section describes the dedicated instructions that can be used in the CC-Link IE Controller Network-equipped modules and the transmission ranges.

> **Point**
>
> For details on dedicated instructions, refer to the following.
> 📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks)

Link dedicated instructions

These instructions are used for transient transmission from or to programmable controllers on other stations. Each link dedicated instruction allows access to a station on a network other than CC-Link IE Controller Network.

Instruction	Description
READ	Reads data from the word device of another station.
SREAD	Reads data from the word device of another station (with the completion device).
WRITE	Writes data to the word device of another station.
SWRITE	Writes data to the word device of another station (with the completion device).
SEND	Sends data to another station.
RECV	Reads the receive data from another station (for main program).
RECVS	Reads the receive data from another station (for interrupt program).
REQ	Executes remote RUN/STOP to the CPU module on another station.
	Reads/writes clock data from/to another station.
ZNRD	Reads data from the word device of another station (for A series).
ZNWR	Writes data to the word device of another station (for A series).
RRUN	Sends the request of remote RUN to another station.
RSTOP	Sends the request of remote STOP to another station.
RTMRD	Reads the clock data from another station.
RTMWR	Writes the clock data to another station.

■Transient transmission range of the link dedicated instructions

In a single network system, communications with all stations on the network are allowed.

In a multi-network system, communications can be made with stations up to eight networks apart.

CC-Link IE Controller dedicated instructions

These instructions are used for transient transmission with CC-Link IE Controller Network devices.

Instruction	Description
RIRD	Reads the specified number of points of data from a device of the target station.
RIWT	Writes the specified number of points of data to a device of the target station.

■Transient transmission range of CC-Link IE Controller dedicated instructions

Communications with all stations in the same network are available.

Communications are not available with stations in other networks.

Another dedicated instruction

This instruction is for setting the parameter on the CC-Link IE Controller Network-equipped module of the own station.

Instruction	Description
UINI	Sets a station number for a local station.

■Transient transmission range of another dedicated instruction

Only the CC-Link IE Controller Network-equipped module of the own station can be accessed.

4.1.2   Instruction format

This section describes the format of the SEND/RECV instructions.

JP.SEND, GP.SEND

`RnCPU` `RnENCPU` `RnPCPU` `RnSFCPU (Standard)` `RnSFCPU (Safety)` ✕

These instructions send data to the programmable controller of another station.

Ladder	ST
─┤□:─:□├─ (J/U) (s1) (s2) (d)	ENO:=JP_SEND(EN,J,s1,s2,d); ENO:=GP_SEND(EN,U,s1,s2,d);

FBD/LD
┌─□:─:□─┐ ─┤ EN   ENO ├─ ─┤ J/U   d ├─ ─┤ s1 ─┤ s2 └──────┘
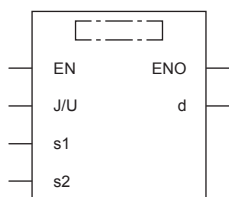
■Execution condition

Instruction	Execution condition
JP.SEND GP.SEND	─┌─

Setting data

■Description, range, data type

Operand		Description	Range	Data type	Data type (label)
(J/U)	JP.SEND	(J): Own station network number	1 to 239	16-bit unsigned binary	ANY16
	GP.SEND	(U): Start I/O number (first three digits in four-digit hexadecimal representation) of own station or own node	00H to FEH	16-bit unsigned binary	ANY16
(s1)		Own station start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(s2)		Own station start device where send data is stored	—	Device name	ANY16[*1]
(d)		Own station device to be turned on one scan when the instruction completes. (d)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN		Execution condition	—	Bit	BOOL
ENO		Execution result	—	Bit	BOOL

*1   When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

Point

The SEND instruction cannot be executed when the target station is ACPU.

■Applicable devices
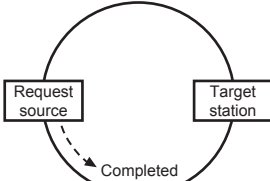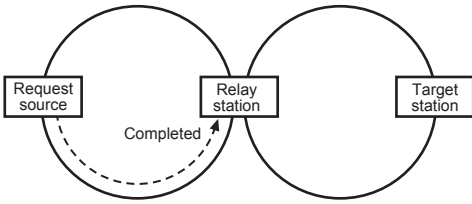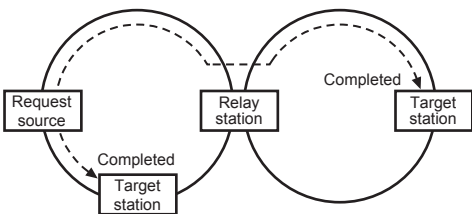
Operand		Bit		Word				Double word			Indirect specification	Constant				Others	
		X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z	LT, LST, LC	LZ				K, H	E	$	J	U	
(J/U)	JP.SEND	—	—	—	—	—	—	—	—	—	—	—	—	—	○	—	
	GP.SEND	—	—	○	—	—	—	—	○	○	—	—	—	○			
(s1)		—	—	○*2	—	—	—	—	○	—	—	—	—	—			
(s2)		—	—	○*2	—	—	—	—	○	—	—	—	—	—			
(d)		○*1	—	○*3	—	—	—	—	—	—	—	—	—	—			

*1 FX and FY cannot be used.

*2 FD cannot be used.

*3 T, ST, C, and FD cannot be used.

■Control data

Operand: (s1)					
Device	**Item**	**Description**		**Setting range**	**Set by**
+0	Execution/error completion type	(1) Execution type (bit 0) • 0: No arrival check When the target station is in the same network: Completed when data has been sent from the own station. When the target station is in another network: Completed when data has arrived at the relay station of the own network. • 1: With arrival check Completed when data has been stored in the specified channel of the target station. (2) Error completion type (bit 7) Specify whether to set clock data when the instruction is completed with an error. • 0: Clock data at error occurrence is not stored in (s1)+11 and later. • 1: Clock data at error occurrence is stored in (s1)+11 and later.		0000H 0001H 0080H 0081H	User
+1	Completion status	The instruction completion status is stored. • 0: Normal • Other than 0: Error (error code)		—	System
+2	Own station channel	Specify the channel to be used by the own station.		1 to 8, 11 to 18	User
+3	Target station storage channel	Specify the channel of the target station for storing data. (CC-Link IE Field Network only: 1 or 2)		1 to 8	User
+4	Target network number	Specify the network number of the target station. • 1 to 239 (Network number)		1 to 239	User

Operand: (s1)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+5	Target station number	Specify the station number of the target station. (1) Station number specification [Ethernet or CC-Link IE Controller Network] • 0001H to 0078H (1 to 120): Station number [CC-Link IE Field Network] • 007DH (125): Master station • 007EH (126): Master operating station • 0001H to 0078H (1 to 120): Local station, intelligent device station, submaster station (2) Group number specification [Ethernet or CC-Link IE Controller Network] 0081H to 00A0H: All stations with group numbers 01H to 20H (The number can be set when the execution type specified by (s1) is "0: No arrival check".) (3) All-station specification 00FFH: All stations of target network number (broadcast (excluding the own station)) (The number can be set when the execution type specified by (s1) is "0: No arrival check".)	0001H to 0078H, 007DH, 007EH, 0081H to 00A0H, 00FFH	User
+6	Not used	—	—	—
+7	Number of resends (retries)	Effective when the execution type specified by (s1) is "1: With arrival check". ■Before instruction execution Specify the number of resends to be performed if the instruction is not completed within the monitoring time specified by (s1)+8. • 0 to 15 (times) ■At completion of instruction The number of resends performed (result) is stored. • 0 to 15 (times)	0 to 15	User/ system
+8	Arrival monitoring time	[CC-Link IE Controller Network or CC-Link IE Field Network] Specify the monitoring time until completion of processing. If processing is not completed within the monitoring time, the request is resent by the number of resends specified by (s1)+7. • 0: 10 seconds • 1 to 32767: 1 to 32767 seconds	0, 1 to 32767	User
		[Ethernet] Specify the TCP resend timer value or greater for the monitoring time until completion of processing. If processing is not completed within the monitoring time, the request is resent by the number of resends specified by (s1)+7 (Number of resends). • 0 to (TCP resend timer value): The TCP resend timer value is assumed as the monitoring time. • (TCP resend timer value + 1) to 16383: (TCP resend timer value + 1) to 16383 seconds	0 to 16383	User
+9	Send data length	Specify the number of send data from (s2) to (s2)+n. (No information is stored if an error is detected in the own station.) ■Sending data to RCPU, QCPU, or LCPU • 1 to 960 (words) ■Sending data to QnACPU • 1 to 480 (words)	1 to 960, 1 to 480	User
+10	Not used	—	—	—
+11	Clock setting flag	The validity status (valid or invalid) of the data in (s1)+12 and later is stored. Note that the data in (s1)+12 and later is not cleared even when the instruction is completed successfully. • 0: Invalid • 1: Valid	—	System
+12	Clock data (Set only in an abnormal state)	Upper 8 bits: Month (01H to 12H) Lower 8 bits: Lower 2 digits of year (00H to 99H)	—	System
+13		Upper 8 bits: Hour (00H to 23H) Lower 8 bits: Day (01H to 31H)	—	System
+14		Upper 8 bits: Second (00H to 59H) Lower 8 bits: Minute (00H to 59H)	—	System
+15		Upper 8 bits: Upper 2 digits of year (00H to 99H) Lower 8 bits: Day of the week (00H (Sun.) to 06H (Sat.))	—	System
+16	Error detection network number	The network number of the station in which an error was detected is stored. (No information is stored if an error is detected in the own station.) • 1 to 239 (Network number)	1 to 239	System

4

Operand: (s1)					
Device	**Item**	**Description**	**Setting range**	**Set by**	
+17	Error-detected station number	The station number of the station in which an error was detected is stored. (No information is stored if an error is detected in the own station.) [Ethernet or CC-Link IE Controller Network] • 1 to 120: Station number [CC-Link IE Field Network] • 125: Master station • 1 to 120: Local station, intelligent device station, submaster station	1 to 120, 125	System	

Point

- The continuous area (a maximum of 960 words) for the send data length ((s1)+9) is required in the send data storage device (s2).
- When a number from 1 to 120 is specified for the target station number, the instruction should be executed with the execution type set to "With arrival check" to improve data reliability. When a group number or all stations are specified, the instruction should be executed with the execution type set to "No arrival check".
- When sending data to the same channel in the receiving station, execute the instruction after data has been read by the RECV instruction in the receiving station. When the execution type is set to "No arrival check", successful completion results in the sending station if communications are completed successfully even when the send data contains an error. Also, even when the send data is normal, a timeout results in the sending station if the instructions are executed for the same station from multiple stations.
- With the execution type set to "With arrival check", if the sending station sends data to the same channel in the receiving station before the receiving station reads data using the RECV instruction, a buffer full error results in the sending station.
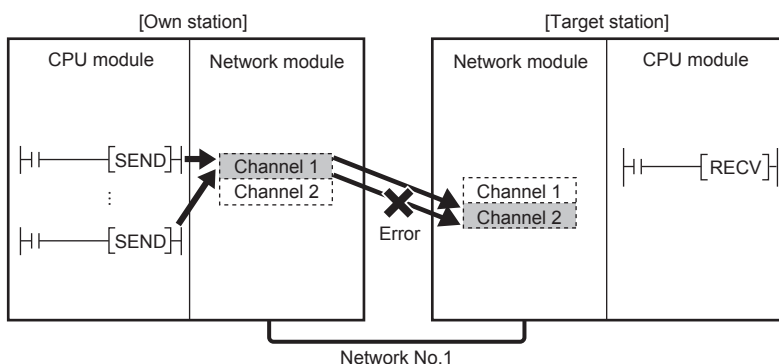
- When multiple network modules are mounted in the target station, specify the network number and station number of the network module that receives a request from the own station.

(Example: In the following figure, specify station number 1 of network number 1. (Station number 5 of network number 2 cannot be specified.))
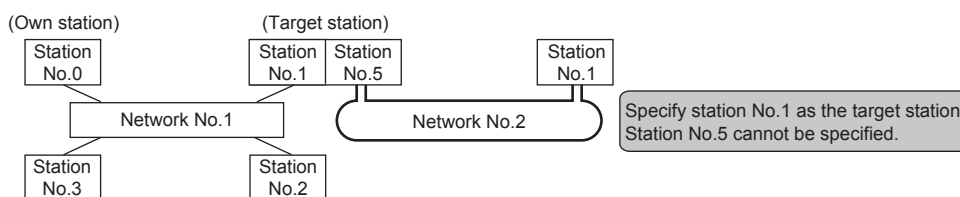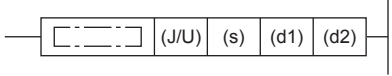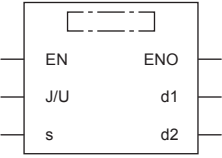
- The number of resends (s1)+7 must be set every time the instruction is executed.

JP.RECV, GP.RECV

RnCPU RnENCPU RnPCPU RnSFCPU (Standard) RnSFCPU (Safety) ✕

These instructions read the data received from the programmable controller of another station (for the main routine program).

Ladder		ST
┌─┈─┐ (J/U) (s) (d1) (d2)		ENO:=JP_RECV(EN,J,s,d1,d2); ENO:=GP_RECV(EN,U,s,d1,d2);

FBD/LD
┌─┈─┐ EN   ENO J/U   d1 s   d2

■Execution condition

Instruction	Execution condition
JP.RECV GP.RECV	┌─┘‾

Setting data

■Description, range, data type

Operand		Description	Range	Data type	Data type (label)
(J/U)	JP.RECV	(J): Own station network number	1 to 239	16-bit unsigned binary	ANY16
	GP.RECV	(U): Start I/O number (first three digits in four-digit hexadecimal representation) of own station or own node	00H to FEH	16-bit unsigned binary	ANY16
(s)		Own station start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(d1)		Own station start device for storing the receive data (A continuous area for the receive data length is required.)	—	Device name	ANY16[*1]
(d2)		Own station device to be turned on one scan when the instruction completes. (d2)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN		Execution condition	—	Bit	BOOL
ENO		Execution result	—	Bit	BOOL

*1 When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

Operand		Bit		Word				Double word			Indirect specification	Constant				Others	
		X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z		LT, LST, LC	LZ			K, H	E	$	J	U
(J/U)	JP.RECV	—	—	—	—	—		—	—		—	—	—	—	○	—
	GP.RECV	—	—	○	—	—		—	—		○	○	—	—	—	○
(s)		—	—	○*2	—	—		—	—		○	—	—	—	—	—
(d1)		—	—	○*2	—	—		—	—		○	—	—	—	—	—
(d2)		○*1	—	○*3	—	—		—	—		—	—	—	—	—	—

*1 FX and FY cannot be used.
*2 FD cannot be used.
*3 T, ST, C, and FD cannot be used.

■Control data

Operand: (s)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	Error completion type	b15 ••• b7 ••• b0 [0 | (1) | 0] (1) Error completion type (bit 7) Specify whether to set clock data when the instruction is completed with an error. • 0: Clock data at error occurrence is not stored in (s1)+11 and later. • 1: Clock data at error occurrence is stored in (s1)+11 and later.	0000H 0080H	User
+1	Completion status	The instruction completion status is stored. • 0: Normal • Other than 0: Error (error code)	—	System
+2	Own station storage channel	Specify the channel to be used by the own station.	1 to 8, 11 to 18	User
+3	Channel used by sending station	The channel number (1 to 8) used by the sending station is stored.	1 to 8	System
+4	Sending station network number	The network number (1 to 239) of the sending station is stored.	1 to 239	System
+5	Sending station number	The station number of the sending station is stored. [Ethernet or CC-Link IE Controller Network] • 1 to 120: Station number (station number from which data is received) [CC-Link IE Field Network] • 125: Master station • 1 to 120: Local station, intelligent device station, submaster station	1 to 120, 125	System
+6	Not used	—	—	—
+7	Not used	—	—	—
+8	Arrival monitoring time	[CC-Link IE Controller Network or CC-Link IE Field Network] Specify the monitoring time until completion of processing. The instruction is completed with an error if it fails to complete within the monitoring time. • 0: 10 seconds • 1 to 32767: 1 to 32767 seconds	0, 1 to 32767	User
		[Ethernet] Specify the TCP resend timer value or greater for the monitoring time until completion of processing. The instruction is completed with an error if it fails to complete within the monitoring time. • 0 to (TCP resend timer value): The TCP resend timer value is assumed as the monitoring time. • (TCP resend timer value + 1) to 16383: (TCP resend timer value + 1) to 16383 seconds	0 to 16383	User
+9	Receive data length	The number of data received and stored in (d1) to (d1)+n is stored. • 0: No receive data • 1 to 960: Number of words of receive data	0 to 960	System
+10	Not used	—	—	—

Operand: (s)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+11	Clock setting flag	The validity status (valid or invalid) of the data in (s)+12 and later is stored. Note that the data in (s)+12 and later is not cleared even when the instruction is completed successfully. • 0: Invalid • 1: Valid	—	System
+12	Clock data (Set only in an abnormal state)	Upper 8 bits: Month (01H to 12H) Lower 8 bits: Lower 2 digits of year (00H to 99H)	—	System
+13		Upper 8 bits: Hour (00H to 23H) Lower 8 bits: Day (01H to 31H)	—	System
+14		Upper 8 bits: Second (00H to 59H) Lower 8 bits: Minute (00H to 59H)	—	System
+15		Upper 8 bits: Upper 2 digits of year (00H to 99H) Lower 8 bits: Day of the week (00H (Sun.) to 06H (Sat.))	—	System
+16	Error detection network number	The network number of the station in which an error was detected is stored. (No information is stored if an error is detected in the own station.) • 1 to 239 (Network number)	1 to 239	System
+17	Error-detected station number	The station number of the station in which an error was detected is stored. (No information is stored if an error is detected in the own station.) [Ethernet or CC-Link IE Controller Network] • 1 to 120: Station number [CC-Link IE Field Network] • 125: Master station • 1 to 120: Local station, intelligent device station, submaster station	1 to 120, 125	System

Point

- The continuous area (a maximum of 960 words) for the receive data length ((s)+9) is required in the receive data storage device (d1).
- The RECV instruction is executed each time the bit of the relevant channel in the RECV instruction request area (address 205) in the buffer memory is set to on (receive data exists).
- When multiple network modules with the same network number are mounted in the own station, specify "U" (start I/O number) to execute the RECV instruction. The RECV instruction cannot be executed by specifying "J" (network number).

(Example: When executing the GP.RECV instruction in station number 3 with regard to the SEND instruction from station number 1, specify "U2".)
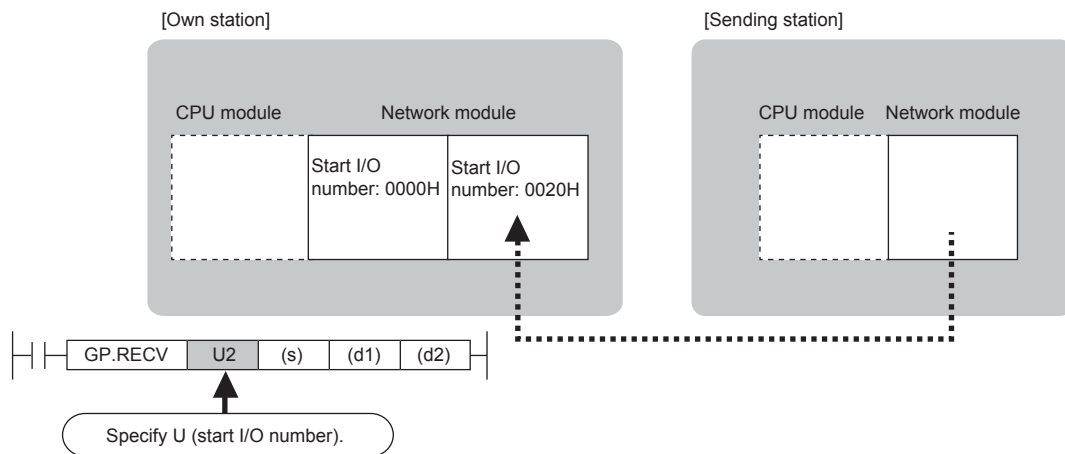
4.1.3 Checking the send/receive status of data

Perform demonstrations of the transient transmission.

Check that data can be sent (1Mp1) and received (1Ns2) by using the link dedicated instructions (SEND/RECV).

Change the configuration of the demonstration machines as follows. Write parameters and sequence programs to each station and check the operation.

Setting parameters with GX Works3

Set the module parameters as follows.

For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Required Settings

• Control station (station No.1)

Item	Setting
Station Type	
Station Type	Control Station
Network Number	
Network Number	1
Station Number	
Station No.	1
Network Range Assignment	
Network Range Assignment Setting	\<Detailed Setting\>

• Normal station (station No.2)

Item	Setting
Station Type	
Station Type	Normal Station
Network Number	
Network Number	1
Station Number	
Setting Method	Parameter Editor
Station No.	2

■Network Range Assignment setting (control station only)

Total No. of Stations 2   Switch Windows LB/LW Setting (1)   Batch Setting(G)

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station							No Setting	Disable	
2	Normal Station							No Setting	Disable	

■Refresh Setting (common to all stations)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF
-	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF

Sequence program

The following shows the sequence program of each station.

■Program for the control station (station No.1)

Project name	1Mp1 (transient transmission (SEND_RECV))

1 Send data setting

(0) X100 — Switch
MOV | D20 Numerical input | D101 Start device for storing send data

RST | M110 Normal

RST | M111 Fault

5 Send data check

(25) SM400 — Always On
MOV | D101 Start device for storing send data | D0

7 Own station status

8 Master control

(45) SB20 (Module status) — SB47 (Baton pass status of own station) — SB49 (Data link status of own station)
MC | N0 | M0

N0 — M0

11 Other stations status

12 Master control

(86) SW0A0.1 (Baton pass status of each station) — SW0B0.1 (Cyclic transmission status of each station)
MC | N1 | M1

N1 — M1

15 SEND instruction data setting

16 Execution/error completion type

(129) X101 — Switch
MOV | H81 | D200 Start device for storing control data

18 Own station channel

	1	2	3	4	5	6	7	8	9	10	11	12
19										MOV	K1	D202
20										Target station storage channel		
21										MOV	K1	D203
22										Target network No.		
23										MOV	K1	D204
24										Target station No.		
25										MOV	K2	D205
26										Number of resends		
27										MOV	K5	D207
28										Arrival monitoring time		
29										MOV	K2	D208
30										Send data length		
31										MOV	K1	D209
32	SEND instruction execution											
33	(366) ┤↑├ X101 Switch							JP.SEND	J1	D200 Start device for storing control data	D101 Start device for storing send data	M100 Send completion
34	(405) ┤├ M100 Send completion	┤/├ M101 Send result error								SET	M110 Normal	

	1	2	3	4	5	6	7	8	9	10	11	12
35											RST	M111 Fault
36		M101 Send result error									SET	M111 Fault
37											RST	M110 Normal
38	(414)	M110 Normal										Y171 ◯ Lamp
39		M111 Fault	SM412 1 second clock							MOVP	D201 Completion status	D250 Status storage location
40	(422)										MCR	N1
41	(423)										MCR	N0
42	(424)											{END }
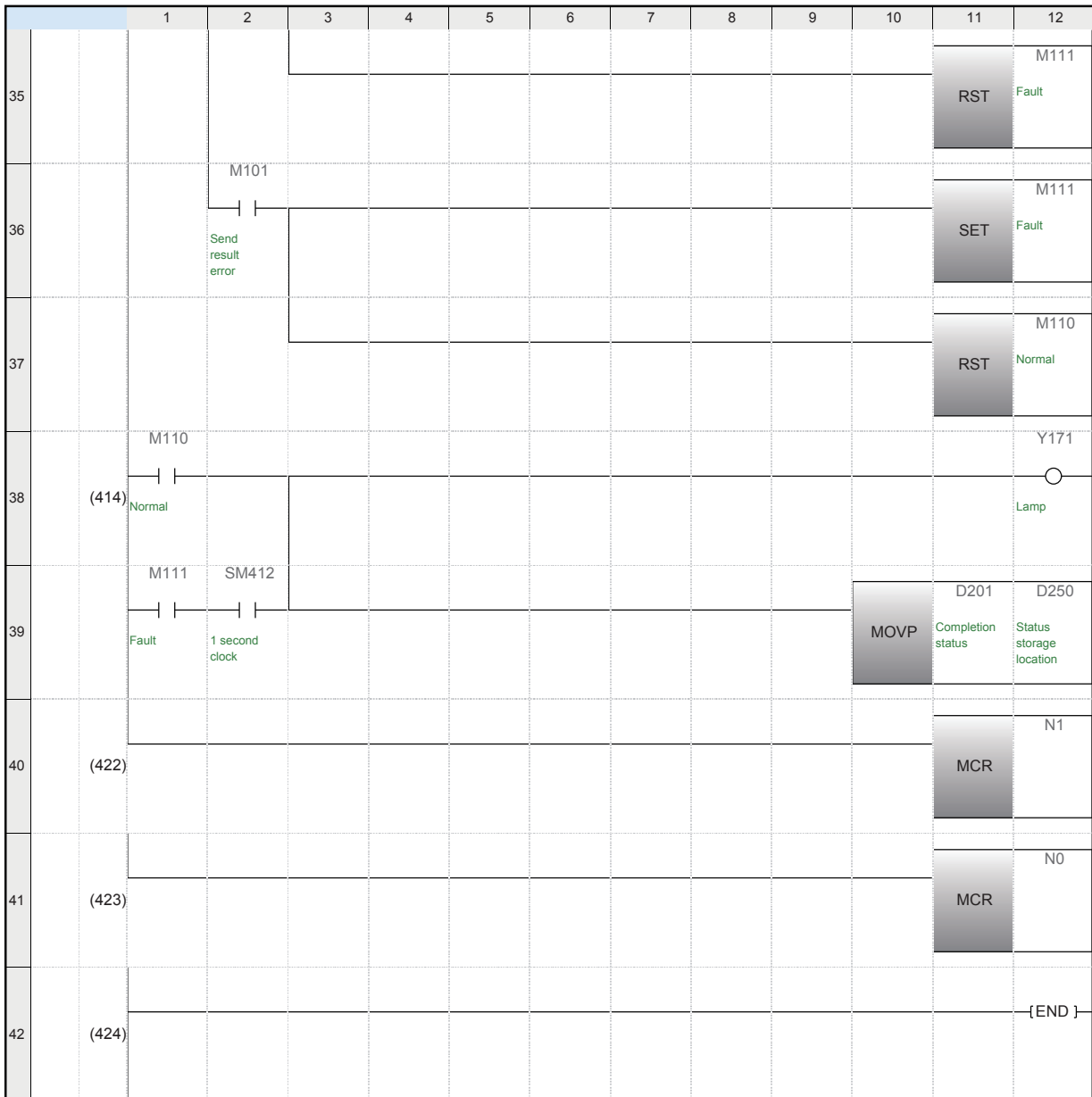
■Program for the normal station (station No.2)

Project name	1Ns2 (transient transmission (SEND_RECV))

Own station status

```
(0)   SB20      SB47       SB49                                              ┌─────┐  N0    M0
      ─┤/├──────┤/├────────┤/├─────────────────────────────────────────────│ MC  │
      Module    Baton      Data link                                        └─────┘
      status    pass       status of                                       Master control
                status of  own
                own station station

      N0─┐ M0
         └─
```

Other stations status

```
(41)  SW0A0.0   SW0B0.0                                                     ┌─────┐  N1    M1
      ─┤/├──────┤/├───────────────────────────────────────────────────────│ MC  │
      Baton     Cyclic                                                      └─────┘
      pass      transmission                                               Master control
      status of status of
      each      each station
      station

      N1─┐ M1
         └─
```

Data reception

```
(84)  SB30      SM411                                                                    Y171
      ─┤├───────┤├─────────────────────────────────────────────────────────────────────( )
      RECV      0.2 second                                                               Lamp
      instruction clock
      execution
      request flag (1)

(103) X103      SB30                                                        ┌─────┐  M200
      ─┤├───────┤├────────────────────────────────────────────────────────│ SET │
      Switch    RECV                                                        └─────┘
                instruction                                                 Control
                execution                                                   data
                request flag (1)                                            setting
                                                                            flag
```

Control data setting

```
                                                                           Execution/error completion type
(106) M200                                                                  ┌─────┐  H80    D300
      ─┤├────────────────────────────────────────────────────────────────│ MOV │
      Control                                                              └─────┘  Start
      data                                                                          device for
      setting                                                                       storing
      flag                                                                          control data
```

```
                                                                           Own station storage channel
                                                                            ┌─────┐  K1     D302
                                                                           │ MOV │
                                                                            └─────┘
```

```
                                                                           Arrival monitoring time
                                                                            ┌─────┐  K2     D308
                                                                           │ MOV │
                                                                            └─────┘
```

	1	2	3	4	5	6	7	8	9	10	11	12
19											SET	M201 RECV instruction execution flag
20											RST	M200 Control data setting flag

	1	2	3	4	5	6	7	8	9	10	11	12
22 (224)	M201 ─┤ ├─ RECV instruction execution flag							JP.RECV	J1	D300 Start device for storing control data	D350 Start device for storing receive data	M210 Receive completion device
23 (262)	M210 ─┤ ├─ Receive completion device	M211 ─┤/├─ Receive result error									RST	M201 RECV instruction execution flag
24 (265)											MCR	N1
25 (266)											MCR	N0
26 (267)	X107 ─┤ ├─ Switch									MOV	D350 Start device for storing receive data	D1
27 (270)												{END}

4

Operation method

1. Set the RUN/STOP/RESET switch of the CPU modules of both the control station and normal station to the "RESET" position (for approximately one second) to reset the CPU modules. Then, set it to the "RUN" position.

2. Setting the send data (sending side: 1Mp1)

Set the send data to the initial input device (D20) and turn on X100 to store the send data in D101.

3. Checking the send data setting (sending side: 1Mp1)

Check the send data (D101) using the initial indication device (D0).

4. Sending the data (sending side: 1Mp1)

Turn on X101.

When sending data completes successfully, Y171 turns on. When sending data completes with an error, Y171 flashes.

5. Checking data reception and reading the receive data (receiving side: 1Ns2)

When the data is received, Y171 flashes.

After checking that the data has been received, turn on X103 to read the data.

When the data has been read, Y171 turns off.

6. Displaying the receive data (receiving side: 1Ns2)

Turn on X107 and display the receive data by the initial indication device (D1) to check.

4.2 Access to Other Stations

Connect a peripheral to the programmable controller and access other stations.

The same functions (such as reading, writing, and monitoring of sequence programs; turning on and off the device of sequence programs; network diagnostics; and module diagnostics) as those for access to the own station can be used even when other stations are accessed.
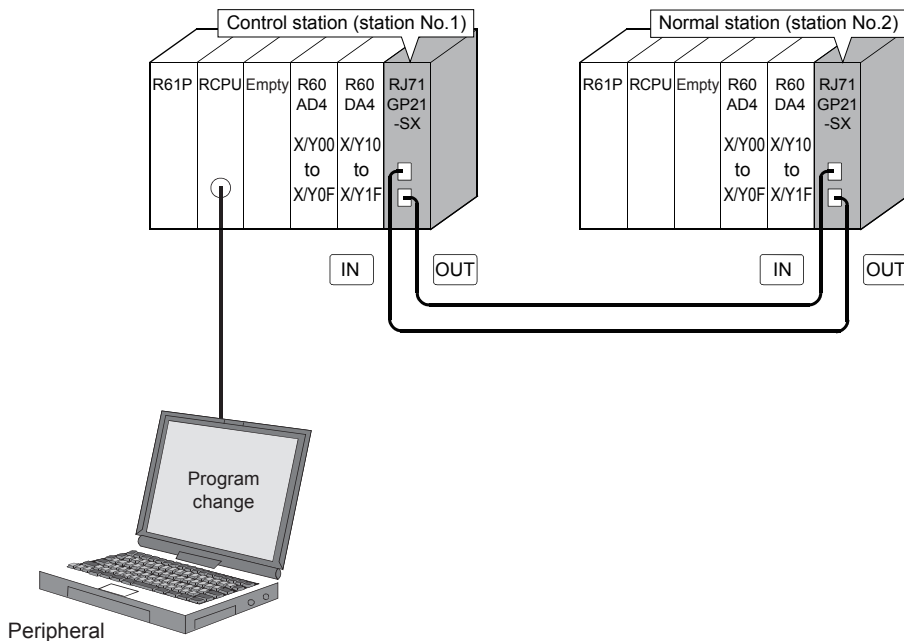
Operating procedure
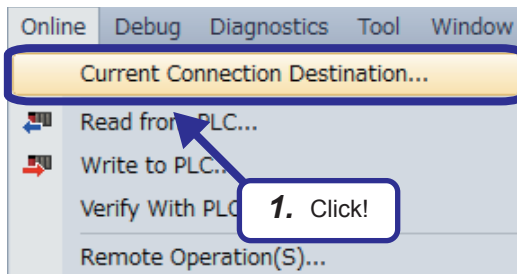
1. Select [Online] ⇨ [Current Connection Destination] from the menu of the engineering tool.

(To the next page)

(From the previous page)
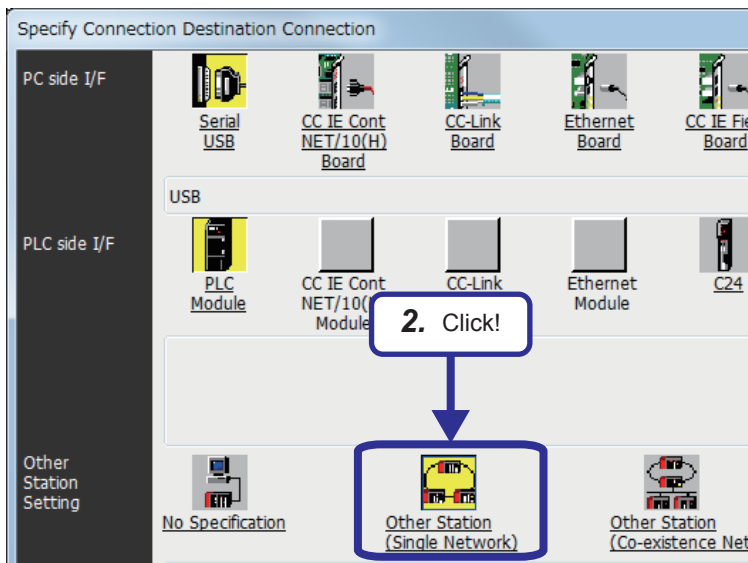
2. The "Specify Connection Destination Connection" dialog box appears. Click [Other Station (Single Network)] in [Other Station Setting].
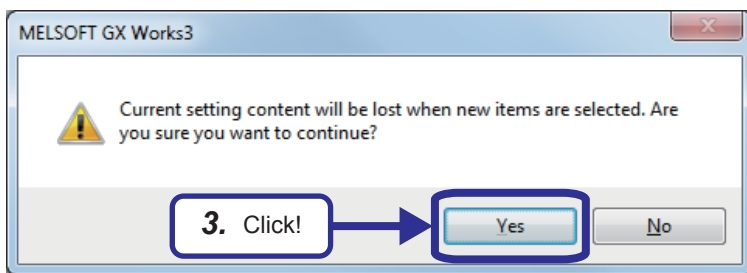
2. Click!

3. The confirmation message appears. Click the [Yes] button.

MELSOFT GX Works3

Current setting content will be lost when new items are selected. Are you sure you want to continue?

3. Click! → Yes   No
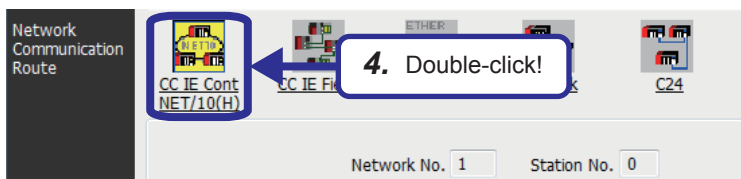
4. Double-click [CC IE Cont NET/10(H)] in [Network Communication Route].

4. Double-click!

Network No. 1   Station No. 0

(To the next page)

Network Communication Route Detailed Setting of CC IE Control,NET/10(H)

Network No.	1
Station No.	2

OK
Cancel
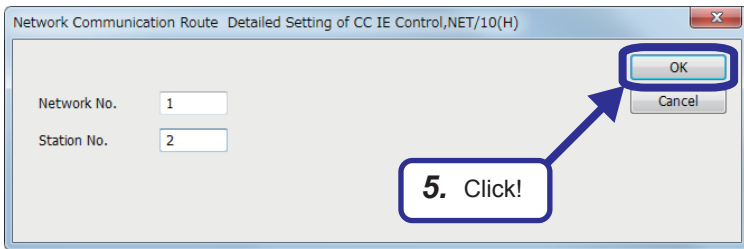
5. Click!

5. Set the network number and station number of the access destination. Click the [OK] button.

4

Network Communication Route

CC IE Cont NET/10(H) CC IE Field Ethernet CC-Link C24

Network No. 1   Station No. 2
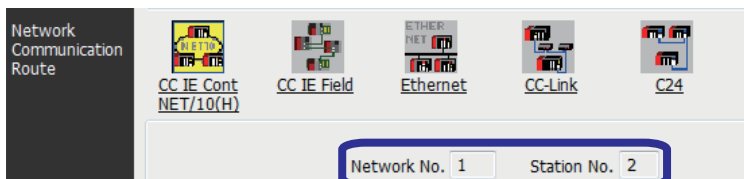
6. Check that the network number and station number have been changed.

Accessing Other Station

Target System

Multiple CPU Setting
1 2 3 4   Target PLC Not Specified

7. Click!

OK
Cancel

7. Click the [OK] button.

Station No.
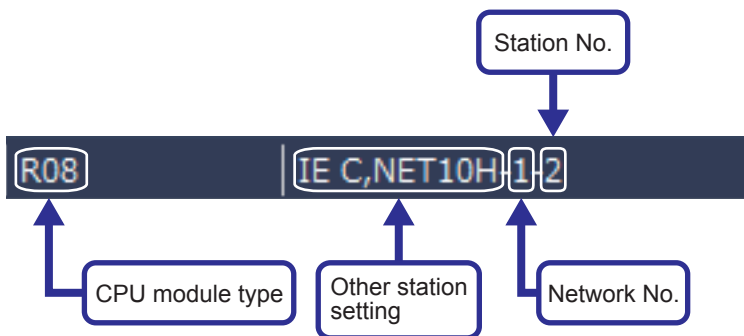
8. The display of the bottom of the window is changed as shown on the left.

R08   IE C,NET10H 1 2

CPU module type   Other station setting   Network No.

Online Debug Diagnostics Tool Windo

Current Connection Destination...

Read from PLC...

Write to PLC...

Verify With P...

Remote Operation(S)...

9. Click!
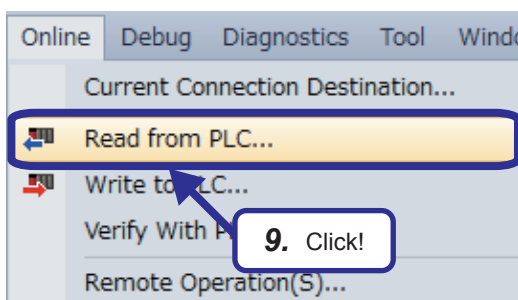
9. Select [Online] ⇨ [Read from PLC] from the menu of the engineering tool and read parameters and programs.

MEMO

5 EXERCISE III (ROUTING FUNCTION)

5.1 Routing Function

The user can set any communication route to perform transient transmission to stations in different networks. This setting can be used when the system has a network module which does not support dynamic routing or when it is necessary to clearly specify a communication route.

Relay station		Destination station
Network No.	Station No.	Network No.
●	■	▲
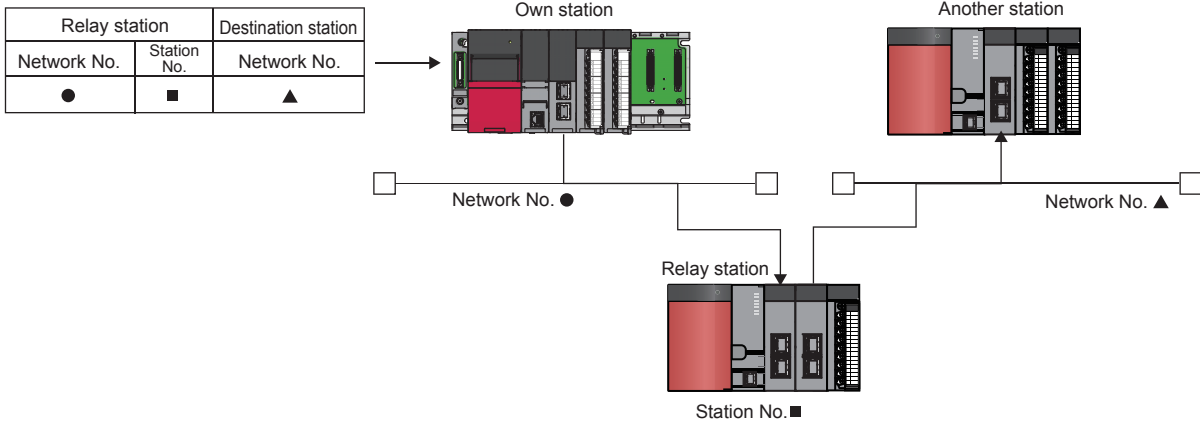
5.2 Demonstration Machine System

Mount network modules of the demonstration machine and connect optical fiber cables as follows.
Write parameters and sequence programs to each station and check the operation.
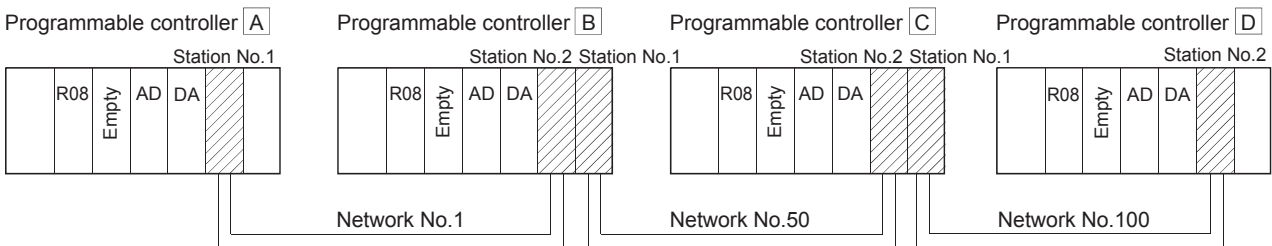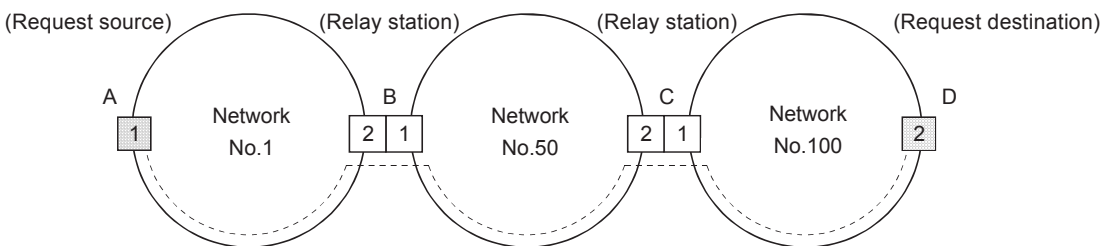
5.3 Checking with Programs

Read the D100 current value of the station No.2 (D) of the network No.100 by using the READ instruction of the station No.1 (A) of the network No.1, and display the read value with D10.

5.3.1 Reading/writing word devices on another station (READ/WRITE)

Use the transient function and the READ/WRITE instructions to read/write data on the same network or another network.

JP.READ, GP.READ

RnCPU RnENCPU RnPCPU RnSFCPU (Standard) RnSFCPU (Safety)

These instructions read data from a device in the programmable controller of another station (in units of words).

Ladder	ST
─────[⌐:⌐]─(J/U)─(s1)─(s2)─(d1)─(d2)───────	ENO:=JP_READ(EN,J,s1,s2,d1,d2); ENO:=GP_READ(EN,U,s1,s2,d1,d2);

FBD/LD
┌─ ⌐:⌐ ─┐ ─ EN   ENO ─ ─ J/U   d1 ─ ─ s1   d2 ─ ─ s2
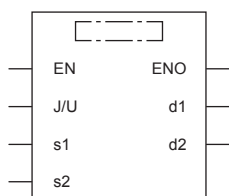
■Execution condition

Instruction	Execution condition
JP.READ GP.READ	┌─

Setting data

■Description, range, data type

Operand		Description	Range	Data type	Data type (label)
(J/U)	JP.READ	(J): Own station network number	1 to 239	16-bit unsigned binary	ANY16
	GP.READ	(U): Start I/O number (first three digits in four-digit hexadecimal representation) of own station or own node	00H to FEH	16-bit unsigned binary	ANY16
(s1)		Own station start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(s2)		Target station start device where the data to be read is stored	—	String[*2]	ANYSTRING_SINGLE[*2]
(d1)		Own station start device (a continuous area for the length of the read data) for storing the data that has been read	—	Device name	ANY16[*1]
(d2)		Own station device to be turned on one scan when the instruction completes. (d2)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN		Execution condition	—	Bit	BOOL
ENO		Execution result	—	Bit	BOOL

*1   When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

*2   For the specifications of the string data to be specified, refer to the following.
     📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks)

JP.WRITE, GP.WRITE

RnCPU RnENCPU RnPCPU RnSFCPU (Standard) RnSFCPU (Safety) ✖

These instructions write data to a device in the programmable controller of another station (in units of words).

Ladder	ST
─┤ ▢:▢ ├─ (J/U) (s1) (s2) (d1) (d2) ─	ENO:=JP_WRITE(EN,J,s1,s2,d1,d2); ENO:=GP_WRITE(EN,U,s1,s2,d1,d2);

FBD/LD
▢:▢ EN   ENO J/U   d2 s1 s2 d1

■Execution condition

Instruction	Execution condition
JP.WRITE GP.WRITE	⌐‾

Setting data

■Description, range, data type

Operand		Description	Range	Data type	Data type (label)
(J/U)	JP.WRITE	(J): Own station network number	1 to 239	16-bit unsigned binary	ANY16
	GP.WRITE	(U): Start I/O number (first three digits in four-digit hexadecimal representation) of own station or own node	00H to FEH	16-bit unsigned binary	ANY16
(s1)		Own station start device where control data is stored	Refer to the control data.	Device name	ANY16[1]
(s2)		Own station start device containing write data	—	Device name	ANY16[1]
(d1)		Target station start device to which data is to be written	—	String[2]	ANYSTRING_SINGLE[2]
(d2)		Own station device to be turned on one scan when the instruction completes. (d2)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN		Execution condition	—	Bit	BOOL
ENO		Execution result	—	Bit	BOOL

*1   When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

*2   For the specifications of the string data to be specified, refer to the following.
     📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks)

5.3.2   Setting parameters with GX Works3

Set the module parameters as follows.

For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Required Settings

• Programmable controller A (request source)

Item	Setting
⊟ *Station Type*	
Station Type	Control Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Station No.	1
⊟ **Network Range Assignment**	
Network Range Assignment Setting	<Detailed Setting>

• Programmable controller B (relay station)

Module 1 (normal station)

Item	Setting
⊟ *Station Type*	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	2

Module 2 (control station)

Item	Setting
⊟ *Station Type*	
Station Type	Control Station
⊟ **Network Number**	
Network Number	50
⊟ **Station Number**	
Station No.	1
⊟ **Network Range Assignment**	
Network Range Assignment Setting	<Detailed Setting>

• Programmable controller C (relay station)

Module 1 (normal station)

Item	Setting
⊟ *Station Type*	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	50
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	2

Module 2 (control station)

Item	Setting
⊟ *Station Type*	
Station Type	Control Station
⊟ **Network Number**	
Network Number	100
⊟ **Station Number**	
Station No.	1
⊟ **Network Range Assignment**	
Network Range Assignment Setting	<Detailed Setting>

• Programmable controller D (request destination)

Item	Setting
Station Type	
Station Type	Normal Station
Network Number	
Network Number	100
Station Number	
Setting Method	Parameter Editor
Station No.	2

■Network Range Assignment setting (common to all control stations)

Total No. of Stations: 2   Switch Windows: LB/LW Setting (1)   Batch Setting(G)

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station							No Setting	Disable	
2	Normal Station							No Setting	Disable	

■Refresh Setting

• Programmable controller A (request source)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF	
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF	

• Programmable controller B (relay station)

Module 1 (normal station)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF	
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF	

Module 2 (control station)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00200	003FF	
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00200	003FF	

• Programmable controller C (relay station)

Module 1 (normal station)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF	
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF	

Module 2 (control station)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00200	003FF	
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00200	003FF	

• Programmable controller D (request destination)

No.	Link Side						CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF	
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF	

5.3.3 Sequence program

The following shows the sequence program of each station.

In these programs, the link error detection program is omitted.

Program for the programmable controller A (request source)

Project name	A (routing)

		1	2	3	4	5	6	7	8	9	10	11	12
1	Control data setting												
2											Error completion type		
3	(0)	X100 ↑									MOV	H81	D110
4											Own station channel		
5											MOV	K1	D112
6											Target station CPU module type		
7											MOV	H0	D113
8											Target network No.		
9											MOV	K100	D114
10											Target station No.		
11											MOV	K2	D115
12											Number of resends		
13											MOV	K5	D117
14											Arrival monitoring time		
15											MOV	K2	D118
16											Read data length		
17											MOV	K1	D119
18	READ instruction execution to programmable controller D												
19	(218)	X100 ↑						JP.READ	J1	D110	"D100"	D100	M10
20	(289)	SM400 Always On									MOV	D100	D10
21	(292)												[END]

Program for the programmable controller D (request destination)

	Project name	D (routing)

		1	2	3	4	5	6	7	8	9	10	11	12
1	Data for the READ instruction of programmable controller A												
2	(0)	X101 ─┤├─									MOVP	D20	D100
3	(64)	SM400 ─┤├─ Always On									MOV	D100	D0
4	(67)												─[END]─
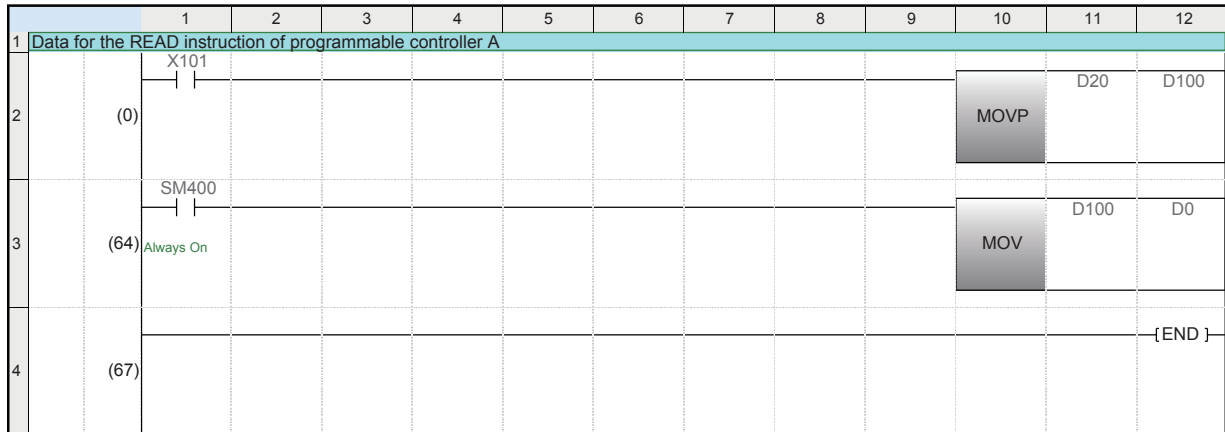
5.4 Communication Test

This test checks whether the communication path for transient transmission from the own station to the communication target is correct or not.

Executing the communication test

Operating procedure
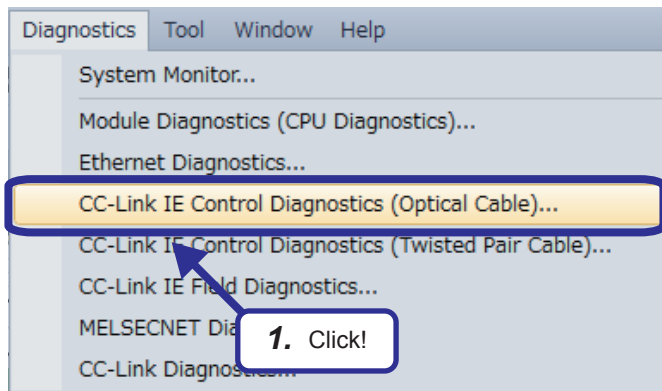
1. Click [Diagnostics] ⇨ [CC-Link IE Control Diagnostics (Optical Cable)] from the menu of the engineering tool.
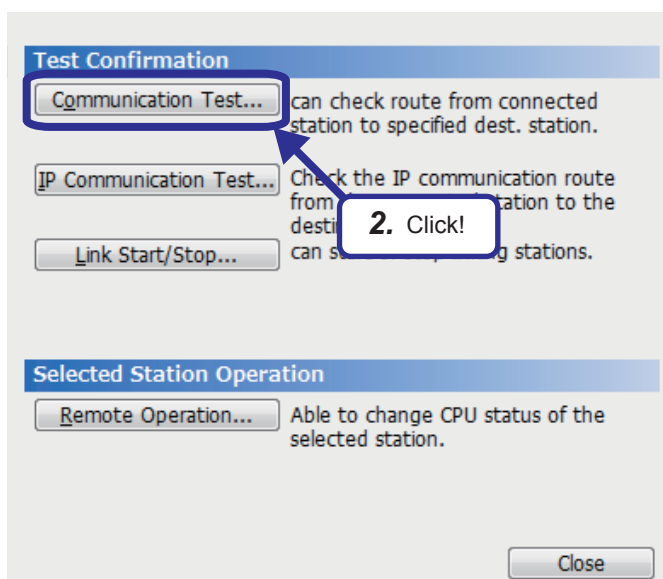
2. Click the [Communication Test] button.

(To the next page)

(From the previous page)
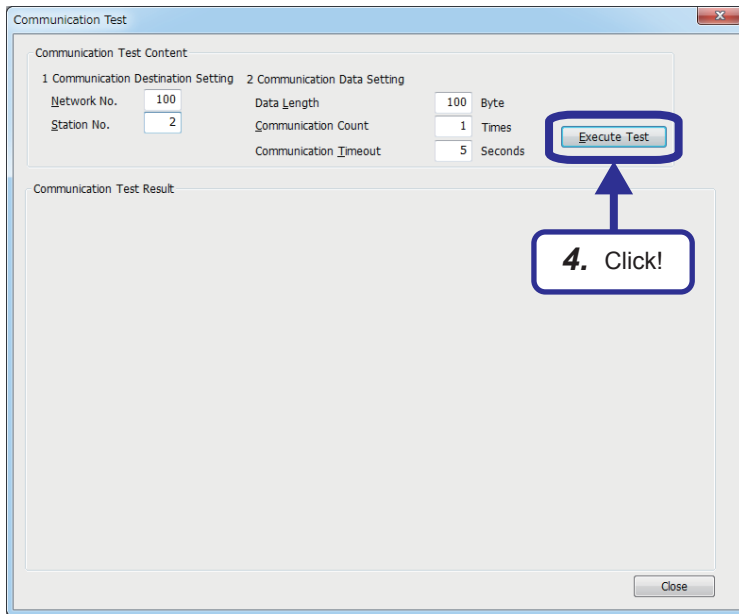
3. Set the communication test as shown on the left.

1 Communication Destination Setting:
Network No.: 100
Station No.: 2

2 Communication Data Setting:
Data Length: 100 Byte
Communication Count: 1 Times
Communication Timeout: 5 Seconds

4. Click the [Execute Test] button.
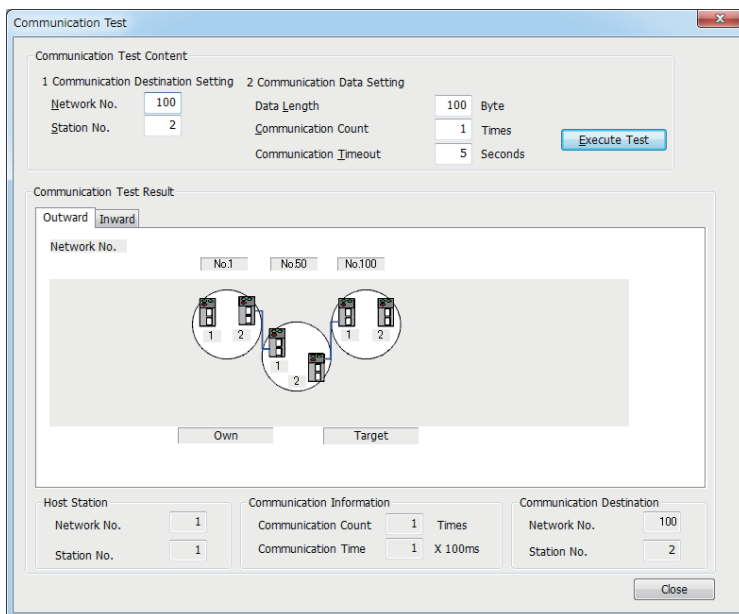
5. Communication test results are displayed.

5.5 Communicating with Different Networks Under the Configuration Including Modules Other Than MELSEC iQ-R Series

Setting communication paths in the routing setting allows communications with networks including modules other than MELSEC iQ-R series.

Setting method

The user must specify the following: The network number and the station number of the own network (relay station) which will be passed through to another network, and the network number of the final arrival network (destination station). Up to 238 routing settings can be specified.

👆 [CPU Parameter] ⇨ "Routing Setting"

Window

No.	Relay Station		⇨	Target Station
---	Network Number	Station No.		Network Number
1				
2				
3				
4				

Displayed items

Item		Description	Setting range	Default
Relay Station	Network Number	Sets the network number of the first relay station to pass through to the destination station.	1 to 239	—
	Station No.	Sets the station number of the first relay station to pass through to the destination station.	0 to 120	—
Target Station	Network Number	Sets the network number of the final arrival network.	1 to 239	—

> **Point**
>
> The S(P).RTWRITE instruction can be used to temporary change or add a routing setting during operation. (The setting made by the S(P).RTWRITE instruction is cleared when the CPU module is powered off or reset.) Also, the S(P).RTREAD instruction can be used to read setting details of the parameters. For details on these instructions, refer to the following.
>
> 📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks)

5 EXERCISE III (ROUTING FUNCTION)

5 - 10   5.5 Communicating with Different Networks Under the Configuration Including Modules Other Than MELSEC iQ-R Series

Setting example

The following figure shows an example of the routing setting.

Ex.

Transient transmission from the request source (Network No.1) to the destination (Network No.3) via network No.2

| (1) Network No.1 Station No.1 | (2) Network No.1 Station No.3 | (3) Network No.2 Station No.1 | (4) Network No.2 Station No.6 | (5) Network No.3 Station No.7 | (6) Network No.3 Station No.1 |

Request source — Relay station — Relay station 2 — Destination station

Network No.1 — Network No.2 — Network No.3
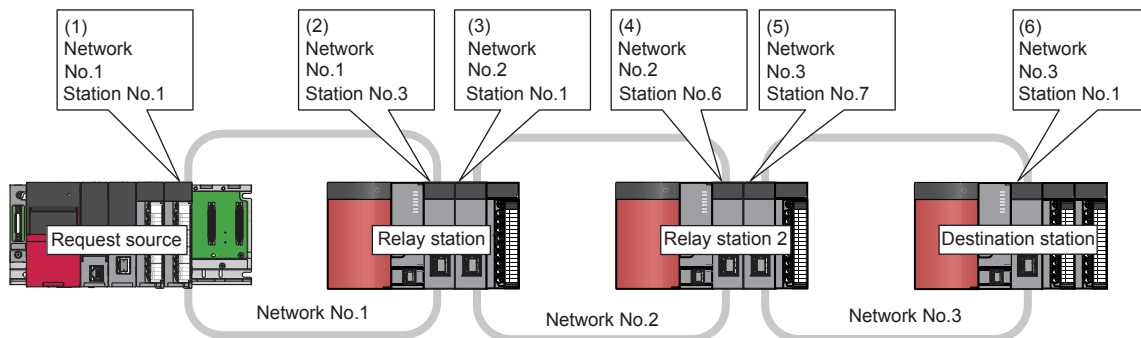
Station	Request route	Response route
Request source	(1)	(1)
	Relay station / Network No. 1 / Station No. 3 — **Destination station** / Network No. 3	
	The data is transferred to the relay station of the own network (2) to be transferred to the network No.3.	
Relay station 1	(2) (3)	(2) (3)
	Relay station / Network No. 2 / Station No. 6 — **Destination station** / Network No. 3	The data has been transferred to the network No.1, and is to be transferred to (1).
	The data is transferred to the relay station of the own network (4) to be transferred to the network No.3.	
Relay station 2	(4) (5)	(4) (5)
		Relay station / Network No. 2 / Station No. 1 — **Destination station** / Network No. 1
	The data has been transferred to the network No.3, and is to be transferred to (6).	The data is transferred to the relay station of the own network (3) to be transferred to the network No.1.
Destination station	(6)	
		Relay station / Network No. 3 / Station No. 7 — **Destination station** / Network No. 1
		The data is transferred to the relay station of the own network (5) to be transferred to the network No.1.

5

Precaution

Observe the following precaution on the routing setting:

• For the multiple CPU system configuration, the same routing setting must be used for all the CPU modules.

Point

If the network is configured in a loop as shown in the figure below, set the same relay stations on the way from the request source to the request destination and on the way back from the request destination to the request source.

Do not set the route that goes around the loop. The first relay station on the way back to the request source is determined to that has been used on the way to the request destination. Therefore, sending data to a new relay station results in an error.

A is the route from the request source to the request destination.
B and C are the routes from the request destination to the request source.
Do not set a route like C.
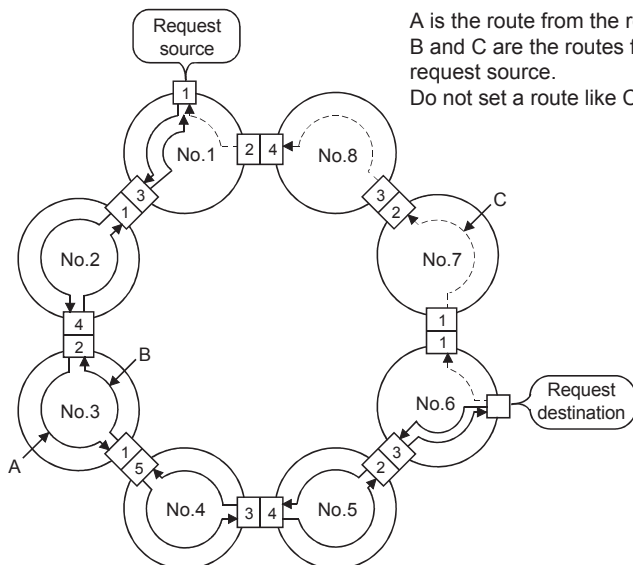
Since transient transmission to remote networks by setting the routing parameters passes through many networks, factors such as transmission data amount and the number of transmissions affect the entire system. For example, the link scan time may be temporarily extended or the transient transmission may delay in the own network due to the transient transmission from other networks in the network No.2 to No.5 of the above network system.

To use the routing parameters, design the system configuration considering the entire system.

Configuration with only MELSEC iQ-R series

Users do not need to set the routing setting for the configuration with only MELSEC iQ-R series. For details, refer to Page 1 - 20 When the networks consist of only MELSEC iQ-R series.

5.6 Multi-network (Interlink Transmission)

5.6.1 Interlink transmission

This function transfers the link device (LB, LW) data of a CC-Link IE Controller Network-equipped module to another network module at a relay station.

Set the interlink transmission in "Interlink Transmission Settings" in "Application Settings".
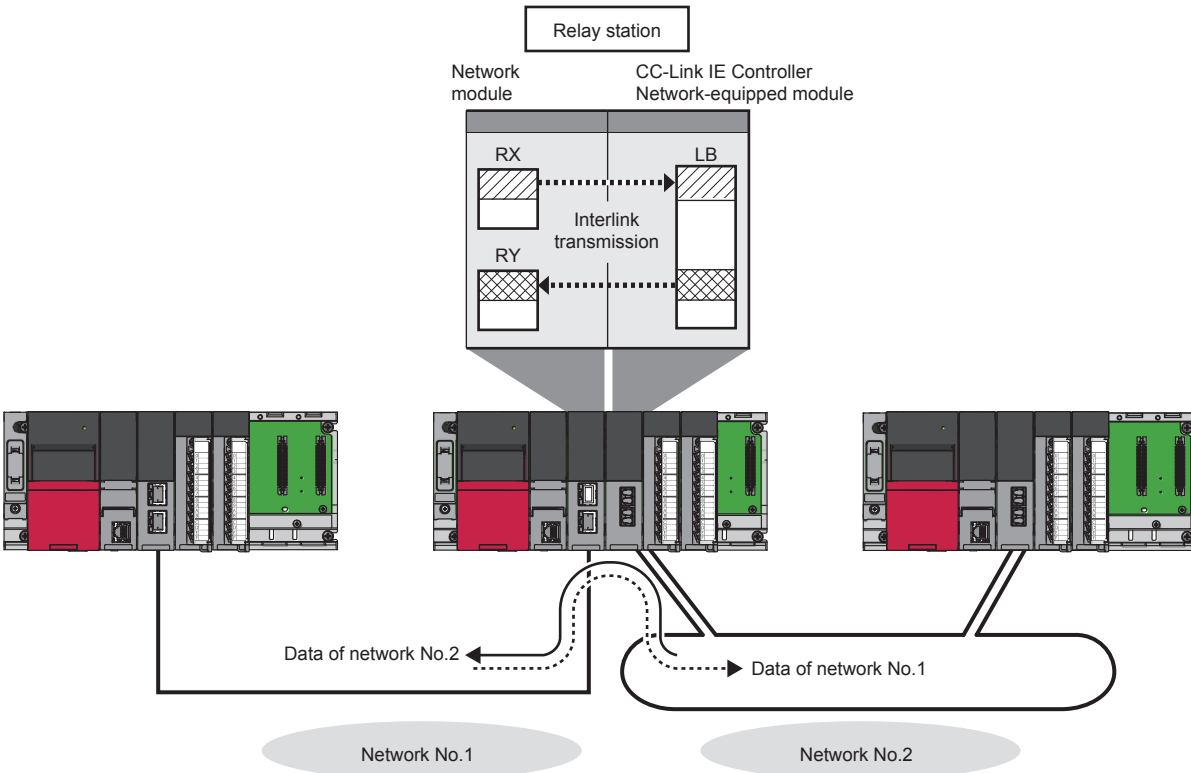
5.6.2 Demonstrations of multi-network (interlink transmission)

Perform communications using the cyclic transmission in a multi-network system.

Transfer data using the interlink transmission between networks.

Change the configuration of the demonstration machines as follows. Write parameters and sequence programs to each station and check the operation.
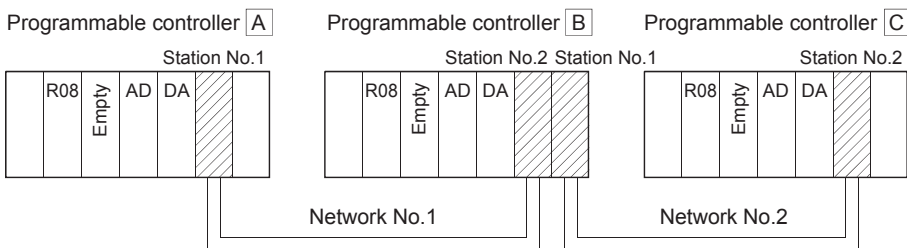
Setting parameters with GX Works3

Set the module parameters as follows.

For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Required Settings

• Programmable controller A

Item	Setting
⊟ **Station Type**	
Station Type	Control Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Station No.	1
⊟ **Network Range Assignment**	
Network Range Assignment Setting	\<Detailed Setting\>

• Programmable controller B

Module 1 (normal station)

Item	Setting
⊟ **Station Type**	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	2

Module 2 (control station)

Item	Setting
⊟ **Station Type**	
Station Type	Control Station
⊟ **Network Number**	
Network Number	2
⊟ **Station Number**	
Station No.	1
⊟ **Network Range Assignment**	
Network Range Assignment Setting	\<Detailed Setting\>

• Programmable controller C

Item	Setting
⊟ **Station Type**	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	2
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	2

■Network Range Assignment setting (programmable controller A/B, and module 2 (control station))

Total No. of Stations: 2   Switch Windows: LB/LW Setting (1)   Batch Setting(G)

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station	256	0000	00FF	256	00000	000FF	No Setting	Disable	
2	Normal Station	256	0100	01FF	256	00100	001FF	No Setting	Disable	

■Refresh Setting

• Programmable controller A

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB	512	00000	001FF	⬄	Specify Device	SB	512	00000	001FF
–	SW	512	00000	001FF	⬄	Specify Device	SW	512	00000	001FF
1	LB	512	00000	001FF	⬄	Specify Device	B	512	00000	001FF
2	LW	512	00000	001FF	⬄	Specify Device	W	512	00000	001FF

• Programmable controller B

Module 1 (normal station)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB	512	00000	001FF	⬄	Specify Device	SB	512	00000	001FF
–	SW	512	00000	001FF	⬄	Specify Device	SW	512	00000	001FF
1	LB	256	00000	000FF	⬄	Specify Device	B	256	00000	000FF
2	LW	256	00000	000FF	⬄	Specify Device	W	256	00000	000FF

Module 2 (control station)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB	512	00000	001FF	⬄	Specify Device	SB	512	00200	003FF
–	SW	512	00000	001FF	⬄	Specify Device	SW	512	00200	003FF
1	LB	256	00100	001FF	⬄	Specify Device	B	256	01100	011FF
2	LW	256	00100	001FF	⬄	Specify Device	W	256	01100	011FF

• Programmable controller C

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB	512	00000	001FF	⬄	Specify Device	SB	512	00000	001FF
–	SW	512	00000	001FF	⬄	Specify Device	SW	512	00000	001FF
1	LB	512	00000	001FF	⬄	Specify Device	B	512	01000	011FF
2	LW	512	00000	001FF	⬄	Specify Device	W	512	01000	011FF

■Interlink transmission setting (only for the programmable controller B)

👉 [Application Settings] ⇨ [Interlink Transmission Settings]

• Transfer source module 0030: RJ71GP21-SX (normal station), transfer destination module 0050: RJ71GP21-SX (control station)

Transfer Source Module: 0030:RJ71GP21-SX(Normal Station)
Transfer Destination Module: 0050:RJ71GP21-SX(Control Station)
Setting Method: Start/End

No.	LB/LB						LW/LW					
	Source			Destination			Source			Destination		
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
1	256	0000	00FF	256	0000	00FF	256	00000	000FF	256	00000	000FF

• Transfer source module 0050: RJ71GP21-SX (control station), transfer destination module 0030: RJ71GP21-SX (normal station)

Transfer Source Module: 0050:RJ71GP21-SX(Control Station)
Transfer Destination Module: 0030:RJ71GP21-SX(Normal Station)
Setting Method: Start/End

No.	LB/LB						LW/LW					
	Source			Destination			Source			Destination		
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
1	256	0100	01FF	256	0100	01FF	256	00100	001FF	256	00100	001FF

Sequence program

The following shows the sequence program of each station.

In these programs, the link error detection program is omitted.

■Program for the programmable controller A

Project name	A multi-network (interlink transmission)

	1	2	3	4	5	6	7	8	9	10	11	12
1	Send to programmable controller C											
2	(0)	X102 ─| |─										B0 ◯ Send to programmable controller B
3	Reception from programmable controller C											
4	(37)	B100 ─| |─ Reception from programmable controller B										Y170 ◯
5	(81)												─{END }─
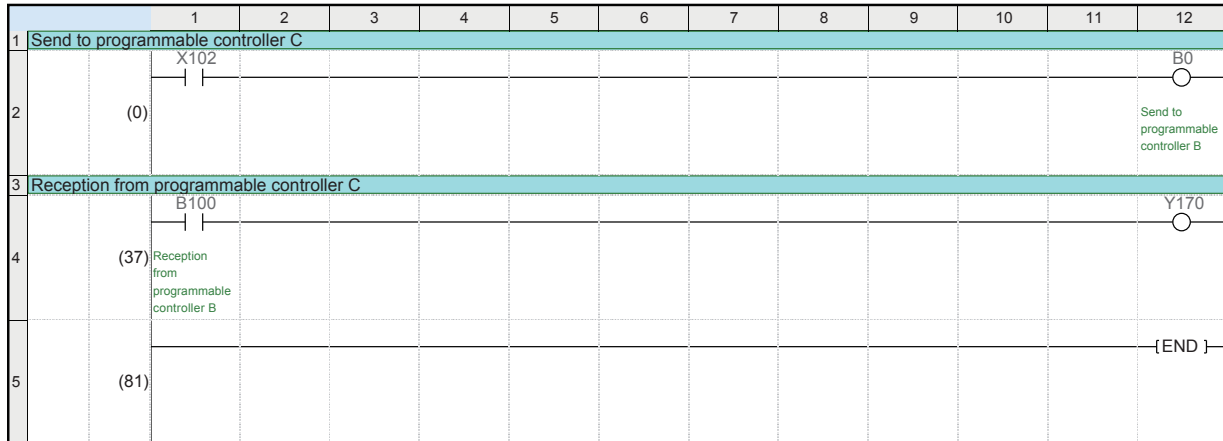
■Program for the programmable controller B

Project name	B multi-network (interlink transmission)

	1	2	3	4	5	6	7	8	9	10	11	12
1	The network No.1 is automatically replaced with the network No.2.											
2	The network No.2 is automatically replaced with the network No.1.											
3	(0)												─{END }─
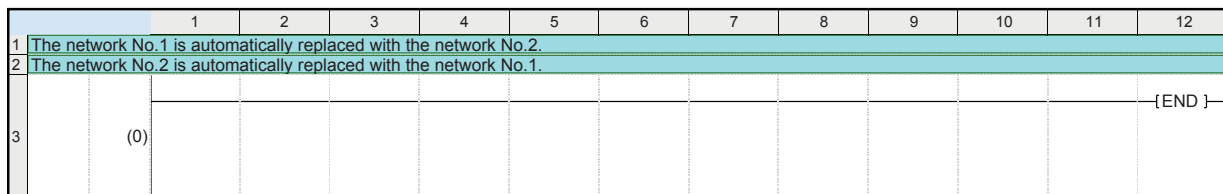
■Program for the programmable controller C

Project name	C multi-network (interlink transmission)

	1	2	3	4	5	6	7	8	9	10	11	12
1	Reception from programmable controller A											
2	(0)	B1000 ─| |─ Reception from programmable controller B										Y170 ◯
3	Send to programmable controller A											
4	(44)	X102 ─| |─										B1100 ◯ Send to programmable controller B
5	(81)												─{END }─
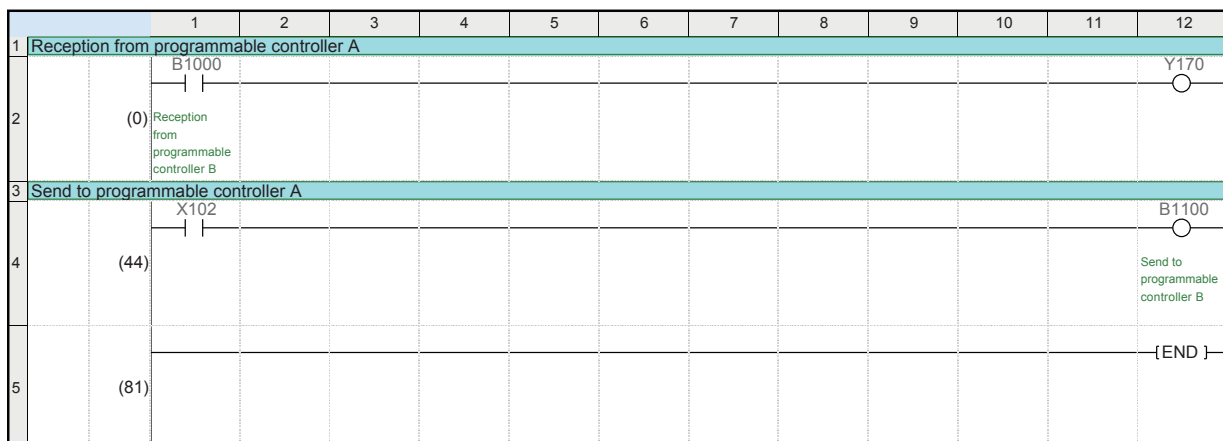
Operation method

1. Sending data from the programmable controller A to the programmable controller C

Turn on X102 of the programmable controller A and check that Y170 of the programmable controller C turns on.

2. Sending data from the programmable controller C to the programmable controller A

Turn on X102 of the programmable controller C and check that Y170 of the programmable controller A turns on.

APPENDICES

Appendix 1　Specifications Comparison and Compatibility of Network Modules

Specifications comparison list of CC-Link IE and MELSECNET/H

This section describes the specifications comparison between CC-Link IE and MELSECNET/H.

The network topology of CC-Link IE Controller Network (RJ71GP21-SX) is an optical duplex loop connection. The network topology of CC-Link IE Controller Network (RJ71EN71 and RnENCPU) is a line, star, or ring.

When a coaxial bus system is used in MELSECNET/H, consider replacing the system to an optical duplex loop connection or a line, star, or ring topology.

The following table lists the specifications comparison between CC-Link IE and MELSECNET/H.

■Specifications comparison table of CC-Link IE and MELSECNET/H

Specifications item		Selected mode	
		CC-Link IE (RJ71GP21-SX)	MELSECNET/H (QJ71LP21-25, QJ71LP21S-25)
Maximum number of link points per network	Input and output (LX, LY)	8192 points	8192 points
	Link relay (LB)	32768 points	16384 points
	Link register (LW)	131072 points	16384 points
Maximum number of link points per station	Input and output (LX, LY)	8192 points	$\{(LY + LB)\} \div 8 + (2 \times LW)\} \leq 2000$ bytes For the MELSECNET/H extended mode: $\{(LY + LB) \div 8 + (2 \times LW)\} \leq 35840$ bytes
	Link relay (LB)	16384 points	
		Extended mode: 32768 points	
	Link register (LW)	16384 points	
		Extended mode: 131072 points	
Transient transmission capacity		1920 bytes maximum	
Communication speed		1Gbps	25Mbps/10Mbps
Number of connectable stations per network		120 stations (control station: 1, normal station: 119)	64 stations (control station: 1, normal station: 63)
Connection cable		Optical fiber cable that meets the 1000BASE-SX standard: Multimode optical fiber (GI)	Optical fiber cable
Link scan time		The link scan time and transmission delay time differ between CC-Link IE and MELSECNET/H. Check the link scan time and transmission delay time of CC-Link IE when a MELSECNET/H system is replaced with a CC-Link IE system.	
Transmission delay time			
Overall cable distance		66000m (when 120 stations are connected and the outside diameter of the core is 50μm) 33000m (when 120 stations are connected and the outside diameter of the core is 62.5μm)	30000m
Station-to-station distance		550m (when the outside diameter of the core is 50μm) 275m (when the outside diameter of the core is 62.5μm)	200 to 2000m
Maximum number of networks		239	
Maximum number of groups		32	
Network topology		Duplex loop	
32-bit data assurance		Supported	Supported
Station-based block data assurance		Supported[1]	Supported
Maximum number of refresh parameter settings (except for SB and SW)		256 per module	64 per module
External dimensions		106 (H) × 27.8 (W) × 110 (D) [mm]	• QJ71LP21-25: 98 (H) × 27.4 (W) × 90 (D) [mm] • QJ71LP21S-25: 98 (H) × 55.2 (W) × 90 (D) [mm]
Weight		0.18kg	• QJ71LP21-25: 0.11kg • QJ71LP21S-25: 0.20kg

*1　The data assurance function is not supported for the direct access to link devices.

A

Appendix 2 Differences Between RJ71GP21-SX and QJ71LP21/QJ71LP21-25/QJ71LP21S-25/QJ71BR11

Differences such as LED indicators and switch settings

Although the CC-Link IE Controller Network module (RJ71GP21-SX) has an LED indicator as well as the MELSECNET/H network modules (QJ71LP21, QJ71LP21-25, QJ71LP21S-25, and QJ71BR11) have, there are differences between each network module as shown in the following table. Check the differences before operation.

Item	Model	
	RJ71GP21-SX	**QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71BR11**
LED indicator	RUN	
	PRM	MNG
	—	T.PASS
	D LINK	D.LINK
	SD/RD	SD
	—	RD
	ERR.[1]	ERR.[1]
	—	L ERR.[1]
Station number setting switch	—	STATION NO. ×10, ×1
Mode setting switch	No switch is provided. Diagnostic functions are set in network parameters.	MODE 0: Online[2] (Parameters are valid.) 1: Self-loopback test 2: Internal self-loopback test 3: Hardware test 4: Online[3] 5: Self-loopback test[3] 6: Internal self-loopback test[3] 7: Hardware test[3] 8 and later: Use prohibited
Applicable CPU module	RCPU	QCPU
Applicable base unit	R3□B, R6□B	Q3□B, Q6□B
External dimensions (H × W × D (mm))	106 (Base unit mounting side: 98)× 27.8 × 110	Except for QJ71LP21S-25: 98 × 27.4 × 90 QJ71LP21S-25: 98 × 55.2 × 90
Weight (kg)	0.18	Except for QJ71LP21S-25: 0.11 QJ71LP21S-25: 0.20

*1 Error details can be checked by executing network diagnostics.

*2 Set this value in network parameters.

*3 These values can be set with the QJ71LP21-25 and QJ71LP21S-25 only. When the QJ71LP21 or QJ71BR11 is used, these values are use prohibited.

Precautions

The following are the precautions on replacing a MELSECNET/H network system with a CC-Link IE Controller Network system.

■Optical fiber cable

・Applicable optical fiber cable type

The optical fiber cable for MELSECNET/H modules cannot be used for CC-Link IE Controller Network modules.

・Station-to-station distance

The station-to-station distance for CC-Link IE Controller Network modules is a maximum of 550m (when the outside diameter of the core is 50μm) or 275m (when the outside diameter of the core is 62.5μm).

If the distance is longer than the maximum distance, adjust the distance so that it will not exceed the maximum distance.

■Setting using the switches of the MELSECNET/H module

For CC-Link IE Controller Network modules, use network parameters instead of the switches.

■Utilizing network parameters

When "Station Type" is changed with GX Works3, the set data is deleted.

When utilizing network parameters, copy the setting using a text editor before changing "Station Type".

To copy the setting, select [Edit] → [Copy] from the menu of GX Works3.

> **Point**
>
> There are ranges to which cutting/copying/pasting network parameters is allowed and not allowed.

A

Appendix 3   List of Link Special Relay (SB) Areas

The link special relay (SB) is turned on/off depending on various factors during data link. Any error status of the data link can be checked by using or monitoring it in the program.

Application of the link special relay (SB)

By using the link special relay (SB), the status of CC-Link IE Controller Network can be checked from HMI (Human Machine Interfaces) as well as the engineering tool.

Refresh of the link special relay (SB)

To use the link special relay (SB), set them in "Refresh Setting" in "Basic Settings" so that they are refreshed to the devices or labels of the CPU module.

Mounting multiple network modules

The link special relay (SB) of each network module is refreshed by the link special relay (SB) of the CPU module shown below when the refresh parameters of each network module remain default.

Item	Module 1	Module 2	Module 3	Module 4
Device No.	SB0000 to SB01FF	SB0200 to SB03FF	SB0400 to SB05FF	SB0600 to SB07FF

Ranges turned on/off by users and by the system

The following ranges correspond to when the link special relay (SB) areas are assigned from SB0000 to SB01FF.
- Turned on/off by users: SB0000 to SB001F
- Turned on/off by the system: SB0020 to SB01FF

List of link special relay (SB) areas

The following table lists the link special relay (SB) areas when they are assigned from SB0000 to SB01FF.

Point

> Do not turn on or off areas whose numbers are not on the following list. Doing so may cause malfunction of the programmable controller system.

No.	Name	Description	Availability	
			Control station	Normal station
SB0000	Link startup of own station	Starts cyclic transmission of the own station. Off: Startup not requested On: Startup requested (valid at rising edge) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. • For SB0000 to SB0003, only one of the areas can be turned on.	○	○
SB0001	Link stop of own station	Stops cyclic transmission of the own station. Off: Stop not requested On: Stop requested (valid at rising edge) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. • For SB0000 to SB0003, only one of the areas can be turned on.	○	○
SB0002	System link startup	Starts cyclic transmission of the entire system. The station where cyclic transmission is started is specified in 'Link startup/stop direction' (SW0000) and 'Link startup/stop station specification' (SW0001 to SW0008). Off: Startup not requested On: Startup requested (valid at rising edge) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. • For SB0000 to SB0003, only one of the areas can be turned on.	○	○
SB0003	System link stop	Stops cyclic transmission of the entire system. The station where cyclic transmission is stopped is specified in 'Link startup/stop direction' (SW0000) and 'Link startup/stop station specification' (SW0001 to SW0008). Off: Stop not requested On: Stop requested (valid at rising edge) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. • For SB0000 to SB0003, only one of the areas can be turned on.	○	○
SB0007	■When optical fiber cables are used Clear IN-side transmission error count	Clears the IN-side line error detection area (SB006E, SB0140, SW0068, SW0069, SW0074, SW0140 to SW0147) to 0. Off: Clear not requested On: Clear requested (valid while on)	○	○
	■When Ethernet cables are used Clear PORT1 transmission error count	Clears the P1-side line error detection area (SB006E, SB0140, SW0068, SW0069, SW0074, SW0120 to SW0127, SW0140 to SW0147) to 0. Off: Clear not requested On: Clear requested (valid while on)	○	○
SB0008	■When optical fiber cables are used Clear OUT-side transmission error count	Clears the OUT-side line error detection area (SB006F, SB0150, SW006A, SW006B, SW0084, SW0150 to SW0157) to 0. Off: Clear not requested On: Clear requested (valid while on)	○	○
	■When Ethernet cables are used Clear PORT2 transmission error count	Clears the P2-side line error detection area (SB006F, SB0150, SW006A, SW006B, SW0084, SW0130 to SW0137, SW0150 to SW0157) to 0. Off: Clear not requested On: Clear requested (valid while on)	○	○
SB0009	■Only when optical fiber cables are used Clear loop switching count	Clears the path switching detection area of the own station (SB008E, SB0160, SW006E, SW0160 to SW0167) and Transmission path switching history (Un\G2784 to Un\G2945) to 0. Off: Clear not requested On: Clear requested (valid while on)	○	○
SB000A	Clear transient transmission error count	Clears the transient transmission error area of the own station (SB008F, SB0170, SW006F, SW0170 to SW0177) and Transient transmission error log (Un\G2592 to Un\G2753) to 0. Off: Clear not requested On: Clear requested (valid while on)	○	○
SB000C	■Only when optical fiber cables are used Normal connection information refresh instruction	Refreshes (update) the normal connection information of the own station. Off: No refresh request On: Refresh requested (valid at rising edge) If executed with the conditions for normal connection information acquisition not satisfied, the normal connection information is cleared.	○	○
SB0020	Communication status with the CPU module	Stores the communication status between a CC-Link IE Controller Network-equipped module and a CPU module. Off: Normal On: Error	○	○

A

No.	Name	Description	Availability	
			Control station	Normal station
SB0030	RECV execution request flag CH1	Stores the data reception status of own station channel 1. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0031	RECV execution request flag CH2	Stores the data reception status of own station channel 2. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0032	RECV execution request flag CH3	Stores the data reception status of own station channel 3. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0033	RECV execution request flag CH4	Stores the data reception status of own station channel 4. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0034	RECV execution request flag CH5	Stores the data reception status of own station channel 5. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0035	RECV execution request flag CH6	Stores the data reception status of own station channel 6. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0036	RECV execution request flag CH7	Stores the data reception status of own station channel 7. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0037	RECV execution request flag CH8	Stores the data reception status of own station channel 8. Off: No data received On: Data received (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on, data prior to error is held.	○	○
SB0040	Network type of own station	Stores the network type of the own station Off: Controller Network	○	○
SB0043	Module operation mode of own station	Stores the module operation mode of the own station. Off: Online On: Other than online	○	○
SB0044	Station setting of own station	Stores the station type of the own station. Off: Normal station On: Control station	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0047	Baton pass error status of own station	Stores the baton pass status (transient transmission availability) of the own station. Off: Normal On: Error When this relay is turned on, the cause of the error can be checked with 'Baton pass status of own station' (SW0047) and 'Cause of baton pass interruption' (SW0048). Depending on the link refresh timing, the update of 'Baton pass status of own station' (SW0047) and 'Cause of baton pass interruption' (SW0048) may be offset by one sequence scan.	○	○
SB0048	Station status of own station	Stores the station type (current status) of the own station. Off: Normal station On: Control station (when SB0044 is turned on)/sub-control station (when SB0044 is turned off) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0049	Data link error status of own station	Stores the data link status of the own station. Off: Normal On: Error When this relay is turned on, the cause of the error can be checked with 'Cause of data link stop' (SW0049). Depending on the link refresh timing, the update of 'Cause of data link stop' (SW0049) may be offset by one sequence scan.	○	○
SB004A	CPU minor error status of own station	Stores the minor error occurrence status of the CPU module on the own station. Off: No minor error On: Minor error	○	○
SB004B	CPU moderate/major error status of own station	Stores the moderate/major error occurrence status of the CPU module on own station. Off: No moderate/major error On: Moderate/major error	○	○
SB004C	Link startup request accept status of own station	Stores the acceptance status of 'Link startup of own station' (SB0000). Off: Not accepted (SB0000 is off.) On: Accepted (SB0000 is on.) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB004D	Link startup completion status of own station	Stores the status of link startup processing requested with 'Link startup of own station' (SB0000). Off: Link startup not completed (SB0000, SB0050 are off.) On: Link startup completed (SB0000, SB0050 are on.) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB004E	Link stop request accept status of own station	Stores the acceptance status of 'Link stop of own station' (SB0001). Off: Not accepted (SB0001 is off.) On: Accepted (SB0001 is on.) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB004F	Link stop completion status of own station	Stores the link stop processing status requested with 'Link stop of own station' (SB0001). Off: Not completed (SB0001, SB0052 are off.) On: Completed (SB0001, SB0052 are on.) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0050	System link startup request accept status	Stores the acceptance status of 'System link startup' (SB0002). Off: Not accepted (SB0002 is off.) On: Accepted (SB0002 is on.) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SB0051	System link startup completion status	Stores the status of link startup processing requested with 'System link startup' (SB0002). Off:　Not completed (SB0002, SB0054 are off.) On:　Completed (SB0002, SB0054 are on.) (Conditions) ・This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. 　When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0052	System link stop request accept status	Stores the acceptance status of 'System link stop' (SB0003). Off:　Not accepted (SB0003 is off.) On:　Accepted (SB0003 is on.) (Conditions) ・This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. 　When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0053	System link stop completion status	Stores the status of link stop processing requested with 'System link stop' (SB0003). Off:　Not completed (SB0003, SB0056 are off.) On:　Completed (SB0003, SB0056 are on.) (Conditions) ・This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. 　When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0054	Parameter reception status	Stores the status of parameter reception. For the control station, this relay stores the status of parameter reception from the CPU module. For the normal station, this relay stores the status of parameter reception from the control station. Off:　Reception completed On:　Reception not completed	○	○
SB0055	Received parameter error	Stores the status of received parameter. (Own parameter status is stored for the control station.) Off:　Parameters normal On:　Parameter error	○	○
SB0056	Communication status	Stores the transient transmission status. Off:　Transient transmission by the control station On:　Transient transmission by the sub-control station (Conditions) ・This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. 　When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB005A	Parameter type of control station	Stores the station type (mode) of the control station. Off:　Control station On:　Extended mode (control station)	○	○
SB005B	CPU operating status of own station	Stores the operating status of the CPU module on the own station. Off:　RUN On:　STOP, PAUSE, or moderate/major error	○	○
SB005C	Block 1 I/O master station	Stores the I/O master station settings status of block 1 (LX/LY setting (1)). Off:　No setting On:　Set When this relay is turned on, the station number is stored in 'Block 1 I/O master station' (SW005C). (Conditions) ・This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SB005D	Block 2 I/O master station	Stores the I/O master station settings status of block 2 (LX/LY setting (2)). Off:　No setting On:　Set When this relay is turned on, the station number is stored in 'Block 2 I/O master station' (SW005D). (Conditions) ・This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SB005E	CPU type of own station	Stores the CPU type of the own station. Off:　RCPU	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0060	Constant link scan status	Stores the constant link scan status. Off: No constant link scan time setting On: Set (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SB0061	Cyclic transmission punctuality assurance	Stores the status of cyclic transmission punctuality assurance. Off: Not assured On: Assured (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SB0064	■When optical fiber cables are used Loop status of own station	Stores the transmission path status of the own station. When this relay is turned on, the error definition can be checked with 'Loop status of own station' (SW0064). Off: Normal On: Error (Conditions) • 'Loop status of own station' (SW0064) is turned on except when a value other than 00H is set.	○	○
	■When Ethernet cables are used Connection status of own station	Stores the transmission path status of the own station. When this relay is turned on, the error definition can be checked with 'Connection status of own station' (SW0064). Off: Normal On: Error (Conditions) • 'Connection status of own station' (SW0064) is turned on except when the status is normal and loopback is being performed.	○	○
SB0065	Loopback status	■When optical fiber cables are used Stores the loopback status for the loopback function. The station number of the loopback station can be checked with 'IN-side loopback station number' (SW0070) and 'OUT-side loopback station number' (SW0080). Off: Normal (no loopback stations) On: Loopback being performed (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
		■When Ethernet cables are used Stores the loopback status for the loopback function. The station number of the loopback station can be checked with 'Loopback station number 1' (SW0070) and 'Loopback station number 2' (SW0080). Off: Normal (no loopback stations) On: Loopback being performed (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0066	■When optical fiber cables are used IN-side link-up status of own station	Stores the IN-side link-up status of the own station. Off: Link-up On: Link-down	○	○
	■When Ethernet cables are used PORT1 link-up status of own station	Stores the P1-side link-up status of the own station. Off: Link-up On: Link-down	○	○
SB0067	■When optical fiber cables are used OUT-side link-up status of own station	Stores the OUT-side link-up status of the own station. Off: Link-up On: Link-down	○	○
	■When Ethernet cables are used PORT2 link-up status of own station	Stores the P2-side link-up status of the own station. Off: Link-up On: Link-down	○	○

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No.	Name	Description	Availability	
			Control station	**Normal station**
SB0068	■When optical fiber cables are used IN-side link establishing status of own station	Stores the IN-side link establishing status of the own station. Off: Link establishment completed On: Link establishing	○	○
	■When Ethernet cables are used PORT1 link establishing status of own station	Stores the P1-side link establishing status of the own station. Off: Link establishment completed On: Link establishing	○	○
SB0069	■When optical fiber cables are used OUT-side link establishing status of own station	Stores the OUT-side link establishing status of the own station. Off: Link establishment completed On: Link establishing	○	○
	■When Ethernet cables are used PORT2 link establishing status of own station	Stores the P2-side link establishing status of the own station. Off: Link establishment completed On: Link establishing	○	○
SB006A	■Only when optical fiber cables are used IN-side cabling status of own station	Stores the IN-side cabling status of the own station. Off: Normal On: Inserted incorrectly	○	○
SB006B	■Only when optical fiber cables are used OUT-side cabling status of own station	Stores the OUT-side cabling status of the own station. Off: Normal On: Inserted incorrectly	○	○
SB006C	■When optical fiber cables are used IN-side current error frame reception status of own station	Stores whether the error frame is currently received at the IN side of the own station. Off: Not received On: Currently receiving	○	○
	■When Ethernet cables are used PORT1 current error frame reception status of own station	Stores whether the error frame is currently received at the P1 side of the own station. Off: Not received On: Currently receiving	○	○
SB006D	■When optical fiber cables are used OUT-side current error frame reception status of own station	Stores whether the error frame is currently received at the OUT side of the own station. Off: Not received On: Currently receiving	○	○
	■When Ethernet cables are used PORT2 current error frame reception status of own station	Stores whether the error frame is currently received at the P2 side of the own station. Off: Not received On: Currently receiving	○	○
SB006E	■When optical fiber cables are used IN-side error frame detection of own station	Stores whether the error frame was received at the IN side of the own station from power-on to the present. Off: Not received On: Received When 'Clear IN-side transmission error count' (SB0007) is turned on, the stored value is cleared.	○	○
	■When Ethernet cables are used PORT1 error frame detection of own station	Stores whether the error frame was received at the P1 side of the own station from power-on to the present. Off: Not received On: Received When 'Clear PORT1 transmission error count' (SB0007) is turned on, the stored value is cleared.	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB006F	■When optical fiber cables are used OUT-side error frame detection of own station	Stores whether the error frame was received at the OUT side of the own station from power-on to the present. Off: Not received On: Received When 'Clear OUT-side transmission error count' (SB0008) is turned on, the stored value is cleared.	○	○
	■When Ethernet cables are used PORT2 error frame detection of own station	Stores whether the error frame was received at the P2 side of the own station from power-on to the present. Off: Not received On: Received When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored value is cleared.	○	○
SB0070	Station number setting status of own station	Stores the station number setting status. Off: Station number set On: Station number not set (When the station number is set by the parameters, this relay is always off.)	×	○
SB0078	■Only when Ethernet cables are used Network topology setting	Stores the setting status of "Network Topology" in "Basic Settings" for the own station (control station). Off: Line topology, star topology, or coexistence of star and line topologies On: Ring topology	○	○
SB007F	IP address setting status	Stores the status of the IP address setting by parameter. Off: No setting On: Set For normal stations, this relay stores the reception status of an IP address from the control station.	○	○
SB008E	■Only when optical fiber cables are used Path switching detection flag	Stores the path switching detection status. Off: Path switching not detected On: Path switching detected When 'Clear loop switching count' (SB0009) is turned on, the stored value is cleared.	○	○
SB008F	Transient error	Stores the transient transmission error detection status. Off: Error not detected On: Error detected When this relay is turned on, the number of errors can be checked with 'Transient transmission error count' (SW006F).	○	○
SB0098	■Only when Ethernet cables are used Network configuration mismatch occurrence status	Stores the match or mismatch status of the actual network configuration and the network map of the CC-Link IE Controller Network diagnostics. Off: Match On: Mismatch After return or addition of the normal station, SB0098 may be turned on regardless of the actual match/mismatch status.	○	×
SB0099	■Only when Ethernet cables are used Number of connected modules over occurrence status	Stores whether the number of normal stations connected is 119 or less, or 120 or more. Off: 119 or less On: 120 or more Number of connected modules is the total of the normal stations which are currently connected and the disconnected stations (normal stations which were previously connected).	○	×
SB00A0	Baton pass error status of each station	Stores the baton pass status of each station. Off: All stations normal On: Faulty station exists When this relay is turned on, the status of each station can be checked with 'Baton pass status of each station' (SW00A0 to SW00A7). Depending on the link refresh timing, the update of 'Baton pass status of each station' (SW00A0 to SW00A7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SB00B0	Data link error status of each station	Stores the data link status of each station. Off: All stations normal On: Faulty station exists When this relay is turned on, the status of each station can be checked with 'Data link status of each station' (SW00B0 to SW00B7). Depending on the link refresh timing, the update of 'Data link status of each station' (SW00B0 to SW00B7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. • Reserved stations and stations higher than the maximum station number are ignored.	○	○
SB00C0	Reserved station setting status	Stores whether a reserved station is set. Off: No setting On: Set When this relay is turned on, the status of each station can be checked with 'Reserved station setting status' (SW00C0 to SW00C7). Depending on the link refresh timing, the update of 'Reserved station setting status' (SW00C0 to SW00C7) may be offset by one sequence scan. (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SB00D0	Parameter communication status of each station	Stores the parameter communication status of each station. Off: Parameter communication is completed or not executed in all stations On: Station where parameter communication is in execution exists When this relay is turned on, the status of each station can be checked with 'Parameter communication status of each station' (SW00D0 to SW00D7). Depending on the link refresh timing, the update of 'Parameter communication status of each station' (SW00D0 to SW00D7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.	○	×
SB00E0	Parameter error status of each station	Stores the parameter error status of each station. Off: All stations normal On: Faulty station exists When this relay is turned on, the status of each station can be checked with 'Parameter error status of each station' (SW00E0 to SW00E7). Depending on the link refresh timing, the update of 'Parameter error status of each station' (SW00E0 to SW00E7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.	○	×
SB00F0	CPU operating status of each station	Stores the operating status of the CPU module on each station. (Including own station) Off: All stations are at RUN or STEP-RUN state On: Station at STOP or PAUSE state, or station with a moderate/major error exists. When this relay is turned on, the status of each station can be checked with 'CPU operating status of each station' (SW00F0 to SW00F7). Depending on the link refresh timing, the update of 'CPU operating status of each station' (SW00F0 to SW00F7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0100	CPU moderate/major error status of each station	Stores the moderate/major error occurrence status of the CPU module on each station. Off: No moderate/major error On: Station with a moderate/major error exists When this relay is turned on, the status of each station can be checked with 'CPU moderate/major error status of each station' (SW0100 to SW0107). Depending on the link refresh timing, the update of 'CPU moderate/major error status of each station' (SW0100 to SW0107) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0110	CPU minor error status of each station	Stores the minor error occurrence status of the CPU module on each station. Off: All stations normal or station with a moderate/major error exists. On: Station with a minor error exists. When this relay is turned on, the status of each station can be checked with 'CPU minor error status of each station' (SW0110 to SW0117). Depending on the link refresh timing, the update of 'CPU minor error status of each station' (SW0110 to SW0117) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0120	■When optical fiber cables are used IN-side current error frame reception status of each station	Stores whether the error frame is currently received at the IN side of each station. Off: Not received at all stations On: Error frame is being received at one or more stations. When this relay is turned on, the status of each station can be checked with 'IN-side current error frame reception status of each station' (SW0120 to SW0127). Depending on the link refresh timing, the update of 'IN-side current error frame reception status of each station' (SW0120 to SW0127) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
	■When Ethernet cables are used PORT1 current error frame reception status of each station	Stores whether the error frame is currently received at the P1 side of each station. Off: Not received at all stations On: Error frame is being received at one or more stations. When this relay is turned on, the status of each station can be checked with 'PORT1 current error frame reception status of each station' (SW0120 to SW0127). Depending on the link refresh timing, the update of 'PORT1 current error frame reception status of each station' (SW0120 to SW0127) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0130	■When optical fiber cables are used OUT-side current error frame reception status of each station	Stores whether the error frame is currently received at the OUT side of each station. Off: Not received at all stations On: Error frame is being received at one or more stations. When this relay is turned on, the status of each station can be checked with 'OUT-side current error frame reception status of each station' (SW0130 to SW0137). Depending on the link refresh timing, the update of 'OUT-side current error frame reception status of each station' (SW0130 to SW0137) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
	■When Ethernet cables are used PORT2 current error frame reception status of each station	Stores whether the error frame is currently received at the P2 side of each station. Off: Not received at all stations On: Error frame is being received at one or more stations. When this relay is turned on, the status of each station can be checked with 'PORT2 current error frame reception status of each station' (SW0130 to SW0137). Depending on the link refresh timing, the update of 'PORT2 current error frame reception status of each station' (SW0130 to SW0137) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SB0140	■When optical fiber cables are used IN-side error frame detection status of each station	Stores the status that has received an error frame from power-on until the present at the IN side of each station. Off: Not received at all stations On: Error frame has been received at one or more stations. When this relay is turned on, the status of each station can be checked with 'IN-side error frame detection status of each station' (SW0140 to SW0147). Depending on the link refresh timing, the update of 'IN-side error frame detection status of each station' (SW0140 to SW0147) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
	■When Ethernet cables are used PORT1 error frame detection of each station	Stores whether the error frame was received at the P1 side of each station from power-on to the present. Off: Not received at all stations On: Error frame has been received at one or more stations. When this relay is turned on, the status of each station can be checked with 'PORT1 error frame detection of each station' (SW0140 to SW0147). Depending on the link refresh timing, the update of 'PORT1 error frame detection of each station' (SW0140 to SW0147) may be offset by one sequence scan. When 'Clear PORT1 transmission error count' (SB0007) is turned on, the stored value is cleared. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0150	■When optical fiber cables are used OUT-side error frame detection status of each station	Stores the status that has received an error frame from power-on until the present at the OUT side of each station. Off: Not received at all stations On: Error frame has been received at one or more stations. When this relay is turned on, the status of each station can be checked with 'OUT-side error frame detection status of each station' (SW0150 to SW0157). Depending on the link refresh timing, the update of 'OUT-side error frame detection status of each station' (SW00150 to SW0157) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
	■When Ethernet cables are used PORT2 error frame detection of each station	Stores whether the error frame was received at the P2 side of the station No.0 from power-on to the present. Off: Not received at all stations On: Error frame has been received at one or more stations. When this relay is turned on, the status of each station can be checked with 'PORT2 error frame detection of each station' (SW0150 to SW0157). Depending on the link refresh timing, the update of 'PORT2 error frame detection of each station' (SW00150 to SW0157) may be offset by one sequence scan. When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored value is cleared. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0160	■Only when optical fiber cables are used Path switching detection flag of each station	Stores the detection status of path switching of each station. (Including own station) Off: Path switching not detected On: Path switching detected When this relay is turned on, the status of each station can be checked with 'Path switching detection status of each station' (SW0160 to SW0167). Depending on the link refresh timing, the update of 'Path switching detection status of each station' (SW0160 to SW0167) may be offset by one sequence scan. The path switching detection status is cleared when 'Clear loop switching count' (SB0009) is turned on. The stored value is cleared when 'Clear loop switching count' (SB0009) is turned on in each station and path switching detection status for all stations is cleared. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○

No.	Name	Description	Availability Control station	Availability Normal station
SB0170	Transient error of each station	Stores the transient transmission error detection status for all stations. (Including own station) Off: Error not detected On: Error detected When this relay is turned on, the status of each station can be checked with 'Transient error detection status of each station' (SW0170 to SW0177). Depending on the link refresh timing, the update of 'Transient error detection status of each station' (SW0170 to SW0177) may be offset by one sequence scan. The transient error detection status of the own station is cleared when 'Clear transient transmission error count' (SB000A) is turned on. The stored value is cleared when 'Clear transient transmission error count' (SB000A) is turned on in each station and the transient error detection status for all stations is cleared. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0180	External power supply information of each station	Stores the external electrical supply status of the CC-Link IE Controller Network module for each station. (Including own station) Off: No external power supplied to any station On: External power supplied to station(s) When this relay is turned on, the status of each station can be checked with 'External power supply status of each station' (SW0180 to SW0187). Depending on the link refresh timing, the update of 'External power supply status of each station' (SW0180 to SW0187) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB0190	External power supply error information of each station	Stores the external power supply error status of the CC-Link IE Controller Network module with external power supply function on each station. (Including own station) Off: All stations normal or no stations providing external power supply On: Faulty station exists When this relay is turned on, the status of each station can be checked with 'External power supply error status of each station' (SW0190 to SW0197). Depending on the link refresh timing, the update of 'External power supply error status of each station' (SW0190 to SW0197) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB01A0	Group cyclic transmission station information	Stores shared group setting information on the stations. (Including own station) Off: Station in shared group different from the own station not exist. On: Station in shared group different from the own station exists. When this relay is turned on, the status of each station can be checked with 'Group cyclic transmission station information' (SW01A0 to SW01A7). Depending on the link refresh timing, the update of 'Group cyclic transmission station information' (SW01A0 to SW01A7) may be offset by one sequence scan.	○	○
SB01B0	CPU type information of each station	Stores the CPU type information of each station. (Including own station) Off: No basic model QCPU or safe CPU On: Basic model QCPU or safe CPU present When this relay is turned on, the status of each station can be checked with 'CPU type information of each station' (SW01B0 to SW01B7). Depending on the link refresh timing, the update of 'CPU type information of each station' (SW01B0 to SW01B7) may be offset by one sequence scan.	○	○
SB01C0	Redundant system information	Stores the redundant system information of each station. (Including own station) Off: No redundant system station On: Redundant system station exists. When this relay is turned on, the status of each station can be checked with 'Redundant function information of each station' (SW01C0 to SW01C7). Depending on the link refresh timing, the update of 'Redundant function information of each station' (SW01C0 to SW01C7) may be offset by one sequence scan.	○	○

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No.	Name	Description	Availability	
			Control station	**Normal station**
SB01D0	Separate-mode station exists information	Stores the CPU operation mode status of each station. (Including own station) Off: No separate mode station (including stand-alone system) On: Separate mode station exists. When this relay is turned on, the status of each station can be checked with 'Separate mode status of each station' (SW01D0 to SW01D7). Depending on the link refresh timing, the update of 'Separate mode status of each station' (SW01D0 to SW01D7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB01E0	Pairing-set station exists information	Stores the pairing setting status of each station. (Including own station) Off: No pairing-set station On: Pairing-set station exists. When this relay is turned on, the status of each station can be checked with 'Pairing setting status of each station' (SW01E0 to SW01E7). Depending on the link refresh timing, the update of 'Pairing setting status of each station' (SW01E0 to SW01E7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SB01F0	Station of standby system exists information	Stores the CPU operation status (control/standby system) of each station. (Including own station) Off: No standby system CPU station (including stand-alone system) On: Station of standby system CPU exists. When this relay is turned on, the status of each station can be checked with 'Redundant CPU system status of each station' (SW01F0 to SW01F7). Depending on the link refresh timing, the update of 'Redundant CPU system status of each station' (SW01F0 to SW01F7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○

Appendix 4   List of Link Special Register (SW) Areas

The link special register (SW) stores the information during data link as a numerical value. Error locations and causes can be checked by using or monitoring the link special register (SW) in programs.

Application of the link special register (SW)

By using the link special register (SW), the status of CC-Link IE Controller Network can be checked from HMI (Human Machine Interfaces) as well as the engineering tool.

Refresh of the link special register (SW)

To use the link special register (SW), set them in "Refresh Setting" under "Basic Settings" so that they are refreshed to the devices or labels of the CPU module.

Mounting multiple network modules

The link special register (SW) of each network module is refreshed by the link special register (SW) of the CPU module shown below when the refresh parameters of each network module remain default.

Item	Module 1	Module 2	Module 3	Module 4
Device No.	SW0000 to SW01FF	SW0200 to SW03FF	SW0400 to SW05FF	SW0600 to SW07FF

Range where data are stored by users and range where data are stored by the system

The following ranges correspond to when the link special register (SW) areas are assigned from SW0000 to SW01FF.
- Stored by users: SW0000 to SW001F
- Stored by the system: SW0020 to SW01FF

List of link special register (SW) areas

The following table lists the link special register (SW) areas when they are assigned from SW0000 to SW01FF.

Point

Do not write any data to an area whose number is not on the following list. Doing so may cause malfunction of the programmable controller system.

A

No.	Name	Description	Availability	
			Control station	**Normal station**
SW0000	Link startup/stop direction	Set the content of link startup/stop directions. 00H: Own station 01H: All stations 02H: Specified stations 03H: Specified group 80H: Own station enforced (enabled only for link startup) 81H: All stations enforced (enabled only for link startup) 82H: Specified stations enforced (enabled only for link startup) 83H: Specified group enforced (enabled only for link startup) • Link startup is performed by 'System link startup' (SB0002) or 'System link stop' (SB0003).	○	○
SW0001 to SW0008	Link startup/stop station specification	Set the station number to start or stop data link when 02H or 82H is set in 'Link startup/stop direction' (SW0000). 0: Startup or stop not requested 1: Startup or stop requested	○	○

b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0001	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0002	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0003	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0004	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0005	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0006	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0007	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0008	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.

No.	Name	Description	Control station	Normal station
SW0009	RIRD/RIWT instruction arrival monitoring time	Specify the monitoring time until the instruction completion. If the instruction is not completed within the time, it will be resent the number of times specified in 'RIRD/RIWT instruction resend count' (SW000B). 0: 10 seconds (default) 1 to 360: 1 to 360 seconds If a value other than the above is specified, 360 seconds will be applied.	○	○
SW000B	RIRD/RIWT instruction resend count	Specify the number of times the instruction is to be resent when it is not completed within the monitoring time specified in 'RIRD/RIWT instruction arrival monitoring time' (SW0009). 0: Not resent (default) 1 to 7: 1 to 7 times If a value other than the above is specified, 7 times will be applied.	○	○
SW0012 to SW0013	Link startup/stop group specification	Set the transient transmission group number to start or stop data link when 03H or 83H is set in 'Link startup/stop direction' (SW0000). 0: Startup or stop not requested 1: Startup or stop requested	○	○

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0012	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0013	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

Each number in the table represents a transient transmission group number.

No.	Name	Description	Control station	Normal station
SW0020	Communication status with the CPU module	Stores the status of communications between a CC-Link IE Controller Network-equipped module and a CPU module. 0: Normal 1 or greater: Error (error code is stored)	○	○
SW0030	Link dedicated instructions processing result CH1	Stores the processing results of the link dedicated instruction that used channel 1 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0031	Link dedicated instructions processing result CH2	Stores the processing results of the link dedicated instruction that used channel 2 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0032	Link dedicated instructions processing result CH3	Stores the processing results of the link dedicated instruction that used channel 3 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
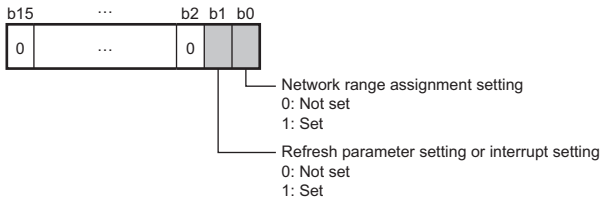
No.	Name	Description	Availability	
			Control station	Normal station
SW0033	Link dedicated instructions processing result CH4	Stores the processing results of the link dedicated instruction that used channel 4 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0034	Link dedicated instructions processing result CH5	Stores the processing results of the link dedicated instruction that used channel 5 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0035	Link dedicated instructions processing result CH6	Stores the processing results of the link dedicated instruction that used channel 6 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0036	Link dedicated instructions processing result CH7	Stores the processing results of the link dedicated instruction that used channel 7 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0037	Link dedicated instructions processing result CH8	Stores the processing results of the link dedicated instruction that used channel 8 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0038	■Only when optical fiber cables are used Link dedicated instructions processing result CH9	Stores the processing results of the link dedicated instruction that used channel 9 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0039	■Only when optical fiber cables are used Link dedicated instructions processing result CH10	Stores the processing results of the link dedicated instruction that used channel 10 of the own station. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW003A	ZNRD processing result	Stores the processing result of the ZNRD instruction. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW003B	ZNWR processing result	Stores the processing result of the ZNWR instruction. 0: Completed normally 1 or greater: Completed with an error (Error code is stored.)	○	○
SW0040	Network number	Stores the network number of the own station. Range: 1 to 239	○	○
SW0041	Transient transmission group number	Stores the transient transmission group number of the own station. 0: No group specification 1 to 32: Transient transmission group number	○	○
SW0042	Station number	Stores the station number of the own station. 1 to 120: Station number of own station ('Station number setting status of own station' (SB0070) is off) 255: Station number not determined ('Station number setting status of own station' (SB0070) is on)	○	○
SW0043	Mode status of own station	Stores the module operation mode of the own station. 0: Online mode 2: Offline mode B: Module communication test mode	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SW0044	Station setting	Stores the settings status of the own station. b15 b14 ... b7 b6 b5 b4 b3 b2 b1 b0 SW0044 | 0 | ... | 0 | | 0 0 0 | | 0 1 | Network type 01: CC-Link IE Controller Network Station type 0: Normal station 1: Control station Station type (mode) 0: Control station, Normal station 1: Extended mode (control station, normal station) CPU type 0: Other than basic model QCPUs and safety CPUs 1: Basic model QCPU or safety CPU	○	○
SW0046	Module type	■When optical fiber cables are used Stores the hardware status of the own station. b15 b14 b13 ... b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 SW0046 | 0 1 0 | ... | 0 0 0 1 0 0 0 0 0 0 | Transmission path information 1 00: Optical Transmission path information 2 0: Duplex system Topology 0: Loop type Cable type 0: Supports SX Model type 001: Module b14: Fixed to 1 (used in the system)	○	○
		■When Ethernet cables are used Stores the hardware status of the own station. b15 b14 b13 ... b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 SW0046 | * 1 0 | ... | 0 0 0 1 0 0 1 1 1 0 | Transmission path information 1 10: Twisted pair Transmission path information 2 1: Simplex system Topology 1: Bus/line/star type Cable type Fixed to 0 Model type 001: Module b14: Fixed to 1 (used in the system) b15: Variable (used in the system)	○	○
SW0047	Baton pass status of own station	Stores the baton pass status (transient transmission availability) of the own station. 0: Data link in progress 1: Data link stop 2: Baton pass in progress 3: Baton pass being terminated 4: Test in progress 5: Offline	○	○

No.	Name	Description	Availability	
			Control station	**Normal station**
SW0048	Cause of baton pass interruption	■When optical fiber cables are used Stores the cause of interruption in the communication (baton pass) of the own station. 00H: Normal communication 30H: At cable disconnection or power-on 31H: Cable insertion error 32H: Cable IN-OUT checking 33H: Disconnection or return in progress 40H: Offline mode 50H: Self-diagnostics in execution	○	○
		■When Ethernet cables are used Stores the cause of interruption in the communication (baton pass) of the own station. 00H: Normal communication 30H: At cable disconnection or power-on 33H: Disconnection or return in progress 40H: Offline mode	○	○
SW0049	Cause of data link stop	■When optical fiber cables are used Stores the cause which stopped the data link of the own station. 00H: Normal communication 01H: Stop direction 02H: Monitoring time timeout 10H: Parameter unreceived 11H: Station number of the own station out of the range 12H: Own station reserved 13H: Own station number duplication 14H: Control station duplication 15H: Control station duplication and own station number duplication 16H: Station number not set 17H: Network number irregularity 18H: Parameter error 19H: Parameter communication in progress 20H: CPU module stop error	○	○
		■When Ethernet cables are used Stores the cause which stopped the data link of the own station. 00H: Normal communication 01H: Stop direction 02H: Monitoring time timeout 10H: Parameter unreceived 11H: Station number of the own station out of the range 12H: Own station reserved 13H: Own station number duplication 14H: Control station duplication 15H: Control station duplication and own station number duplication 16H: Station number not set 17H: Network number irregularity 18H: Parameter error 19H: Parameter communication in progress 20H: CPU module stop error 60H: The network is incorrectly configured in ring topology (only for control station).	○	○
SW004A	Data link stop request station	Stores the station number of the station that performed the data link stop request for the own station. Range: 1 to 120 The data link stop request is performed by 'System link stop' (SB0003). (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW004B	CPU status of own station	Stores the status of the CPU module of the own station. 00H: No module mounted 01H: STOP (normal) 02H: STOP (moderate/major error) 03H: STOP (minor error) 04H: RUN (normal) 05H: RUN (minor error) 07H: PAUSE 0EH: Reset in progress 0FH: Initial processing	○	○

A

No.	Name	Description	Availability	
			Control station	**Normal station**
SW004C	Shared group number	Stores the shared group number of the own station. 0: No shared group setting 1 to 120: Shared group number	○	○
SW004D	Link startup result of own station	Stores the results when link is started by 'Link startup of own station' (SB0000). 0: Normal 1 or greater: Error (error code is stored) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW004F	Link stop result of own station	Stores the results when link is stopped by 'Link stop of own station' (SB0001). 0: Normal 1 or greater: Error (error code is stored) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0051	System link startup result	Stores the results when link is started by 'System link startup' (SB0002). 0: Normal 1 or greater: Error definition in own station (Error code is stored.) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0053	System link stop result	Stores the results when link is stopped by 'System link stop' (SB0003). 0: Normal 1 or greater: Error definition in own station (Error code is stored.) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0054	Parameter information	Stores parameter information. b15 ··· b2 b1 b0 0 ··· 0 Network range assignment setting 0: Not set 1: Set Refresh parameter setting or interrupt setting 0: Not set 1: Set (Conditions) • This register is enabled when 'Received parameter error' (SB0055) is off.	○	○
SW0055	Parameter setting status	Stores the parameter status. 0: Normal 1 or greater: Error (error code is stored) (Conditions) • This register is enabled when 'Received parameter error' (SB0055) is on.	○	○
SW0056	Current control station number	Stores the station number of the station which is actually operating as a control station. (Including sub-control station) Range: 1 to 120	○	○
SW0057	Specified control station number	Stores the control station number that has been set using a parameter. 0: Control station or sub-control station does not exist in a network. 1 to 120: Station number of the control station	○	○
SW0059	Total number of link stations	Stores the total number of stations which is set by a parameter. Range: 2 to 120	○	○
SW005A	Maximum baton pass station number	Stores the maximum station number of the stations where the baton pass is normally performed. Range: 2 to 120 (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW005B	Maximum data link station number	Stores the maximum station number of the station where the data link is normally performed. Range: 1 to 120 (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
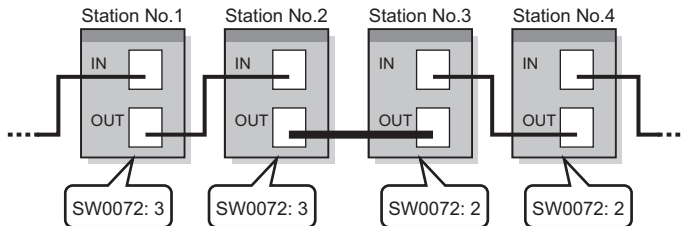
No.	Name	Description	Availability Control station	Normal station
SW005C	Block 1 I/O master station	Stores the I/O master station number of block 1 (LX/LY setting (1)). 0: No I/O master station 1 to 120: Station number (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SW005D	Block 2 I/O master station	Stores the I/O master station number of block 2 (LX/LY setting (2)). 0: No I/O master station 1 to 120: Station number (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SW0060	Maximum link scan time	Stores the maximum value of the link scan time during cyclic transmission. (Unit: ms) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0061	Minimum link scan time	Stores the minimum value of the link scan time during cyclic transmission. (Unit: ms) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0062	Current link scan time	Stores the present value of the link scan time during cyclic transmission. (Unit: ms) The stored value contains a maximum error of 1 ms. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0063	Constant link scan time setting value	Stores the setting value of the constant link scan which is set by a parameter. 0: No setting 1 to 500: Setting value of constant link scan (Unit: ms) (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	○
SW0064	■When optical fiber cables are used Loop status of own station	Stores the transmission path status of the own station. 00H: Normal 12H: IN side loopback (OUT side cable disconnection) 13H: IN side loopback (OUT-side cable insertion error) 14H: IN side loopback (OUT-side line establishing) 21H: OUT side loopback (IN-side cable disconnection) 31H: OUT side loopback (IN-side cable insertion error) 41H: OUT side loopback (IN-side line establishing) 22H: Disconnecting (IN-side or OUT-side cable disconnection) 23H: Disconnecting (IN-side cable disconnection, OUT-side cable insertion error) 24H: Disconnecting (IN-side cable disconnection, OUT-side line establishing) 32H: Disconnecting (IN-side cable insertion error, OUT-side cable disconnection) 33H: Disconnecting (IN-side or OUT-side cable insertion error) 34H: Disconnecting (IN-side cable insertion error, OUT-side line establishing) 42H: Disconnecting (IN-side line establishing, OUT-side cable disconnection) 43H: Disconnecting (IN-side line establishing, OUT-side cable insertion error) 44H: Disconnecting (IN-side or OUT-side line establishing)	○	○
	■When Ethernet cables are used Connection status of own station	Stores the connection status of the own station. 00H: Normal (communication in progress on P1 and P2) 02H: Normal (communication in progress on P1, cable disconnected on P2) 20H: Normal (cable disconnected on P1, communication in progress on P2) 12H: Loopback on P1 (cable disconnected on P2) 21H: Loopback on P2 (cable disconnected on P1) 22H: Disconnecting (cable disconnected on P1 and P2) 24H: Disconnecting (cable disconnected on P1, establishing line on P2) 42H: Disconnecting (establishing line on P1, cable disconnected on P2) 44H: Disconnecting (establishing line on P1 and P2)	○	○
SW0065	Loopback information	Stores the network loop status. 0: Normal 1: Loopback (enabled only when "Network Topology" under "Basic Settings" of the control station is set to "Ring" for Ethernet cables) 2: Errors on all stations	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SW0068	■When optical fiber cables are used IN-side line error occurrence rate maximum value	Stores the occurrence rate (maximum value) of received error frames at the IN side of the own station. (Unit: %) When 'Clear IN-side transmission error count' (SB0007) is turned on, the stored value for the occurrence rate is cleared.	○	○
	■When Ethernet cables are used PORT1 line error occurrence rate maximum value	Stores the occurrence rate (maximum value) of received error frames at the P1 side of the own station. (Unit: %) When 'Clear PORT1 transmission error count' (SB0007) is turned on, the stored value for the occurrence rate is cleared.	○	○
SW0069	■When optical fiber cables are used IN-side line error occurrence rate present value	Stores the occurrence rate (present value) of received error frames at the IN side of the own station. (Unit: %) When 'Clear IN-side transmission error count' (SB0007) is turned on, the stored value for the occurrence rate is cleared.	○	○
	■When Ethernet cables are used PORT1 line error occurrence rate present value	Stores the occurrence rate (present value) of received error frames at the P1 side of the own station. (Unit: %) When 'Clear PORT1 transmission error count' (SB0007) is turned on, the stored value for the occurrence rate is cleared.	○	○
SW006A	■When optical fiber cables are used OUT-side line error occurrence rate maximum value	Stores the occurrence rate (maximum value) of received error frames at the OUT side of the own station. (Unit: %) When 'Clear OUT-side transmission error count' (SB0008) is turned on, the stored value for the occurrence rate is cleared.	○	○
	■When Ethernet cables are used PORT2 line error occurrence rate maximum value	Stores the occurrence rate (maximum value) of received error frames at the P2 side of the own station. (Unit: %) When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored value for the occurrence rate is cleared.	○	○
SW006B	■When optical fiber cables are used OUT-side line error occurrence rate present value	Stores the occurrence rate (present value) of received error frames at the OUT side of the own station. (Unit: %) When 'Clear OUT-side transmission error count' (SB0008) is turned on, the stored value for the occurrence rate is cleared.	○	○
	■When Ethernet cables are used PORT2 line error occurrence rate present value	Stores the occurrence rate (present value) of received error frames at the P2 side of the own station. (Unit: %) When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored value for the occurrence rate is cleared.	○	○
SW006E	■Only when optical fiber cables are used Number of loop switches	Stores the number of switches (cumulative) of the communication path. When 'Clear loop switching count' (SB0009) is turned on, the stored value for the number of errors is cleared. When FFFFH (maximum value 65535) is counted, counting stops.	○	○
SW006F	Transient transmission error count	Stores the cumulative count of transient transmission errors. When 'Clear transient transmission error count' (SB000A) is turned on, the stored value for the number of errors is cleared. Range: 0 to 16 If count reaches the maximum value 16, the count stops.	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SW0070	■When optical fiber cables are used IN-side loopback station number	Stores the number of the station where loopback is being performed on the IN side. 0: No loopback stations 1 to 120: Station number 255: Station number not set (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
	■When Ethernet cables are used Loopback station number 1	Stores the number of the station where loopback is being performed. The other station numbers where loopback is being performed can be checked with 'Loopback station number 2' (SW0080). 0: No loopback stations 1 to 120: Station number 255: Station number not set (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off and 'Network configuration mismatch occurrence status' (SB0098) is off. • When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0071	■Only when optical fiber cables are used IN-side loopback factor	Stores the cause of loopback on the IN side. 00H: No loopback stations 02H: OUT side cable disconnection 03H: OUT-side cable insertion error 04H: OUT side line settling (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0072	■Only when optical fiber cables are used OUT-side mis-cabling station number	Stores the station number of the station where the OUT side cable is incorrectly inserted. The station number stored is the number for the other station the cable is connected to. 0: No station connects cable incorrectly 1 to 120: Station number (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled when 'IN-side loopback factor' (SW0071) is 03H (OUT side cable inserted incorrectly).	○	○
SW0074	■When optical fiber cables are used IN-side cable disconnection detection count	Stores the cumulative count that was detected for cable disconnections at the IN side. When 'Clear IN-side transmission error count' (SB0007) is turned on, the stored detection count is cleared. When FFFFH (maximum value 65535) is counted, counting stops.	○	○
	■When Ethernet cables are used PORT1 cable disconnection detection count	Stores the cumulative count that was detected for cable disconnections at the P1 side. When 'Clear PORT1 transmission error count' (SB0007) is turned on, the stored detection count is cleared. When FFFFH (maximum value 65535) is counted, counting stops.	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SW0080	■When optical fiber cables are used OUT-side loopback station number	Stores the number of the station where loopback is being performed on the OUT side. 0: No loopback stations 1 to 120: Station number 255: Station number not set (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
	■When Ethernet cables are used Loopback station number 2	Stores the number of the station where loopback is being performed. The other station numbers where loopback is being performed can be checked with 'Loopback station number 1' (SW0070). 0: No loopback stations 1 to 120: Station number 255: Station number not set (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off and 'Network configuration mismatch occurrence status' (SB0098) is off. • When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0081	■Only when optical fiber cables are used OUT-side loopback factor	Stores the cause of loopback on the OUT side. 00H: No loopback stations 20H: IN-side cable disconnection 30H: IN-side cable insertion error 40H: IN-side line establishing (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.	○	○
SW0082	■Only when optical fiber cables are used IN-side mis-cabling station number	Stores the station number of the station where the IN side cable is incorrectly inserted. The station number stored is the number for the other station the cable is connected to. 0: No station connects cable incorrectly 1 to 120: Station number (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled when 'OUT-side loopback factor' (SW0081) is 30H (IN side cable inserted incorrectly).	○	○
SW0084	■When optical fiber cables are used OUT-side cable disconnection detection count	Stores the cumulative count that was detected for cable disconnections at the OUT side. When 'Clear OUT-side transmission error count' (SB0008) is turned on, the stored detection count is cleared. When FFFFH (maximum value 65535) is counted, counting stops.	○	○
	■When Ethernet cables are used PORT2 cable disconnection detection count	Stores the cumulative count that was detected for cable disconnections at the P2 side. When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored detection count is cleared. When FFFFH (maximum value 65535) is counted, counting stops.	○	○

No.	Name	Description	Availability	
			Control station	**Normal station**
SW00A0 to SW00A7	Baton pass status of each station	Stores the baton pass status of each station. 0: Baton pass normal station 1: Baton pass faulty station |	b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 | SW00A0: 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 SW00A1: 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 SW00A2: 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 SW00A3: 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 SW00A4: 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 SW00A5: 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 SW00A6: 112 111 110 109 108 107 106 105 104 103 102 101 100 99 98 97 SW00A7: — — — — — — — — 120 119 118 117 116 115 114 113 Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.	○	○
SW00B0 to SW00B7	Data link status of each station	Stores the data link status for each station. 0: Data link normal station 1: Data link faulty station | b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 | SW00B0: 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 SW00B1: 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 SW00B2: 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 SW00B3: 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 SW00B4: 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 SW00B5: 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 SW00B6: 112 111 110 109 108 107 106 105 104 103 102 101 100 99 98 97 SW00B7: — — — — — — — — 120 119 118 117 116 115 114 113 Each number in the table represents a station number. — is fixed to 0. When group cyclic transmission is used, a station whose shared group is different from the group of the own station is detected as a cyclic transmission error station. (Including reserved stations) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Stations higher than the maximum station number are ignored.	○	○
SW00C0 to SW00C7	Reserved station setting status	Stores the reserved station setting status for each station. 0: A station other than a reserved station 1: Reserved station | b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 | SW00C0: 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 SW00C1: 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 SW00C2: 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 SW00C3: 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 SW00C4: 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 SW00C5: 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 SW00C6: 112 111 110 109 108 107 106 105 104 103 102 101 100 99 98 97 SW00C7: — — — — — — — — 120 119 118 117 116 115 114 113 Each number in the table represents a station number. — is fixed to 0. (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off. • Stations higher than the maximum station number are ignored.	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SW00D0 to SW00D7	Parameter communication status of each station	Stores the parameter communication status of each station. 0: Parameter communication completed or not executed 1: Parameter communication in progress _(bit table below)_ Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7). • Reserved stations and stations higher than the maximum station number are ignored.	○	×
SW00E0 to SW00E7	Parameter error status of each station	Stores the parameter error status of each station. 0: No error 1: Errors _(bit table below)_ Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.	○	×
SW00F0 to SW00F7	CPU operating status of each station	Stores the status of the CPU module for each station. (Including own station) 0: RUN, STEP-RUN 1: STOP, PAUSE, or a moderate or serious error occurring _(bit table below)_ Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7). • Reserved stations and stations higher than the maximum station number are ignored.	○	○

SW00D0 to SW00D7 bit table:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW00D0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW00D1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW00D2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW00D3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW00D4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW00D5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW00D6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW00D7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

SW00E0 to SW00E7 bit table:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW00E0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW00E1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW00E2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW00E3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW00E4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW00E5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW00E6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW00E7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

SW00F0 to SW00F7 bit table:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW00F0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW00F1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW00F2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW00F3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW00F4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW00F5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW00F6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW00F7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

No.	Name	Description	Availability Control station	Availability Normal station
SW0100 to SW0107	CPU moderate/ major error status of each station	Stores the moderate/major error occurrence status of the CPU module on each station. (Including own station) 0: No moderate/major error 1: Moderate or serious error occurring |	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
SW0100	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0101	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0102	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0103	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0104	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0105	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0106	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0107	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113 | Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7). • Reserved stations and stations higher than the maximum station number are ignored.	○	○
SW0110 to SW0117	CPU minor error status of each station	Stores the minor error occurrence status of the CPU module on each station. (Including own station) 0: Normal operation, or a moderate or serious error occurring 1: Minor error occurring |	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
SW0190	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0191	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0192	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0193	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0194	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0195	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0196	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0197	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113 | Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7). • Reserved stations and stations higher than the maximum station number are ignored.	○	○

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No.	Name	Description	Availability	
			Control station	Normal station
SW0120 to SW0127	■When optical fiber cables are used IN-side current error frame reception status of each station	Stores whether the error frame is currently received at the IN side of each station. 0: Not receiving 1: Currently receiving	○	○

Table for SW0120–SW0127:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0120	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0121	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0122	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0123	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0124	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0125	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0126	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0127	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.
• This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).

No.	Name	Description	Availability	
	■When Ethernet cables are used PORT1 current error frame reception status of each station	Stores whether the error frame is currently received at the P1 side of each station. 0: Not receiving 1: Currently receiving When 'Clear PORT1 transmission error count' (SB0007) is turned on, the stored value is cleared.	○	○

Table for SW0190–SW0197:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0190	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0191	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0192	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0193	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0194	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0195	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0196	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0197	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.
• This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).

No.	Name	Description	Availability	
			Control station	Normal station
SW0130 to SW0137	■When optical fiber cables are used OUT-side current error frame reception status of each station	Stores whether the error frame is currently received at the OUT side of each station. 0: Not receiving 1: Currently receiving	○	○

First section description table:

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              b15 b14 b13 b12 b11 b10 b9  b8  b7  b6  b5  b4  b3  b2  b1  b0
SW0130         16  15  14  13  12  11  10   9   8   7   6   5   4   3   2   1
SW0131         32  31  30  29  28  27  26  25  24  23  22  21  20  19  18  17
SW0132         48  47  46  45  44  43  42  41  40  39  38  37  36  35  34  33
SW0133         64  63  62  61  60  59  58  57  56  55  54  53  52  51  50  49
SW0134         80  79  78  77  76  75  74  73  72  71  70  69  68  67  66  65
SW0135         96  95  94  93  92  91  90  89  88  87  86  85  84  83  82  81
SW0136        112 111 110 109 108 107 106 105 104 103 102 101 100  99  98  97
SW0137          —   —   —   —   —   —   —   — 120 119 118 117 116 115 114 113
```

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.
• This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).

Second section:
■When Ethernet cables are used PORT2 current error frame reception status of each station
Stores whether the error frame is currently received at the P2 side of each station.
0: Not receiving
1: Currently receiving
When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored value is cleared.

No.	Name	Description	Availability Control station	Availability Normal station
SW0130 to SW0137	■When optical fiber cables are used OUT-side current error frame reception status of each station	Stores whether the error frame is currently received at the OUT side of each station. 0: Not receiving 1: Currently receiving *(see bit table below)*	○	○

```
              b15 b14 b13 b12 b11 b10 b9  b8  b7  b6  b5  b4  b3  b2  b1  b0
SW0130         16  15  14  13  12  11  10   9   8   7   6   5   4   3   2   1
SW0131         32  31  30  29  28  27  26  25  24  23  22  21  20  19  18  17
SW0132         48  47  46  45  44  43  42  41  40  39  38  37  36  35  34  33
SW0133         64  63  62  61  60  59  58  57  56  55  54  53  52  51  50  49
SW0134         80  79  78  77  76  75  74  73  72  71  70  69  68  67  66  65
SW0135         96  95  94  93  92  91  90  89  88  87  86  85  84  83  82  81
SW0136        112 111 110 109 108 107 106 105 104 103 102 101 100  99  98  97
SW0137          —   —   —   —   —   —   —   — 120 119 118 117 116 115 114 113
```

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.
• This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).

	Name	Description	Availability Control station	Availability Normal station
	■When Ethernet cables are used PORT2 current error frame reception status of each station	Stores whether the error frame is currently received at the P2 side of each station. 0: Not receiving 1: Currently receiving When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored value is cleared. *(see bit table below)*	○	○

```
              b15 b14 b13 b12 b11 b10 b9  b8  b7  b6  b5  b4  b3  b2  b1  b0
SW0130         16  15  14  13  12  11  10   9   8   7   6   5   4   3   2   1
SW0131         32  31  30  29  28  27  26  25  24  23  22  21  20  19  18  17
SW0132         48  47  46  45  44  43  42  41  40  39  38  37  36  35  34  33
SW0133         64  63  62  61  60  59  58  57  56  55  54  53  52  51  50  49
SW0134         80  79  78  77  76  75  74  73  72  71  70  69  68  67  66  65
SW0135         96  95  94  93  92  91  90  89  88  87  86  85  84  83  82  81
SW0136        112 111 110 109 108 107 106 105 104 103 102 101 100  99  98  97
SW0137          —   —   —   —   —   —   —   — 120 119 118 117 116 115 114 113
```

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.
• This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).

A

No.	Name	Description	Availability	
			Control station	Normal station
SW0140 to SW0147	■When optical fiber cables are used IN-side error frame detection status of each station	Stores the status that has received an error frame from power-on until the present at the IN side of each station. 0: Not received 1: Received When 'Clear IN-side transmission error count' (SB0007) is turned on, the stored value is cleared. b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 SW0140: 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 SW0141: 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 SW0142: 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 SW0143: 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 SW0144: 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 SW0145: 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 SW0146: 112 111 110 109 108 107 106 105 104 103 102 101 100 99 98 97 SW0147: — — — — — — — — 120 119 118 117 116 115 114 113 Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).	○	○
	■When Ethernet cables are used PORT1 error frame detection of each station	Stores whether the error frame was received at the P1 side of each station from power-on to the present. 0: Not received 1: Received When 'Clear PORT1 transmission error count' (SB0007) is turned on, the stored value is cleared. b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 SW0140: 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 SW0141: 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 SW0142: 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 SW0143: 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 SW0144: 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 SW0145: 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 SW0146: 112 111 110 109 108 107 106 105 104 103 102 101 100 99 98 97 SW0147: — — — — — — — — 120 119 118 117 116 115 114 113 Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SW0150 to SW0157	■When optical fiber cables are used OUT-side error frame detection status of each station	Stores the status that has received an error frame from power-on until the present at the OUT side of each station. 0: Not received 1: Received When 'Clear OUT-side transmission error count' (SB0008) is turned on, the stored value is cleared. See bit table below. Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).	○	○
	■When Ethernet cables are used PORT2 error frame detection of each station	Stores whether the error frame was received at the P2 side of the station No.0 from power-on to the present. 0: Not received 1: Received When 'Clear PORT2 transmission error count' (SB0008) is turned on, the stored value is cleared. See bit table below. Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).	○	○

Bit table (applies to both entries):

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0150	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0151	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0152	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0153	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0154	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0155	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0156	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0157	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

A

No.	Name	Description	Availability Control station	Normal station
SW0160 to SW0167	■Only when optical fiber cables are used Path switching detection status of each station	Stores the path switching detection status of each station from power-on to the present. 0: Not received 1: Detected The path switching detection status is cleared when 'Clear loop switching count' (SB0009) is turned on. Turn on 'Clear loop switching count' (SB0009) when clearing the path switching detection status of other stations.	○	○

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0160	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0161	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0162	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0163	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0164	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0165	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0166	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0167	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.

No.	Name	Description	Availability Control station	Normal station
SW0170 to SW0177	Transient error detection status of each station	Stores the transient transmission error detection status of each station from power-on to the present. 0: Not received 1: Detected The transient error detection status of the own station is cleared when 'Clear transient transmission error count' (SB000A) is turned on. Turn on 'Clear transient transmission error count' (SB000A) at other station side when clearing the transient error detection status of other stations.	○	○

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0170	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0171	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0172	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0173	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0174	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0175	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0176	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0177	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.

No.	Name	Description	Availability	
			Control station	Normal station
SW0180 to SW0187	External power supply status of each station	Stores the power supply status for external power supply by the CC-Link IE Controller Network module with external power supply function of each station. (Including own station) 0: Not supplied 1: Supplied This register is always off when the CC-Link IE Controller Network module does not have the external power supply function. Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.	○	○
SW0190 to SW0197	External power supply error status of each station	Stores the power supply error status for external power supply by the CC-Link IE Controller Network module with external power supply function of each station. (Including own station) 0: Normal 1: Error This register is always off when the CC-Link IE Controller Network module does not have the external power supply function. Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.	○	○
SW01A0 to SW01A7	Group cyclic transmission station information	Stores shared group setting information of each station. (Including own station) 0: Station in same shared group as own station or station with no shared group setting 1: Station in shared group different from own station Cyclic data from stations in different shared groups are not received. Each number in the table represents a station number. — is fixed to 0. (Conditions) • Stations higher than the maximum station number are ignored.	○	○

SW0180 to SW0187:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0180	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0181	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0182	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0183	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0184	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0185	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0186	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0187	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

SW0190 to SW0197:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0190	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0191	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0192	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0193	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW0194	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW0195	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW0196	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW0197	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

SW01A0 to SW01A7:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01A0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01A1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01A2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01A3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW01A4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW01A5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW01A6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW01A7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

A

No.	Name	Description	Availability Control station	Availability Normal station
SW01B0 to SW01B7	CPU type information of each station	Stores the CPU type information of each station. (Including own station) 0: Other than basic model QCPU and safe CPU 1: Basic model QCPU or safe CPU	○	○

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01B0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01B1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01B2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01B3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW01B4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW01B5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW01B6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW01B7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
- This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).
- Reserved stations and stations higher than the maximum station number are ignored.

No.	Name	Description	Availability Control station	Availability Normal station
SW01C0 to SW01C7	Redundant function information of each station	Stores redundant system support information of Redundant CPU or CC-Link IE Controller Network module of each station. (Including own station) 0: Redundant function not supported 1: Redundant function supported	○	○

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01C0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01C1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01C2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01C3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW01C4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW01C5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW01C6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW01C7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
- This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).
- Reserved stations and stations higher than the maximum station number are ignored.

No.	Name	Description	Availability Control station	Availability Normal station
SW01D0 to SW01D7	Separate mode status of each station	Stores the redundant system CPU operating mode of each station. (Including own station) 0: Backup mode (including stand-alone system) 1: Separate mode	○	○

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01D0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01D1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01D2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01D3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW01D4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW01D5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW01D6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW01D7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
- This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.
- This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7).
- Reserved stations and stations higher than the maximum station number are ignored.

No.	Name	Description	Availability	
			Control station	Normal station
SW01E0 to SW01E7	Pairing setting status of each station	Stores the pairing setting status for each station. (Including own station) 0: No pairing setting (including stand-alone system) 1: Pairing-set If pairing is set, the bit corresponding to the system B station is turned on. <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW01E0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW01E1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW01E2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW01E3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW01E4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW01E5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW01E6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW01E7</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table> Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7). • Stations higher than the maximum station number are ignored.	○	○
SW01F0 to SW01F7	Redundant CPU system status of each station	Stores the redundant CPU system status (control/standby system) of each station. (Including own station) 0: Control system (including stand-alone system) 1: Standby system <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW01F0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW01F1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW01F2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW01F3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW01F4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW01F5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW01F6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW01F7</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table> Each number in the table represents a station number. — is fixed to 0. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • This register is enabled only for normally operating stations in 'Baton pass status of each station' (SW00A0 to SW00A7). • Reserved stations and stations higher than the maximum station number are ignored.	○	○

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Appendix 5 List of Error Codes

This section lists the error codes, error details and causes, and action for the errors occur in the processings for data communication between CC-Link IE Controller Network-equipped module and external devices or caused by processing requests from the CPU module on the own station.

Error codes are classified into major error, moderate error, and minor error, and can be checked in "Error Information" in the "Module Diagnostics" window.

Error code	Error details and causes	Action	Detailed information
1080H	The number of writes to the flash ROM has exceeded 100000.	Replace the module.	—
1800H	A connection failure was detected in the network.	Correct the wiring status.	—
1811H	An error was detected in the CPU module.	Check the error of the CPU module and take action using the module diagnostics of the engineering tool.	—
1830H	Number of reception requests of transient transmission (link dedicated instruction) exceeded upper limit of simultaneously processable requests.	Lower the transient transmission usage frequency, and then perform again.	—
1845H	Too many processings of transient transmission (link dedicated instruction) and cannot perform transient transmission.	Correct the transient transmission execution count.	—
1860H	Baton pass stops with an error of communication line or CC-Link IE Controller Network-equipped module.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
20E0H	The module cannot communicate with the CPU module.	The hardware failure of the CPU module may have been occurred. Please consult your local Mitsubishi representative.	—
2220H	The parameter setting is corrupted.	Check the detailed information of the error by executing module diagnostics using the engineering tool, and write the displayed parameter. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	Parameter information • Parameter type
2221H	The set value is out of the range.	Check the detailed information of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number.	Parameter information • Parameter type • I/O No. • Parameter No. • Network No. • Station No.
24C0H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No. • CPU No.
24C1H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No. • CPU No.
24C2H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No. • CPU No.

Error code	Error details and causes	Action	Detailed information
24C3H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No. • CPU No.
24C6H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
3001H	• A station with the same station number was found in the same network. • Multiple control stations were detected in the same network.	Correct the station number or station type of the station where the error was detected. After taking the above actions, power off and on or reset all stations where the error was detected.	Parameter information • Parameter type • I/O No. • Parameter No. • Parameter item No.
3040H	Response data of the dedicated instruction cannot be created.	• Increase the request interval. • Decrease the number of request nodes. • Wait for a response to the previous request before sending the next request. • Correct the timeout value.	—
3C00H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
3C01H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
3C02H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
3C03H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
3C0FH	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
3C10H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
	A function which is not supported was used. (When Ethernet cables are used)	Check that firmware version of the RJ71EN71 supports the function to be used.	—
3C11H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the module, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
3C14H	A hardware failure has been detected.	Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the error module or CPU module. Please consult your local Mitsubishi representative.	—

Error code	Error details and causes	Action	Detailed information
3C2FH	An error was detected in the memory.	Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.	—
3E00H	An error was detected in the network module.	Reset the CPU module, and run it again. If the error occurs again even after taking the above, the possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.	—
3E01H	Network type of the own station is unexpected setting.	Rewrite the module parameter using the engineering tool. If the error occurs again even after taking the above, the possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.	—
4000H to 4FFFH	Errors detected by the CPU module (📖 MELSEC iQ-R CPU Module User's Manual (Application))		
E006H	The receive queue is full.	• Pause the transient transmission temporarily, and retry the operation. • Lower the transient transmission usage frequency, and then perform again. • Use the COM instruction to increase the frequency of transient transmission. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E102H	The own station is set as a reserved station.	Cancel the reserved station setting in "Network Range Assignment" of "Required Settings" of the control station. Or change the own station number to the one that is not specified as a reserved station.	—
E103H	The own station number set is out of the range of total stations.	Increase the number of total stations in "Network Range Assignment" of "Required Settings" of the control station. Or change the own station number to the one that is within the number of total stations.	—
E120H	The UINI instruction was executed at the control station.	The station number of the control station cannot be set by the UINI instruction. Set it in "Station No. Setting" of "Required Settings".	—
E121H	The UINI instruction was executed when "Station No. Setting" is set to "Set by Parameter".	Execute again after setting "Station No. Setting" in "Required Settings" of the normal station to "Set by Program".	—
E122H	The station number set for the own station by the UINI instruction is already used for the other station.	• Execute again after changing the own station number setting in the control data. • Execute again after changing the station number of other station which is duplicated.	—
E123H	After setting a station number with the UINI instruction, the instruction was executed again.	Station number setting with the UINI instruction is limited to one time only. Execute again after resetting the CPU module.	—
E160H	'Link startup/stop direction' (SW0000) is not set properly.	Check the setting and stop or restart cyclic transmission.	—
E162H	Re-execution was attempted during the processing of cyclic transmission stop/restart.	Retry the operation after the stop or restart of cyclic transmission is completed.	—
E163H	Re-execution was attempted during the processing of cyclic transmission stop/restart.	Retry the operation after the stop or restart of cyclic transmission is completed.	—
E164H	Re-execution was attempted during the processing of cyclic transmission stop/restart.	Retry the operation after the stop or restart of cyclic transmission is completed.	—
E165H	'Link startup/stop station specification' (SW0001 to SW0008) is not set properly.	Check the setting and stop or restart cyclic transmission.	—
E166H	'Link startup/stop group specification' (SW0012 to SW0013) is not set properly.	Check the setting and stop or restart cyclic transmission.	—
E170H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E171H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E172H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E173H	During execution of the communication test, the test was retried.	After completion of the communication test, retry the operation.	—

Error code	Error details and causes	Action	Detailed information
E174H	The maximum number of transmission completion signal retries was reached.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool, and retry the operation. • Check if "Routing Setting" in the CPU parameters is correctly set.	—
E175H	No response has been returned within the communication monitoring time.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool, and retry the operation. • Check if "Routing Setting" in the CPU parameters is correctly set.	—
E176H	Timeout has occurred without transmission completion.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool, and retry the operation. • Check if "Routing Setting" in the CPU parameters is correctly set.	—
E177H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E178H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E179H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E17AH	The response data have been received two times or more.	Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool, and retry the operation.	—
E17BH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E17CH	The target station specified for the communication test is incorrect.	• Correct "Target Station" of communication test, and retry the operation. • The own station, relay sending station, and the station which is mounted with the same CPU module cannot be specified as "Target Station".	—
E17DH	The IP address of the own station cannot be obtained when an IP communication test is performed.	Check the destination IP address of the IP communication test.	—
E17EH	The same numbers are not used for the first and second octets of the IP addresses set in the IP communication test destination setting in the network of the request source device, request destination device, and modules between them.	Check the destination IP address of the IP communication test.	—
E17FH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E180H	During execution of the cable test, the test was retried. (only when Ethernet cables are used)	After completion of the cable test, retry the operation.	—
E181H	The IP packet transfer function is not supported.	The transfer destination of the IP data does not support the IP packet transfer function.	—
E182H	During execution of the IP communication test, the test was retried.	Retry the operation after a while.	—
E183H	Transient transmission failed.	• Lower the transient transmission usage frequency, and then perform again. • Check if the switching hub is connected properly. (only when Ethernet cables are used) • Check if the cables are connected properly.	—
E184H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E185H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E201H	The same transient data have been received two times or more.	Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool. Although the error occurs, the second or later received transient data is discarded in the module.	—
E203H	The send buffer is full.	• Pause the transient transmission temporarily, and retry the operation. • Lower the transient transmission usage frequency, and then perform again. • Use the COM instruction to increase the frequency of transient transmission. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—

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Error code	Error details and causes	Action	Detailed information
E204H	The specified number of resends has been reached.	Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool.	—
E205H	The receive buffer is full.	• Pause the transient transmission temporarily, and retry the operation. • Lower the transient transmission usage frequency, and then perform again. • Use the COM instruction to increase the frequency of transient transmission. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E206H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E207H	Although the target station of transient transmission is connected in the same network, different network number is set.	Correct "Network No." in "Required Settings". When the parameter is not set, network number is set to 1 (default). Correct the network number of the other station.	—
E208H	The target station number specified for transient send/receive is out of range.	• Correct the target station number at the own station, and retry the operation. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E20BH	In transient transmission, the number of relay to other networks exceeded seven.	• Change the system configuration so that the number of relay stations may be seven or less. • Check if "Routing Setting" in the CPU parameters is correctly set.	—
E20AH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E20FH	The target station number is set to zero in transient transmission using protocols such as SLMP.	• Correct the target station number at the own station, and retry the operation. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E211H	When there was no control station, "Specified Control Station" was specified for transient transmission using protocols such as SLMP.	• Correct the target station number at the own station, and retry the operation. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E212H	When there was no control station, "Present Control Station" was specified for transient transmission using protocols such as SLMP.	• Correct the target station number at the own station, and retry the operation. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E213H	In transient transmission, timeout has occurred without transmission completion.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E215H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E216H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E218H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E21BH	Transient transmission was performed when the station number of the own station has not been set yet.	• Specify the station number using the UINI instruction, and retry the operation. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E21CH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E21EH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E21FH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E221H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E222H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E223H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—

Error code	Error details and causes	Action	Detailed information
E224H	Attribute code set in the CC-Link transient request frame is out of range.	• Execute the RIRD/RIWT instruction again after correcting the attribute code in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E225H	Access code set in the CC-Link transient request frame is out of range.	• Execute the RIRD/RIWT instruction again after correcting the access code in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E226H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E228H	The request command of transient transmission is incorrect.	Correct the request command at the request source, and retry the operation.	—
E229H	The control station does not exist.	Add the control station to the network.	—
E22AH	A transient transmission error was detected.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool, and take action. • Check if the switching hub and the cables are connected properly. • If the request source is on another network, check if the routing parameters are set correctly, and take action. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E22BH	Baton pass has not been performed.	Check the communication status.	—
E22CH	A transient transmission error was detected.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool, and take action. • Check if the switching hub and the cables are connected properly. • If the request source is on another network, check if the routing parameters are set correctly, and take action. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E22DH	A transient transmission error was detected.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool, and take action. • Check if the switching hub and the cables are connected properly. • If the request source is on another network, check if the routing parameters are set correctly, and take action. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E236H	The TTL of the IP data is incorrect.	Correct the TTL at the IP request source and retry the operation.	—
E237H	The IP address setting is not correctly set.	Correct the IP address of the control station.	—
E241H	The hardware of the target network module for dedicated instruction has failed.	Please consult your local Mitsubishi representative.	—
E242H	The hardware of the target network module for dedicated instruction has failed.	Please consult your local Mitsubishi representative.	—
E243H	The hardware of the target network module for dedicated instruction has failed.	Please consult your local Mitsubishi representative.	—
E244H	The hardware of the target network module for dedicated instruction has failed.	Please consult your local Mitsubishi representative.	—
E245H	The hardware of the target network module for dedicated instruction has failed.	Please consult your local Mitsubishi representative.	—
E24FH	When the dedicated instruction is executed, the target station number setting is not correct.	• Execute again after correcting the target station number in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E251H	Transient data for the same dedicated instruction have been received two times or more.	Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool.	—
E254H	The target station's CPU type specified for the dedicated instruction is out of range.	• Execute again after correcting the target station's CPU type in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—

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Error code	Error details and causes	Action	Detailed information
E255H	The data size specified for the dedicated instruction is out of range.	• Execute again after correcting the data length in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E256H	The arrival monitoring time specified for the dedicated instruction is out of range.	• Execute again after correcting the arrival monitoring time in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E257H	The number of resends specified for the dedicated instruction is out of range.	• Execute again after correcting the number of resends in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E258H	The network number specified for the dedicated instruction is out of range.	• Execute again after correcting the target station No. in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E259H	The channel used in the dedicated instruction is incorrect.	• Set 1 to 8 for the target channel number in the control data when executing the SEND instruction. • Execute again after correcting the number of the channel used by own station in the control data.	—
E25AH	The modification specification specified for the UINI instruction is out of range.	• Execute again after correcting the modification specification in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E25BH	The own station No. specified for the dedicated instruction is out of range.	• Execute again after correcting the own station number in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E262H	When the target station specified for the dedicated instruction is "Group" or "All stations", "With arrival confirmation" is specified for execution type. For the REQ instruction, the specified request type is incorrect.	• Execute again after changing the execution type in the control data to "No arrival confirmation". • For the REQ instruction, execute again after correcting request type. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E264H	Transmission did not completed after execution of the dedicated instruction, and timeout has occurred.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E265H	No response was received after execution of the dedicated instruction, and timeout has occurred.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool. • When the dynamic routing function is used, check the buffer memory area of Communication path determination status and check if communication to the target network number is possible. • For the RECV instruction, execute again after correcting the channels used by own station in the control data. • For the RECV instruction, check that 'RECV execution request flag CH1' (SB0030) to 'RECV execution request flag CH8' (SB0037) are on. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E266H	The SEND instruction was received from other network.	• Change the target station at the station that executed the SEND instruction. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E267H	The own station number was set as the target station number.	• Execute again after correcting the target station number in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E268H	In the execution/abnormal completion type specification, the bit in the area fixed to 0 is turned on.	• Execute again after correcting the execution/abnormal completion type in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E269H	The request type or sub-request type specified in the REQ instruction is incorrect.	• Execute again after correcting the request or sub-request type in the request data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—

Error code	Error details and causes	Action	Detailed information
E26AH	When there was no control station on the network, the dedicated instruction was executed specifying the specified control station or current control station.	• Execute again after correcting the target station number in the control data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E26CH	The channel specified is being used for another instruction.	• Retry the operation after a while. • Change the channels used by own station or the target station's channel in the control data.	—
E26DH	The channel specified is being used for event parameters.	• Execute again after correcting the channel used by own station in the control data. • Execute again after correcting the channel used in the interrupt settings. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E26EH	The device range specified for the ZNRD/ZNWR instruction is not correct.	• Execute again after correcting the setting data for the ZNRD/ZNWR instruction. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E26FH	The device range specified for the ZNRD/ZNWR instruction is not correct.	• Execute again after correcting the setting data for the ZNRD/ZNWR instruction. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E271H	The operation mode specified in the REQ instruction (remote RUN/STOP) is incorrect.	• Execute again after correcting the operation mode in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E272H	When the remote RUN is specified in the REQ instruction (remote RUN/STOP), the specified clear mode is not correct.	• Execute again after correcting the clear mode in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E273H	The control data specified for the RRUN instruction is not correct.	• Execute again after correcting the mode in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E274H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E277H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E278H	The request data size of transient transmission is out of range.	• Correct the request command at the request source, and retry the operation. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E279H	The routing setting is not correctly set.	• Correct the network number at the request source, and retry the operation. • If the request source is on another network, check if "Routing Setting" in the CPU parameters is correctly set.	—
E27AH	Dedicated instructions which cannot be executed simultaneously were executed.	• Other dedicated instructions are in execution. Execute again after a while. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E27BH	The target station type specification of the dedicated instruction is incorrect.	• Execute again after correcting the station type of the target station at the request source. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E27CH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E27DH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E286H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E2A0H	The receive buffer for the CC-Link dedicated instruction is full.	Too many transient requests have been received from CC-Link IE Controller Network devices. Adjust the timing of transient requests from CC-Link IE Controller Network devices so that each request will issued at certain intervals.	—
E2A1H	The send buffer for the CC-Link dedicated instruction is full.	Too many transient requests have been received from CC-Link IE Controller Network devices. Adjust the timing of transient requests from CC-Link IE Controller Network devices so that each request will issued at certain intervals.	—

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Error code	Error details and causes	Action	Detailed information
E2A2H	The hardware of the network module has failed.	• Check the network status using the CC-Link IE Controller Network diagnostics of the engineering tool. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E2A3H	The frame length (L) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2A4H	The gate count (GCNT) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2A5H	The destination station number (DA) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2A6H	The source station number (SA) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2A7H	The destination application type (DAT) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2A8H	The source application type (SAT) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2A9H	The destination network number (DNA) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2AAH	The destination station number (DS) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2ABH	The source network number (SNA) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2ACH	The source station number (SS) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2ADH	The data length (L1) in the transient transmission frame is incorrect.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2AEH	The destination station number (DA) in the transient transmission frame of the received data matches the own station, but the destination network number (DNA) or the destination station number (DS) does not match the own station.	An invalid transient frame was received from a CC-Link IE Controller Network device. Correct the contents of the transient frame on the external device side. For details, please consult the manufacturer of the CC-Link IE Controller Network device.	—
E2AFH	The own station number was set as the target station number of the CC-Link dedicated instruction.	Check that the target station in the send data is not the own station.	—
E2B0H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E501H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E502H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—

Error code	Error details and causes	Action	Detailed information
E503H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E504H	Transient transmission (dedicated instruction, engineering tool connection) was executed while the own station did not perform baton pass.	• Execute the dedicated instruction interlocking with 'Baton pass error status of own station' (SB0047) and 'Baton pass status of each station' (SW00A0 to SW00A7). • Check the 'Cause of baton pass interruption' (SW0048) at the own station and restart baton pass before executing the transient transmission. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E505H	Transient transmission (dedicated instruction, engineering tool connection) was executed with the own station number duplicated.	Remove the duplication of the own station numbers before executing the transient transmission.	—
E521H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
E5F0H	Transient transmission (dedicated instruction, engineering tool connection) was executed while the target station did not perform baton pass.	• Return the target station. • Execute the dedicated instruction interlocking with 'Baton pass error status of own station' (SB0047) and 'Baton pass status of each station' (SW00A0 to SW00A7). • Check the 'Cause of baton pass interruption' (SW0048) at the target station and restart baton pass before executing the transient transmission. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
E5F1H	The target station number of transient transmission is already in use.	Change the target station number.	—
E5F8H	There is a station that does not support the IP packet transfer function on the communication path when the IP packet transfer function is used.	Check the station on the communication path, and check whether the module in the station supports the IP packet transfer function.	—
E840H	Number of transient request exceeded the upper limit of simultaneously processable requests.	• Pause the transient transmission temporarily, and retry the operation. • Lower the transient transmission usage frequency, and then perform again.	—
E841H	The request data size of memory read/write command is out of range.	Correct the read or write size specification at the transient request source, and retry the operation.	—
E842H	• Routing information to the destination network number is not registered. • In transient transmission, the number of relay to other networks exceeded seven.	• Correct the target network number at the request source, and retry the operation. • Correct the communication path from the transient request source to the destination, and retry the operation. • When the dynamic routing is not used, or the module of the series other than MELSEC iQ-R is included, retry the operation after correcting the routing parameters. • Change the system configuration so that the number of relay stations may be seven or less.	—
E843H	The module operation mode is set to a mode in which transient transmission cannot be executed.	After completion of the module communication test, retry the operation.	—
E844H	Incorrect frame is received. • Unsupported pre-conversion protocol • Unsupported frame type • Application header variable part • Application header HDS • Application header RTP • Read command not requiring response	Correct the request data at the transient request source, and retry the operation.	—
EA00H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
EA01H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—

Appendix 6 Starting Interrupt Sequence Programs

If the interrupt conditions preset using the engineering tool are satisfied, an interrupt request is sent to the CPU module to start the interrupt program.

Interrupt conditions are based on the changes in the link devices (LB, LW, LX) and the network status (SB, SW) checked every link scan or the data reception status of the channel specified by using the RECVS instruction.
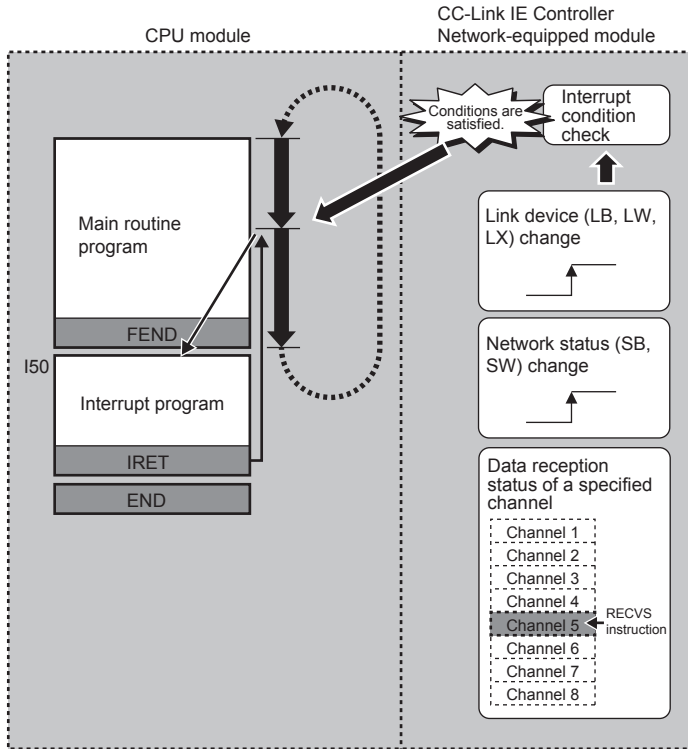
Appendix 6.1 Interrupt settings

Set conditions for sending an interrupt request to the CPU module.

Setting method

The following shows the procedure for interrupt settings.

1. Set the interrupt conditions.

✎ [Module Parameter] ⇨ [Application Settings] ⇨ [Interrupt Settings]

Up to 16 interrupt conditions can be set.

No.	Device/ Reception Channel	Device No./ Channel No.	Detection Method	Condition Type	Condition Value	Interrupt Pointer	Comment
SI 00							
SI 01							
SI 02							
SI 03							
SI 04							
SI 05							
SI 06							
SI 07							
SI 08							
SI 09							
SI 10							
SI 11							
SI 12							
SI 13							
SI 14							
SI 15							

2. Click the [Apply] button to close the "Interrupt Settings" window.

Setting items

Item	Description	Setting range
Word Device Setting Value Input Format	Right-click in the "Interrupt Settings" window and select a format from the "Word Device Setting Value Input Format" menu.	• Decimal • Hexadecimal (Default: Decimal)
Device/Reception Channel	Set an interrupt condition device. Set the channel number when "Reception Channel" is selected in "Device/Reception Channel".	Refer to the next table.
Device No./Channel No.		
Detection Method	Select the detection timing of an interrupt generated by the device set in "Device/Reception Channel" and "Device No./Channel No.".	
Condition Type		
Condition Value	When "LW" or "SW" is selected in "Device/Reception Channel", enter a word device value that triggers an interrupt.	
Interrupt Pointer	Set an interrupt pointer (I) used for an interrupt program.	
Comment	Set a comment for the interrupt pointer used.	

(Setting range)

Device/ Reception Channel	Device No. /Channel No.	Detection Method	Condition Type	Condition Value	Interrupt Pointer
LB	0H to 7FFFH	Level + ON: Interrupt occurs by turning on the device. Level + OFF: Interrupt occurs by turning off the device. Edge + ON: Interrupt occurs at the rising edge of the device. Edge + OFF: Interrupt occurs at the falling edge of the device.		—	Device: I0 to I15, I50 to I1023
LX	0H to 1FFFH				
SB	0H to 1FFH				
LW	0H to 1FFFFH	Level + Values Match: Interrupt occurs when values match. Level + Values Mismatch: Interrupt occurs when values do not match. Edge + Values Match: Interrupt occurs when values match (first time only). Edge + Values Mismatch: Interrupt occurs when values do not match (first time only).		0 to 65535 (0H to FFFFH)	
SW	0H to 1FFH				
Reception Channel	1 to 8	Edge (fixed)	Reception Completed (fixed)[1]	—	

*1 An interrupt occurs when the channel specified in "Device No./Channel No." receives data.

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Point

Using an interrupt program will eliminate the need for describing a start condition in a program. This leads to reduction in the number of steps and sequence scan time.

Precautions

■When "Detection Method" is set to "Level" and the interrupt condition is always satisfied

If the sequence scan takes much longer than the link scan, since interrupt processing is activated in each link scan, sequence scan time may greatly increase, resulting in a watchdog timer error of the CPU module.

When "Detection Method" is set to "Level" and the interrupt condition is always satisfied, do not use interrupt settings and correct the interrupt condition in the program.

■Before executing an interrupt program

Execute the EI instruction in a main routine program and enable an interrupt. (MELSEC iQ-R CPU Module User's Manual (Application))

■When multiple interrupts have simultaneously occurred

The operation may delay.

■When the mode of the CC-Link IE Controller Network-equipped module is "Module Communication Test" or "Offline"

The CC-Link IE Controller Network-equipped module can send an interrupt request to the CPU module when the mode is "Online". The module cannot send the request when the mode is "Module Communication Test" or "Offline".

■Starting an interrupt program at the rising/falling edge of the specified device

Do not use the rising/falling edge of a specified device (such as the PLS and PLF instructions) as a trigger of an interrupt program because a change in the device may fail to be read.

Ex.

Sending an interrupt request by turning on LB100 in a station in network number 7

| PLS | J7\B100 | Since change of LB100 may not be read, the rising edge cannot be specified as an interrupt condition.

■When an interrupt cannot be generated

Changes in the interrupt condition device cannot be detected if the change is shorter than the transmission delay time.

■Using cyclic data in an interrupt program

When an interrupt program is executed, the link device data is not link-refreshed to CPU module devices or module labels.

Directly access the link devices of the CC-Link IE Controller Network-equipped module by link direct access.

Appendix 6.2 Interrupt by using the RECVS instruction

Interrupt programs can be started when a channel specified in parameters by using the RECVS instruction receives the SEND instruction.

Selecting "Reception Channel" in "Device/Reception Channel" enables "Device No./Channel No." and "Interrupt Pointer".

In the following example, data is sent from the station number 3 to the channel 5 in the station number 15 by using the SEND instruction.

Interrupt setting parameters are set so that the interrupt program is started by the SEND instruction to the channel 5 in the station number 15.
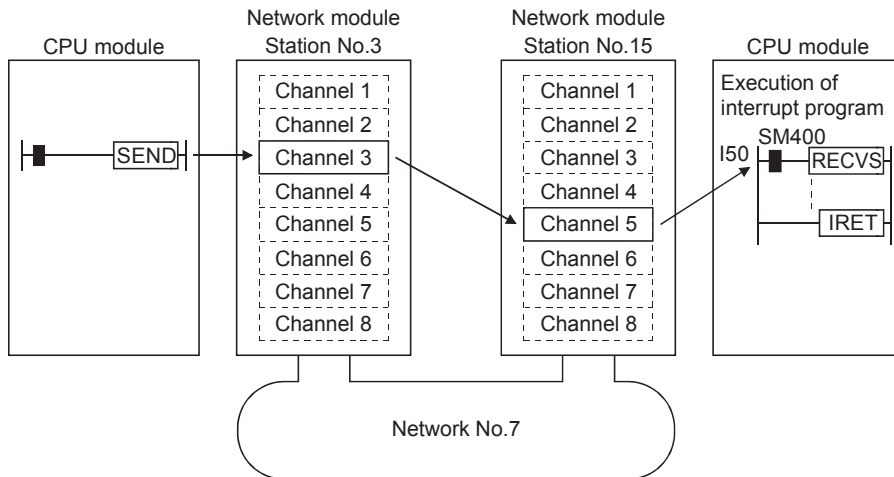
Appendix 6.3 Interrupt by using the link devices (LB/LW/LX) for cyclic transmissions

■Comparison with creating interrupt conditions using sequence programs

A specified interrupt sequence program can be executed from other stations using the rising/falling edge of the link devices (LB/LX) or match/mismatch of the link register (LW) as an interrupt condition.
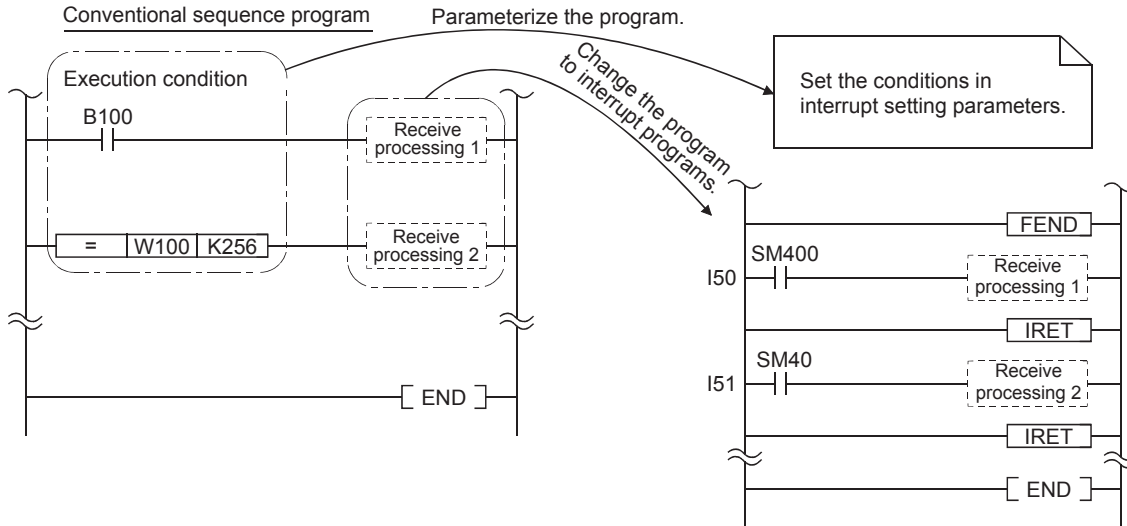
■Interrupt setting parameters

The interrupt by using the link devices (LB/LW/LX) can be used for normal cyclic transmissions and a direct access destination.

In the following example, the link device (LB100) of the station number 15 is turned on (1) by using the direct access to link devices of the station number 3 (specify a range out of the refresh range in the own station send range). Interrupt setting parameters are set to start the interrupt program when LB100 of the station number 15 turns on.

No.	Device/Reception Channel	Device No./Channel No.	Detection Method	Condition Type	Condition Value	Interrupt Pointer	Comment
SI 00	LB	00100	Edge	ON		I50	
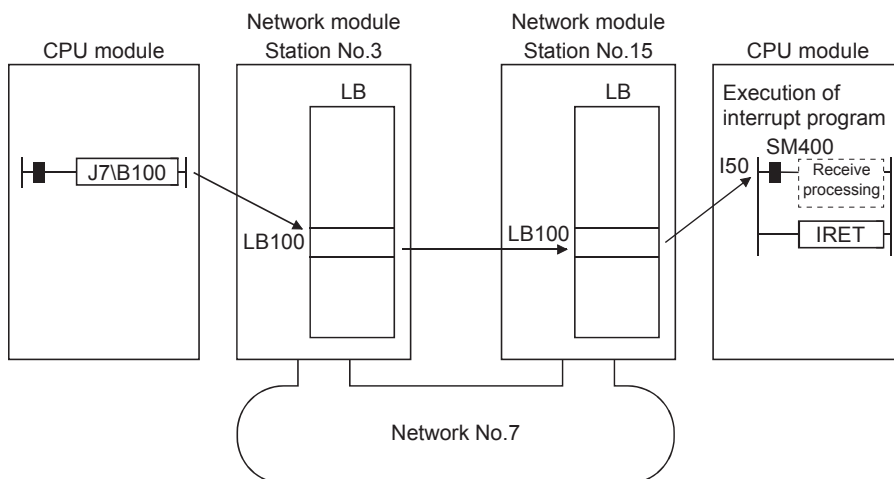
Point

- When the processing of a sequence program is executed at a high speed, the scan time may be extended since the processing time of the program is extended by the execution time of the interrupt program.
- The operation may delay if multiple interrupts have simultaneously occurred.
- This type of interrupt cannot be used during offline and online test.
- Do not use the rising/falling edge of a specified device (such as the PLS and PLF instructions) as a trigger of an interrupt sequence program because a change in the device may fail to be read.

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Appendix 6.4 Interrupt by using the link special devices (SB/SW)

■Interrupt setting parameters

A specified interrupt sequence program can be executed using the control information (SB/SW) of data link as an interrupt condition.

In the following example, set interrupt setting parameters to start the interrupt program when SB49 of the station number 15 turns on (when a data link error has occurred).

No.	Device/ Reception Channel	Device No./ Channel No.	Detection Method	Condition Type	Condition Value	Interrupt Pointer	Comment
SI 00	SB	00049	Edge	ON		I51	
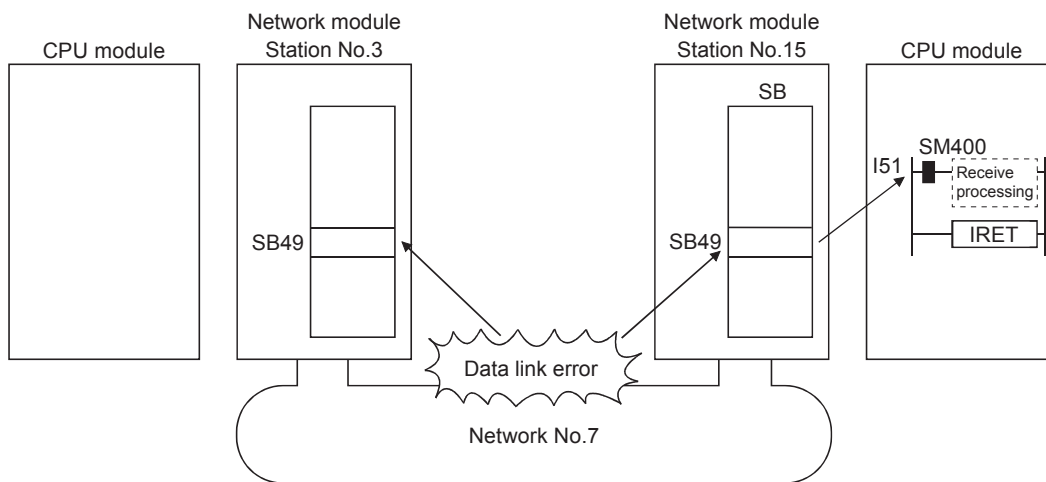

```
CPU module    Network module        Network module    CPU module
              Station No.3          Station No.15

                                          SB
                                                        SM400
                                                    I51 ┤├──  Receive
                                                              processing
              SB49                    SB49                    IRET

                        Data link error

                          Network No.7
```

> **Point**
> • When the processing of a sequence program is executed at a high speed, the scan time may be extended since the processing time of the program is extended by the execution time of the interrupt program.
> • The operation may delay if multiple interrupts have simultaneously occurred.
> • This type of interrupt cannot be used during offline and online test.

Appendix 6.5 Receiving data from the programmable controller of another station (for interrupt programs)

G.RECVS, Z.RECVS

`RnCPU` `RnENCPU` `RnPCPU` `RnSFCPU (Standard)` `RnSFCPU (Safety)` ✗

These instructions read the data received from the programmable controller of another station (for interrupt programs).

Ladder	ST
┤ [ ] (U) (s) (d1) (d2) ├	ENO:=G_RECVS(EN,U,s,d1,d2); ENO:=Z_RECVS(EN,U,s,d1,d2);

FBD/LD
┌─[ ]─┐ EN   ENO U   d1 s   d2

■Execution condition

Instruction	Execution condition
G.RECVS Z.RECVS	⌐_⌐

Setting data

■Description, range, data type

Operand		Description	Range	Data type	Data type (label)
(U)	G.RECVS	Start I/O number (first three digits in four-digit hexadecimal representation) of own station or own node	00H to FEH	16-bit unsigned binary	ANY16
	Z.RECVS	Start I/O number (first three digits in four-digit hexadecimal representation) of own station or own node	00H to FEH	String	ANY16_OR_STRING_SINGLE
(s)		Own station start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(d1)		Own station start device for storing the receive data (A continuous area for the receive data length is required.)	—	Device name	ANY16[*1]
(d2)		Dummy	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN		Execution condition	—	Bit	BOOL
ENO		Execution result	—	Bit	BOOL

[*1] When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

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■Applicable devices

| Operand | | Bit | Word | | | Double word | Indirect | Constant | | | Others |
		X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z	LT, LST, LC	LZ	specification	K, H	E	$	(U)
(U)	G.RECVS	—	—	○	—	—	—	—	○	○	—	—	○
	Z.RECVS	—	—	○	—	—	—	—	○	—	—	○	○
(s)		—	—	○*2	—	—	—	—	○	—	—	—	—
(d1)		—	—	○*2	—	—	—	—	○	—	—	—	—
(d2)		○*1	—	○*3	—	—	—	—	—	—	—	—	—

*1 FX and FY cannot be used.
*2 FD cannot be used.
*3 T, ST, C, and FD cannot be used.

■Control data

Operand: (s)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	System area	—	—	—
+1	Completion status	The instruction completion status is stored. • 0: Normal • Other than 0: Error (error code)	—	System
+2	Own station storage channel	Specify the channel to be used by the own station.	1 to 8, 11 to 18	User
+3	Channel used by sending station	The channel number (1 to 8) used by the sending station is stored.	1 to 8	System
+4	Sending station network number	The network number (1 to 239) of the sending station is stored.	1 to 239	System
+5	Sending station number	The station number of the sending station is stored. [Ethernet or CC-Link IE Controller Network] • 1 to 120: Station number (station number from which data is received) [CC-Link IE Field Network] • 125: Master station • 1 to 120: Local station, intelligent device station, submaster station	1 to 120, 125	System
+6 to +8	System area	—	—	—
+9	Receive data length	The number of data received and stored in (d1)+0 to (d1)+□ is stored. • 0: No receive data • 1 to 960: Number of words of receive data	0 to 960	System

■Receive data

Operand: (d1)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0 to +□	Receive data	Receive data is stored.	—	System

Point

The continuous area (a maximum of 960 words) for the receive data length ((s)+9) is required in the receive data storage device (d1).

Processing details

- These instructions read the receive data of the target station sent to (s)+2 (own station storage channel) of control data.
- The SEND instruction is executed to send data. The data received from the sending station is stored in the own station channel specified by the sending station, and the interrupt program with the interrupt number specified by the engineering tool starts. The RECVS instruction is used in this interrupt program to read receive data.
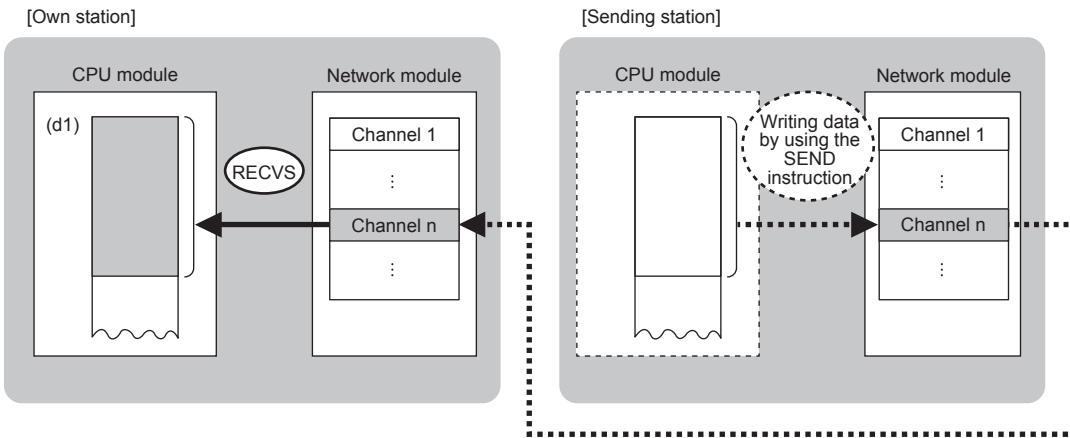
- The following figures show the execution timing of the RECVS instruction.
  - When completed successfully
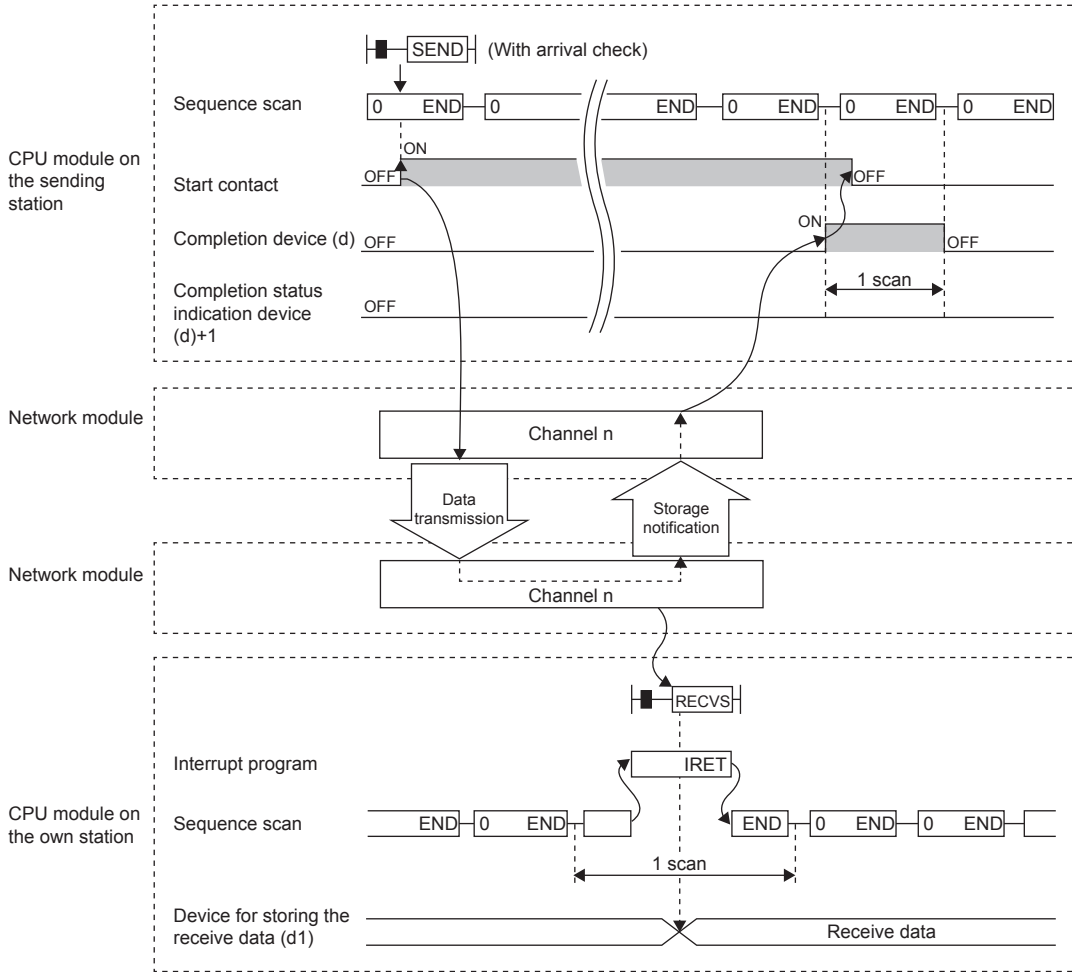
  - When completed with an error
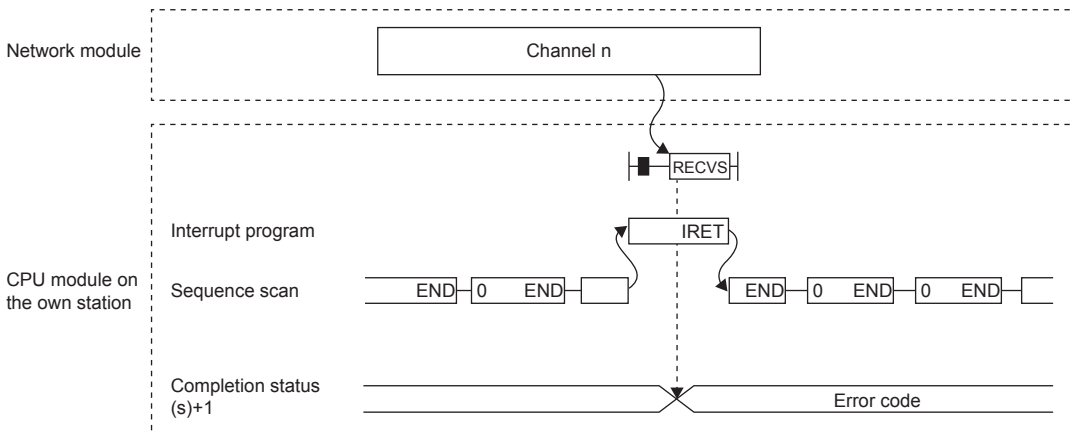
- The RECVS instruction is used in interrupt programs and processing is completed in a single scan.
- When the RECVS instruction is used to read receive data from the same channel, the RECV instruction (for use in the main program) cannot be used in combination.

Appendix 6.6 Usage example

This section provides parameter setting examples and program examples under the following interrupt conditions.
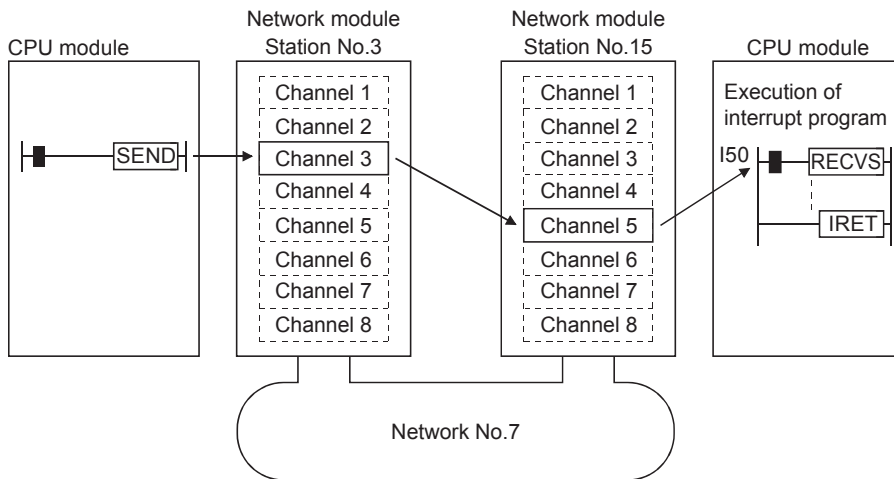
Parameter settings in the interrupt setting window

Set interrupt setting parameters as follows to issue an event to the CPU module when the channel 5 of the network module on the station number 15 receives data.

No.	Device/ Reception Channel	Device No./ Channel No.	Detection Method	Condition Type	Condition Value	Interrupt Pointer	Comment
SI 00	Reception Channel	5	Edge	Reception Completed		I50	

Program example

■Program for the station number 3

When actually using the following program, provide an interlock circuit referring to App. - 69 Interlock-related signals.

Line	Instruction			Description
1 (0)	SM400 Control data setting command	MOV	H81	D0	With arrival check/Set the clock data.
2		MOV	K3	D2	Own station channel
3		MOV	K5	D3	Target station storage channel
4		MOV	K7	D4	Target network No.
5		MOV	K15	D5	Target station No.
6		MOV	K5	D7	Number of resends
7		MOV	K20	D8	Arrival monitoring time (20 seconds)
8		MOV	K4	D9	Send data length (4 words)
9 (18)	SM400 Send data setting command	MOV	K10	D100	Send data
10		MOV	K20	D101	
11		MOV	K30	D102	
12		MOV	K40	D103	
13 (28)	M100 Send command	JP.SEND	J7 D0 D100 M0	
14 (38)	M0	Processing program at send completion	
15	M1	Processing program at normal completion	
16	M1	Processing program at abnormal completion	Read an error code.
17		MOV D1 D200	
18 (48)		END	

■Program for the station number 15

When actually using the following program, provide an interlock circuit referring to App. - 69 Interlock-related signals.

Interrupt program

- (0) SM400 — EI : Allow the interruption.
- Main program
- (2) — FEND : End the main program.
- (4) SM400 Always On — MOV K5 D22 : Store the channel No. for receive check of the own station.
- Z.RECVS "J7" D20 D1000 M0 : Store four words of data from channel 5 of the network module (network No.7) to D1000 to D1003.
- (19) — IRET
- (20) — END
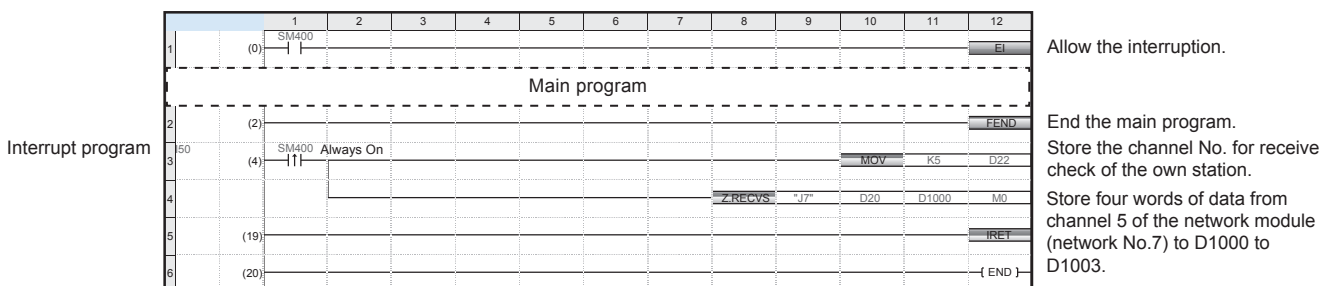
Point

- The link special relay (SB00A0 to SB00A7) for RECV instruction request corresponding to the channel number that receives data is not set.
- When the processing of a sequence program is executed at a high speed, the scan time may be extended since the processing time of the program is extended by the execution time of the interrupt program.
- The operation may delay if multiple interrupts have simultaneously occurred.
- This type of interrupt cannot be used during offline and online test.
- When the RECVS instruction is used, the EI instruction (interrupt enabled) must be executed in a main program since the interrupt program is started by setting parameters. If it is not executed at data reception, the state of channel in use is held.

Appendix 6.7 Additional exercise I (interrupt processing)

The system configuration of the demonstration machine for Exercise I is used.

Write parameters and sequence programs to each station and check the operation.

Setting parameters with GX Works3

Set the module parameters as follows.

For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Required Settings

• Control station (station No.1)

Item	Setting
Station Type	
Station Type	Control Station
Network Number	
Network Number	1
Station Number	
Station No.	1
Network Range Assignment	
Network Range Assignment Setting	<Detailed Setting>

• Normal station (station No.2)

Item	Setting
Station Type	
Station Type	Normal Station
Network Number	
Network Number	1
Station Number	
Setting Method	Parameter Editor
Station No.	2

■Network Range Assignment setting (control station only)

Total No. of Stations	2	Switch Windows	LB/LW Setting (1)	Batch Setting(G)

Station No.	Station Type	LB			LW			Reserved Station	Pairing	Shared Group
		Points	Start	End	Points	Start	End			
1	Control Station	256	0000	00FF	256	00000	000FF	No Setting	Disable	
2	Normal Station	256	0100	01FF	256	00100	001FF	No Setting	Disable	

■Refresh Setting (common to all stations)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF
-	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF
1	LB	8192	00000	01FFF	⬌	Specify Device	B	8192	00000	01FFF
2	LW	8192	00000	01FFF	⬌	Specify Device	W	8192	00000	01FFF

■Interrupt Settings (only for the normal station)

No.	Device/ Reception Channel	Device No./ Channel No.	Detection Method	Condition Type	Condition Value	Interrupt Pointer	Comment
SI 00	LB	00000	Edge	ON		I50	
SI 01	LW	00000	Edge	Values Match	500	I51	
SI 02	SB	00064	Edge	ON		I52	
SI 03	SW	000F0	Edge	Values Match	1	I53	
SI 04	Reception Channel	1	Edge	Reception Completed		I54	

Sequence program

The following shows the sequence program of each station.

■Program for the control station (station No.1)

Project name	1Mp1 (interrupt)

1 Check of own station

Rung (0): SB20 (Module status, normally closed) — SB47 (Baton pass status of own station, normally closed) — SB49 (Data link status of own station, normally closed) — MC N0 M0

N0 M0

4 Check of station No.2

Rung (27): SW0A0.1 (Baton pass status of each station, normally closed) — SW0B0.1 (Cyclic transmission status of each station, normally closed) — MC N1 M1

N1 M1

7 Send to station No.2

8 Interrupt processing 1) LB0 = ON Edge detection

Rung (54): X102 —————(B0)

10 Interrupt processing 2) LW0 = 500 Edge detection

Rung (127): X103 — MOVP D20 W0

Rung (181): X103 (normally closed) — MOVP K0 W0

13 Interrupt processing 3) SB64 = ON Edge detection (When the cable is detected)

14 Interrupt processing 4) SWF0 = 1 Edge detection (When the operating status of the CPU module of the station No.1 is changed to STOP)

15 Interrupt processing 5) Data reception

Rung (185): X105 (rising edge) — MOV D21 D110 (Start device for storing send data)

17 Execution/error completion type

Rung (442): X105 (rising edge) — MOV H81 D200 (Start device for storing control data)

19 Own station storage channel

MOV K1 D202

21 Target station storage channel

MOV K1 D203

A

		1	2	3	4	5	6	7	8	9	10	11	12
23											Target network No.		
24											MOV	K1	D204
25											Target station No.		
26											MOV	K2	D205
27											Number of resends		
28											MOV	K5	D207
29											Arrival monitoring time		
30											MOV	K2	D208
31											Send data length		
32											MOV	K1	D209
33											SET		M100
34	(657)	M100 ─┤├─							JP.SEND	J1	D200 Start device for storing control data	D110 Start device for storing send data	M101 Send completion
35	(667)	M101 ─┤├─ Send completion	M102 ─┤/├─ Send result error								RST		M100
36	(670)										MCR		N1
37	(671)										MCR		N0
38	(672)												[END]

■Program for the normal station (station No.2)

Project name	1Ns2 (interrupt)

1 Check of own station

		1	2	3	...	10	11	12
2	(0)	SB20 Module status	SB47 Baton pass status of own station	SB49 Data link status of own station		MC	N0	M0
3		N0 M0						

4 Check of station No.1

		1	2	3	...	10	11	12
5	(27)	SW0B0.0 Cyclic transmission status of each station				MC	N1	M1
6		N1 M1						
7	(53)	SM400 Always On						EI
8	(55)	X100				RST		Y170
9						RST		Y171
10	(58)					MCR		N1
11	(59)					MCR		N0
12	(60)							FEND

13 Interrupt processing 1) LB0 = ON Edge detection

		1	2	3	...	10	11	12
14	I50 (62)	SM400 Always On				INC		D100
15	(115)	=	D100	K10000		RST		D100

			1	2	3	4	5	6	7	8	9	10	11	12
16		(120)	SM400 Always On									MOV	D100	D0
17		(123)												IRET

18 Interrupt processing 2) LW0 = 500 Edge detection

			1	2	3	4	5	6	7	8	9	10	11	12
19	I51	(124)	SM400 Always On									INC	D101	
20		(178)	=	D101	K10000							RST	D101	
21		(183)	SM400 Always On									MOV	D101	D1
22		(186)												IRET

23 Interrupt processing 3) SB64 = ON Edge detection (When the cable is detected)

			1	2	3	4	5	6	7	8	9	10	11	12
24	I52	(187)	SM400 Always On									SET	Y170	
25		(269)												IRET

26 Interrupt processing 4) SWF0 = 1 Edge detection (When the operating status of the CPU module of the station No.1 is changed to STOP)

			1	2	3	4	5	6	7	8	9	10	11	12
27	I53	(270)	SM400 Always On									SET	Y171	
28		(407)												IRET

29 Data reception

			1	2	3	4	5	6	7	8	9	10	11	12
30	I54	(408)	SM400 Always On									MOV	K1	D112

		1	2	3	4	5	6	7	8	9	10	11	12
31									Z.RECVS	"J1"	D110	D120	M20
32	(438)	SM400 Always On										MOV	D120	D10
33	(441)													IRET
34	(442)													{END }

A

Operation method

1. Set the RUN/STOP/RESET switch of the CPU module of the control station to the "RESET" position (for approximately one second) to reset the CPU module. Then, switch it to the "RUN" position.

2. Set the RUN/STOP/RESET switch of the CPU module of the normal station to the "RESET" position (for approximately one second) to reset the CPU module. Then, switch it to the "RUN" position.

3. Interrupt processing 1) (LB0 = ON Edge detection)
Check that turning on X102 of the station number 1 executes the interrupt processing and changes the initial indication device (D0) of the station number 2.

4. Interrupt processing 2) (LW0 = 500 Edge detection)
Check that turning on X103 in the state where the initial input device (D20) of the station number 1 has been set to 500 executes the interrupt processing and changes the initial indication device (D1) of the station number 2.

5. Interrupt processing 3) (SB64 = ON Edge detection)
Check that disconnecting optical fiber cables executes the interrupt processing and turns on the lamp of the station number 2 (Y170).

6. Interrupt processing 4) (SWF0 = 1 Edge detection)
Check that changing the operating status of the CPU module of the station number 1 to the STOP state executes the interrupt processing and turns on the lamp of the station number 2 (Y171).

7. Interrupt processing 5) (Data reception)
Check that turning on X105 in the state where a numerical value has been set in the initial input device (D21) of the station number 1 executes the interrupt processing and displays the numerical value set in D21 in the initial indication device (D10) of the station number 2.

Appendix 7 Programming

Appendix 7.1 Precautions on programming

Interlock-related signals

This section provides a list of devices for interlock signals used in sequence programs.

For the operating status and setting status of the own station and other stations, refer to Page App. - 4 List of Link Special Relay (SB) Areas and Page App. - 17 List of Link Special Register (SW) Areas.

When multiple network modules are mounted, the device areas are refreshed by 512 points (0H to 1FFH) to the CPU module with the default settings as shown in the following table.

> **Point**
>
> The link special relay (SB) and link special register (SW) are used by all the intelligent function modules connected.
>
> Therefore, manage the devices correctly so that device ranges do not overlap when SB or SW is used in programs.

■Assignment of link special relay (SB)/link special register (SW) when multiple network modules are mounted

Device	Module 1	Module 2	Module 3	Module 4
SB	SB0000 to SB01FF	SB0200 to SB03FF	SB0400 to SB05FF	SB0600 to SB07FF
SW	SW0000 to SW01FF	SW0200 to SW03FF	SW0400 to SW05FF	SW0600 to SW07FF

A

■Interlock device list

No.	Name	Description
SB0020	Communication status with the CPU module	Stores the communication status between a CC-Link IE Controller Network-equipped module and a CPU module. Off: Normal On: Error
SB0047	Baton pass error status of own station	Stores the baton pass status (transient transmission availability) of the own station. Off: Normal On: Error When this relay is turned on, the cause of the error can be checked with 'Baton pass status of own station' (SW0047) and 'Cause of baton pass interruption' (SW0048). Depending on the link refresh timing, the update of 'Baton pass status of own station' (SW0047) and 'Cause of baton pass interruption' (SW0048) may be offset by one sequence scan.
SB0049	Data link error status of own station	Stores the data link status of the own station. Off: Normal On: Error When this relay is turned on, the cause of the error can be checked with 'Cause of data link stop' (SW0049). Depending on the link refresh timing, the update of 'Cause of data link stop' (SW0049) may be offset by one sequence scan.
SB00A0	Baton pass error status of each station	Stores the baton pass status of each station. Off: All stations normal On: Faulty station exists When this relay is turned on, the status of each station can be checked with 'Baton pass status of each station' (SW00A0 to SW00A7). Depending on the link refresh timing, the update of 'Baton pass status of each station' (SW00A0 to SW00A7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Reserved stations and stations higher than the maximum station number are ignored.
SB00B0	Data link error status of each station	Stores the data link status of each station. Off: All stations normal On: Faulty station exists When this relay is turned on, the status of each station can be checked with 'Data link status of each station' (SW00B0 to SW00B7). Depending on the link refresh timing, the update of 'Data link status of each station' (SW00B0 to SW00B7) may be offset by one sequence scan. (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. • Reserved stations and stations higher than the maximum station number are ignored.
SW00A0 to SW00A7	Baton pass status of each station	Stores the baton pass status of each station. 0: Baton pass normal station 1: Baton pass faulty station

For SW00A0 to SW00A7:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW00A0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW00A1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW00A2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW00A3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW00A4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW00A5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW00A6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW00A7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113

Each number in the table represents a station number. — is fixed to 0.
(Conditions)
• This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held.
• Reserved stations and stations higher than the maximum station number are ignored.

No.	Name	Description
SW00B0 to SW00B7	Data link status of each station	Stores the data link status for each station. 0: Data link normal station 1: Data link faulty station |	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
SW00B0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW00B1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW00B2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW00B3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
SW00B4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
SW00B5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
SW00B6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
SW00B7	—	—	—	—	—	—	—	—	120	119	118	117	116	115	114	113	 Each number in the table represents a station number. — is fixed to 0. When group cyclic transmission is used, a station whose shared group is different from the group of the own station is detected as a cyclic transmission error station. (Including reserved stations) (Conditions) • This relay is enabled when 'Baton pass error status of own station' (SB0047) is off. When 'Baton pass error status of own station' (SB0047) is turned on (error), data prior to error is held. • Stations higher than the maximum station number are ignored.

Interlock program example

When creating a cyclic transmission program, provide an interlock circuit with 'Data link error status of own station' (SB0049) and 'Data link status of each station' (SW00B0 to SW00B7).

Ex.

• Control station (station No.1)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB49	SW0B0.1								MC	N0	M310
2		N0 M310											
3	(4)	M300	B0	B200							MOV	D0	W0
4											SET		B0
5	(10)	B200									RST		B0
6	(12)										MCR		N0
7	(13)												[END]
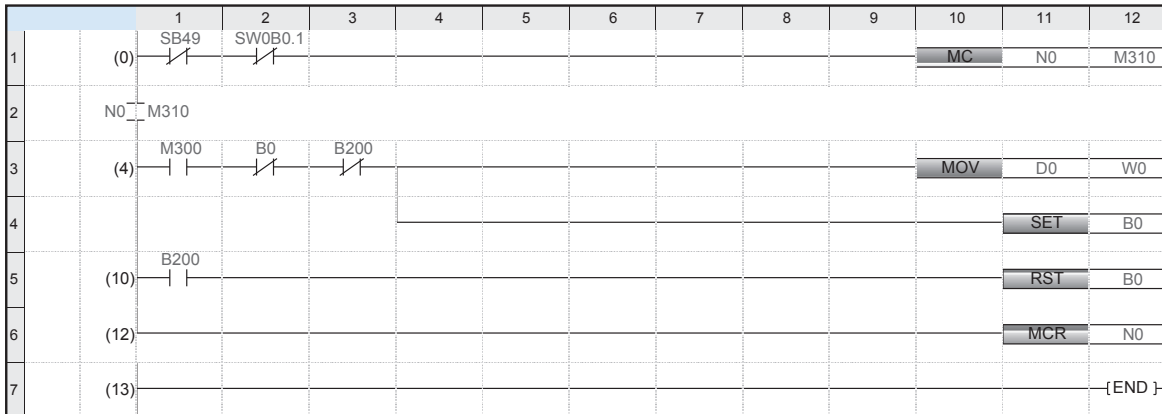
(4) When 'Send request' (M300) turns on, the data of 'Send data' (D0) is stored in 'Cyclic send data' (W0).
     When the data is stored, 'Handshake (station No.1)' (B0) turns on.
     The link relay (LB) is sent after the link register (LW) in the cyclic transmission.

(10) Data is transferred to the receiving station and 'Handshake (station No.2)' (B200) turns on. Then, 'Handshake (station No.1)'(B0) turns off.

• Normal station (station No.2)

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	SB49	SW0B0.0								MC	N0	M311
2		N0 M311											
3	(4)	B0	B200								BCD	W0	K4Y50
4											SET		B200
5	(9)	B0									RST		B200
6	(11)										MCR		N0
7	(12)												[END]
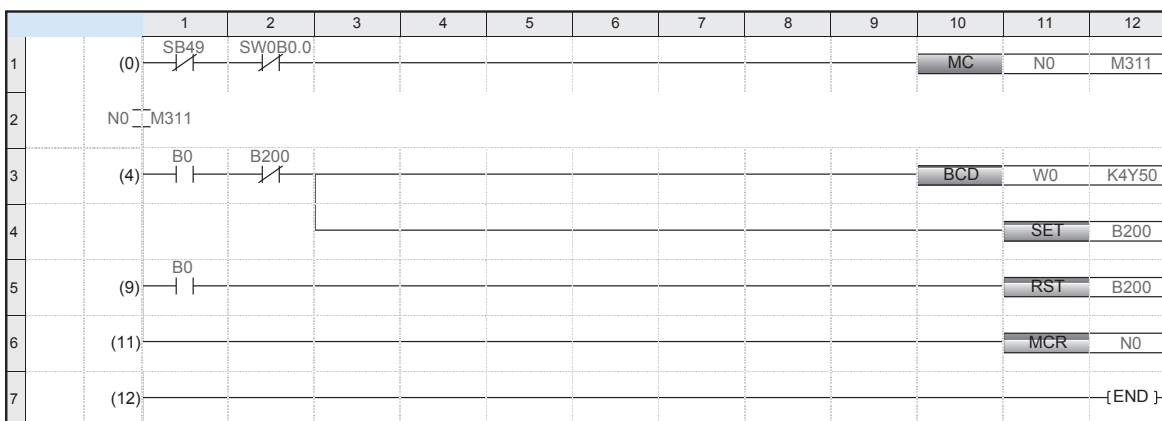
(4) When 'Handshake (station No.1)' (B0) turns on, the data of 'Cyclic receive data' (W0) is stored in 'Value indication area' (Y50 to Y5F).
     When the data is stored, 'Handshake (station No.2)' (B200) turns on.

Appendix 7.2 Cyclic transmission

Since the link scan of CC-Link IE Controller Network and the sequence scan of programmable controller is performed asynchronously, the link refresh which is performed every sequence scan is asynchronous with the link scan.

Therefore, when the following cyclic data of 32 bits (2 words) or more is handled, new and old data may be mixed depending on the link refresh timing.

 • Floating-point data
 • Current value or command speed value of a positioning module

The following functions are available for CC-Link IE Controller Network to handle the link data easily.

 • 32-bit data assurance: App. - 73 32-bit data assurance
 • Station-based block data assurance for cyclic data: App. - 74 Station-based block data assurance of cyclic data

When the condition (execution condition for 32-bit data assurance) is not satisfied, provide an interlock circuit referring to App. - 75 Interlock program example.

32-bit data assurance

This function is used to assure the link relay (LB) and link register (LW) data in units of 32 bits.

When LB and LW are set with the following four conditions satisfied, 32-bit data assurance is automatically executed.

 • The start device number of LB is a multiple of 20H.
 • The number of points assigned per station in LB is a multiple of 20H.
 • The start device number of LW is a multiple of 2.
 • The number of points assigned per station in LW is a multiple of 2.

LB and LW are specified under "Network Range Assignment" in "Required Settings" of the control station.

■Parameter settings of network range assignment

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station	32	0000	001F	2	00000	00001	No Setting	Disable	
2	Normal Station	64	0020	005F	4	00002	00005	No Setting	Disable	
3	Normal Station	96	0060	00BF	6	00006	0000B	No Setting	Disable	

For sending data of 32 bits or less, interlock programs are not required if the conditions are satisfied.
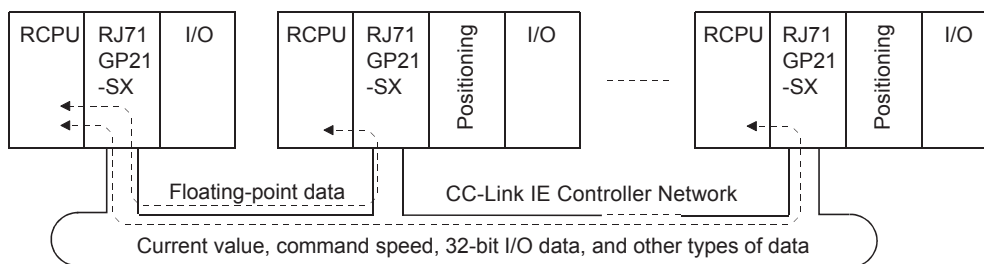
> **Point**
>
> When data of 32 bits (2 words) or more is handled, enable App. - 74 Station-based block data assurance of cyclic data or provide an interlock circuit referring to App. - 75 Interlock program example.

Station-based block data assurance of cyclic data

Integrity of the cyclic data is assured for each station by handshake between the CPU module and CC-Link IE Controller Network-equipped module for a link refresh.

■Setting

Set station-based block data assurance under "Supplementary Cyclic Settings" in "Application Settings" of the control station. Once this setting is enabled on the control station, integrity of the data for all stations is assured for each station.

■Access to link devices

During a link refresh, data is assured for each station as shown below.
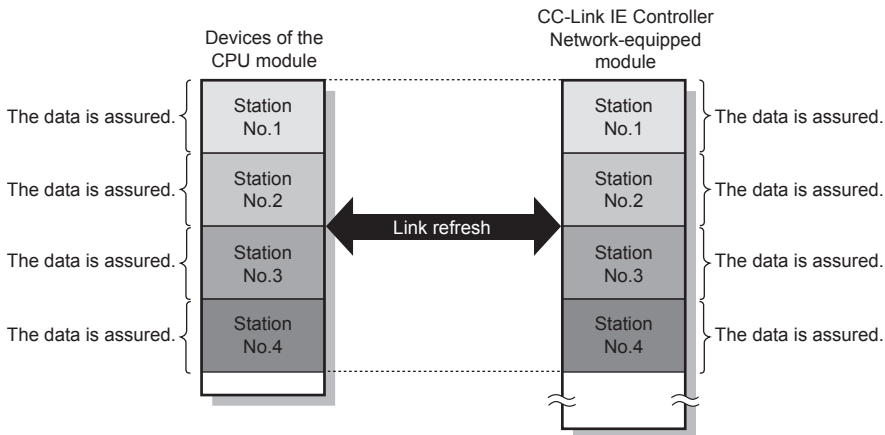
Precautions

- Set refresh parameters to execute the station-based block data assurance.
- Setting station-based block data assurance of cyclic data is not required on the normal stations.
- If a device which is set as a refresh target in the interrupt program is used, station-based block data assurance becomes disabled.

Point

Provide an interlock circuit when using the direct access to link devices (specifying J□\□) because station-based block data assurance is applied only to refresh processing.

The following shows how to calculate the transmission delay time of cyclic transmission in a single network system (with station-based block data assured).

- Sequence scan time (S_T) > Link scan time (LS)

Normal value: $(S_T + \alpha_T) \times 1.5 + LS \times 0.5 + (S_R + \alpha_R) \times 1.5$

Maximum value: $(S_T + \alpha_T) \times 2 + LS \times 1 + (S_R + \alpha_R) \times 2$

- Sequence scan time (S_T) < Link scan time (LS)

Normal value: $(S_T + \alpha_T) + LS \times 1 + (S_R + \alpha_R) \times 1.5$

Maximum value: $(S_T + \alpha_T) + LS \times 2 + (S_R + \alpha_R) \times 2$

S_T: Sequence scan time of the sending side (excluding link refresh time)

S_R: Sequence scan time of the receiving side (excluding link refresh time)

α_T: Link refresh time of the sending side (total time for the mounted network modules)

α_R: Link refresh time of the receiving side (total time for the mounted network modules)

LS: Link scan time

Interlock program example

When data of 32 bits (2 words) or more is handled without the 32-bit data assurance function or station-based block data assurance function, new and old data may be mixed.

Provide an interlock circuit with the link relay (B) as shown in the following example.

- Sending station
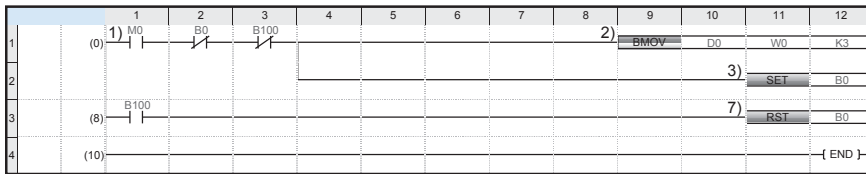
- Receiving station
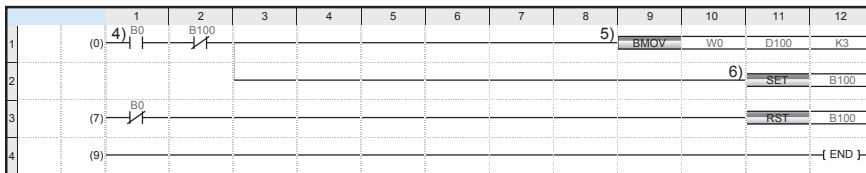
1) M0 (Send command) turns on.

2) The data of D0 to D2 is stored in W0 to W2.

3) B0 for handshake turns on when the data is stored in W0 to W2.

4) The link relay (B) is sent after the link register (W) in the cyclic transmission. B0 of the receiving station turns on.

5) The data of W0 to W2 is stored in D100 to D102.

6) B100 for handshake turns on when the data is stored in D100 to D102.

7) B0 turns off when data has been transferred to the sending station.

Appendix 7.3 Transient transmission

The following interlock circuit must be provided for transient transmission.

The network module has eight channels to execute instructions.

These eight channels can be used at the same time, but one channel cannot be used by multiple instructions at the same time.

Create the following program. In this program, the flag is on until the previous instruction is completed since the later instruction waits for the completion of the previous instruction when two instructions are executed in a channel.

Ex.
When two instructions are executed in a channel
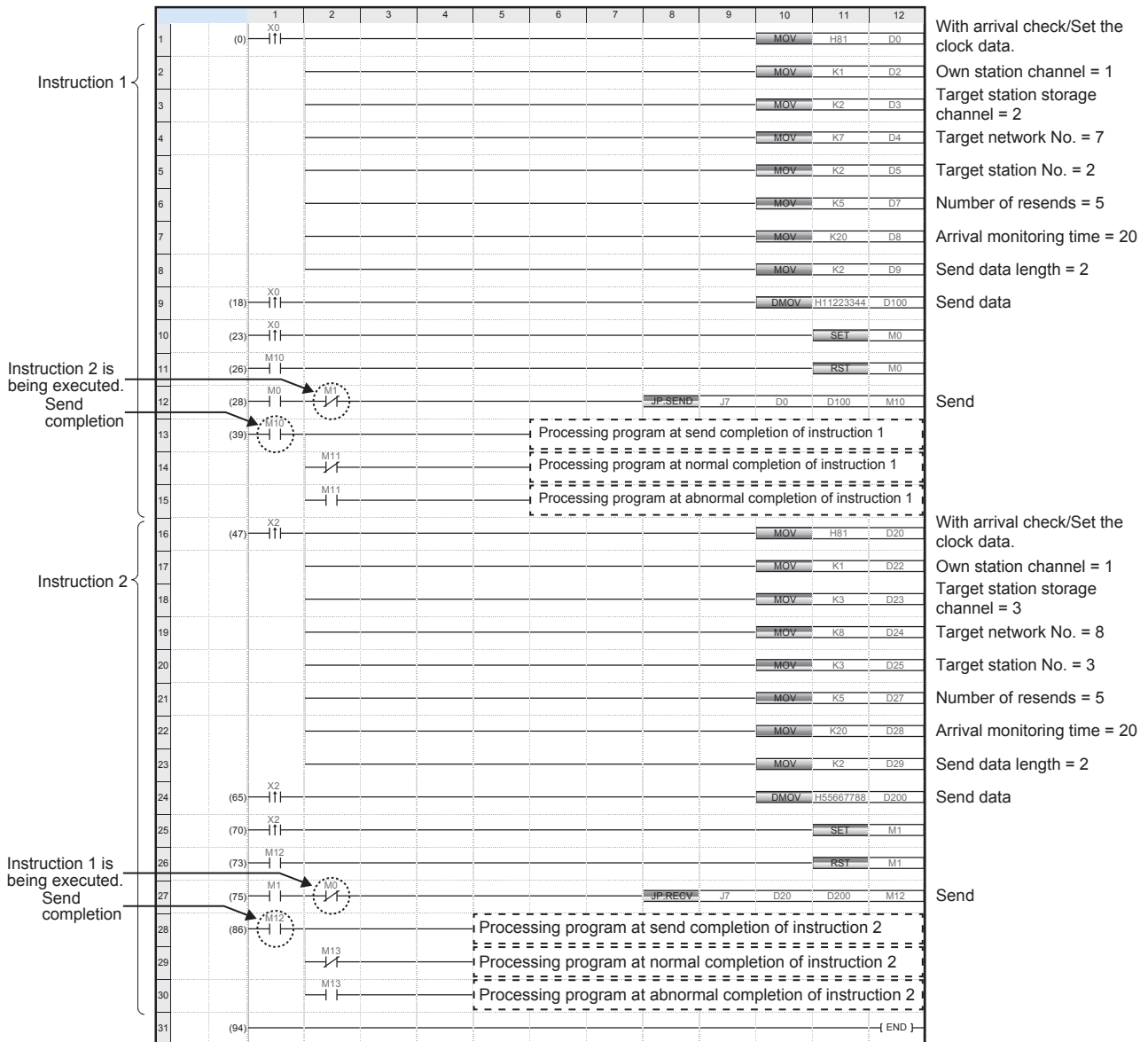
Appendix 8 Additional Exercise II (Communications Using LX and LY)

This function is used for communications between the I/O master station which controls LX and LY and another station on a one-to-one (1:1) basis.

The link input (LX) is used to send and receive input information of each station in a block. The link output (LY) is used to send and receive output information of the I/O master station.

For details, refer to the following.

📖 MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application)

(Communication example by using LX and LY)

The system configuration of the demonstration machine for Exercise I is used.

Write parameters and sequence programs to each station and check the operation.

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Setting parameters with GX Works3

Set the module parameters as follows.

For the setting operation of the module parameters, refer to Page 3 - 13 Parameter settings (control station) and Page 3 - 16 Parameter settings (normal station).

■Required Settings

• Control station (station No.1)

Item	Setting
⊟ **Station Type**	
Station Type	Control Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Station No.	1
⊟ **Network Range Assignment**	
Network Range Assignment Setting	\<Detailed Setting\>

• Normal station (station No.2)

Item	Setting
⊟ **Station Type**	
Station Type	Normal Station
⊟ **Network Number**	
Network Number	1
⊟ **Station Number**	
Setting Method	Parameter Editor
Station No.	2

■Network Range Assignment setting (control station only)

• LB/LW setting (1)

Total No. of Stations 2   Switch Windows [LB/LW Setting (1) ▼]   [Batch Setting(G)]

Station No.	Station Type	LB/LW Setting (1)						Reserved Station	Pairing	Shared Group
		LB			LW					
		Points	Start	End	Points	Start	End			
1	Control Station							No Setting	Disable	
2	Normal Station							No Setting	Disable	

• LX/LY setting (1)

Total No. of Stations 2   Switch Windows [LX/LY Setting (1) ▼]   [Batch Setting(G)]
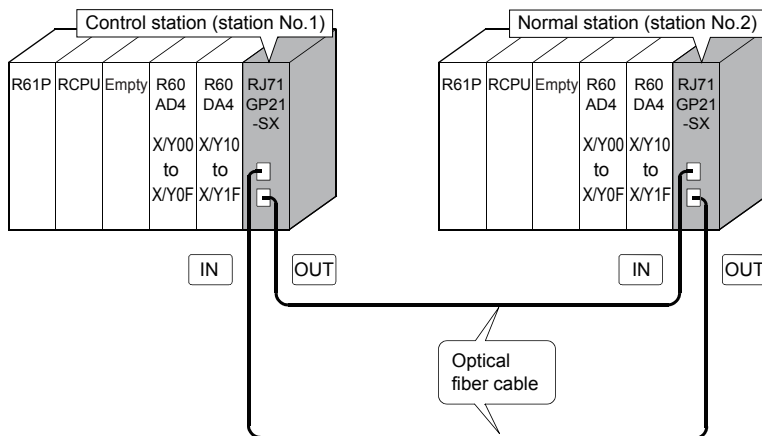
Station No.	Station Type	LX/LY Setting (1)												I/O Master Station	Reserved Station	Shared Group
		M Station->L Station						M Station<-L Station								
		LY			LX			LX			LY					
		Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End			
1	Control Station													I/O Master Station	No Setting	
2	Normal Station	256	1000	10FF	256	1000	10FF	256	1000	10FF	256	1000	10FF	No Setting	No Setting	

■Refresh Setting (common to all stations)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB ▼	512	00000	001FF	⬌	Specify Device ▼	SB ▼	512	00000	001FF
-	SW ▼	512	00000	001FF	⬌	Specify Device ▼	SW ▼	512	00000	001FF
1	LX ▼	256	01000	010FF	⬌	Specify Device ▼	X ▼	256	01000	010FF
2	LY ▼	256	01000	010FF	⬌	Specify Device ▼	Y ▼	256	01000	010FF

Sequence program

The following shows the sequence program of each station.

■Program for the control station (station No.1)

Project name	1Mp1 (LX-LY)

1 Check of own station

(0)
SB20 (Module status) /|/ — SB47 (Baton pass status of own station) /|/ — SB49 (Data link status of own station) /|/ — MC N0 M0

N0 — M0

4 Check of station No.2

(27)
SW0B0.1 (Cyclic transmission status of each station) /|/ — MC N1 M1

N1 — M1

7 Send to station No.2

(53)
X102 —| |— Y1000 (LY1000)

(77)
X103 —| |— MOVP D20 K4Y1040 (LY1040 to LY104F)

10 Reception from station No.2

(81)
X1000 (LX1000) —| |— Y170

(112)
SM400 (Always On) —| |— MOV K4X1040 (LX1040 to LX104F) D0

(115)
MCR N1

(116)
MCR N0

(117)
[END]

■Program for the normal station (station No.2)

	Project name	1Ns2 (LX-LY)

	1	2	3	4	5	6	7	8	9	10	11	12

1 Check of own station

2 (0)
SB20 (Module status) —|/|— SB47 (Baton pass status of own station) —|/|— SB49 (Data link status of own station) —|/|— ... MC N0 M0

3
N0—M0

4 Check of station No.1

5 (27)
SW0B0.0 (Cyclic transmission status of each station) —|/|— ... MC N1 M1

6
N1—M1

7 Send to station No.1

8 (53)
X102 —| |— ... Y1000 ( ) LY1000

9 (77)
X103 —| |— ... MOVP D20 K4Y1040 (LY1040 to LY104F)

10 Reception from station No.1

11 (81)
X1000 (LX1000) —| |— ... Y170 ( )

12 (112)
SM400 (Always On) —| |— ... MOV K4X1040 (LX1040 to LX104F) D0

13 (115)
... MCR N1

14 (116)
... MCR N0

15 (117)
... {END }

Operation method

1. Set the RUN/STOP/RESET switch of the CPU modules of both the control station and normal station to the "RESET" position (for approximately one second) to reset the CPU modules. Then, set it to the "RUN" position.

2. Turn on X102 of the station number 1.
Check that turning on Y1000 of the station number 1 turns on the lamp of the station number 2 (Y170).

3. Turn on X103 in the state where a numerical value has been set in the initial input device (D20) of the station number 1.
Check that the numerical value set in D20 is displayed in the initial indication device (D0) of the station number 2 when data is stored in Y1020 to Y102F of the station number 1.

4. Turn on X102 of the station number 2.
Check that turning on Y1000 of the station number 2 turns on the lamp of the station number 1 (Y170).

5. Turn on X103 in the state where a numerical value has been set in the initial input device (D20) of the station number 2.
Check that the numerical value set in D20 is displayed in the initial indication device (D0) of the station number 1 when data is stored in Y1020 to Y102F of the station number 2.

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Mitsubishi Programmable Controllers Training Manual
CC-Link IE Controller Network (for GX Works3)

MITSUBISHI ELECTRIC CORPORATION

When exported from Japan, this manual does not require application to the
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