



Programmable Controller

MELSEC iQ-F
series

MELSEC iQ-F
FX5 User's Manual (CC-Link IE TSN)

WHEN USING A SWITCHING HUB WITH CC-Link IE TSN

To connect modules on CC-Link IE TSN, a dedicated TSN switching hub may be required depending on parameter settings or the network topology used.

Read the following carefully.

☞ Page 74 Structure of Authentication Class B/A Devices and Ethernet Devices

☞ Page 88 Switching hub

SAFETY PRECAUTIONS

(Read these precautions before use.)

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

This manual classifies the safety precautions into two categories: [⚠ WARNING] and [⚠ CAUTION].

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Depending on the circumstances, procedures indicated by [⚠ CAUTION] may also cause severe injury.

It is important to follow all precautions for personal safety.

Store this manual in a safe place so that it can be read whenever necessary. Always forward it to the end user.

[Design Precautions]

WARNING

- Make sure to set up the following safety circuits outside the programmable controller to ensure safe system operation even during external power supply problems or programmable controller failure. Otherwise, malfunctions may cause serious accidents.
 - Most importantly, set up the following: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits).
 - Note that when the CPU module detects an error, such as a watchdog timer error, during self-diagnosis, all outputs are turned off. - Also, when an error that cannot be detected by the CPU module occurs in an input/output control block, output control may be disabled. External circuits and mechanisms should be designed to ensure safe machinery operation in such a case.
 - Note that when an error occurs in a relay or transistor of an output circuit, the output might stay on or off. For output signals that may lead to serious accidents, external circuits and mechanisms should be designed to ensure safe machinery operation in such a case.
- In an output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- For the operating status of each station after a communication failure, refer to manuals relevant to the network. Incorrect output or malfunction may result in an accident.
- Construct an interlock circuit in the program so that the whole system always operates on the safe side before executing the control (for data change) of the programmable controller in operation. Read the manual thoroughly and ensure complete safety before executing other controls (for program change, parameter change, forcible output and operation status change) of the programmable controller in operation. Otherwise, the machine may be damaged and accidents may occur due to erroneous operations.
- Especially, in the case of a control from an external device to a remote programmable controller, immediate action cannot be taken for a problem on the programmable controller due to a communication failure. Determine the handling method as a system when communication failure occurs along with configuration of interlock circuit on a program, by considering the external equipment and CPU module.
- Do not write any data to the "system area" and "write-protect area" of the buffer memory in the module. Executing data writing to the "system area" or "write protect area" may cause malfunction of the programmable controller alarm. For the "system area" or "write-protect area", refer to  Page 184 Buffer Memory.
- If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Construct an interlock circuit in the program so that the system always operates on the safe side even if communications fail. Incorrect output or malfunction may result in an accident.
- To maintain the safety of the programmable controller system against unauthorized access from external devices via the network, take appropriate measures. To maintain the safety against unauthorized access via the Internet, take measures such as installing a firewall.

[Design Precautions]

⚠ CAUTION

- Do not bundle the control line and communication cables together with or lay them close to the main circuit or power line. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- Simultaneously turn on and off the power supplies of the CPU module and extension modules.

[Installation Precautions]

⚠ WARNING

- Make sure to cut off all phases of the power supply externally before attempting installation or wiring work. Failure to do so may cause electric shock or damage to the product.
- Use the product within the generic environment specifications described in the User's Manual (Hardware) of the CPU module used.
Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl₂, H₂S, SO₂ or NO₂), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind.
If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur.

[Installation Precautions]

⚠ CAUTION

- Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits of the programmable controller. Failure to do so may cause fire, equipment failures or malfunctions.
- For the product supplied together with a dust proof sheet, the sheet should be affixed to the ventilation slits before the installation and wiring work to prevent foreign objects such as cutting and wiring debris.
However, when the installation work is completed, make sure to remove the sheet to provide adequate ventilation. Failure to do so may cause fire, equipment failures or malfunctions.
- Install the product on a flat surface. If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities.
- Install the product securely using a DIN rail or mounting screws.
- Work carefully when using a screwdriver such as installation of the product. Failure to do so may cause damage to the product or accidents.
- Connect the extension cables, peripheral device cables, input/output cables and battery connecting cable securely to their designated connectors. Loose connections may cause malfunctions.
- Turn off the power to the programmable controller before attaching or detaching the following devices. Failure to do so may cause device failures or malfunctions.
 - Peripheral devices, expansion board, expansion adapter, and connector conversion adapter
 - Extension modules, bus conversion module, and connector conversion module
 - Battery

[Wiring Precautions]

⚠️ WARNING

- Make sure to cut off all phases of the power supply externally before attempting installation or wiring work. Failure to do so may cause electric shock or damage to the product.
- Make sure to attach the terminal cover, provided as an accessory, before turning on the power or initiating operation after installation or wiring work. Failure to do so may cause electric shock.
- The temperature rating of the cable should be 80°C or more.
- Make sure to wire the screw terminal block in accordance with the following precautions. Failure to do so may cause electric shock, equipment failures, a short-circuit, wire breakage, malfunctions, or damage to the product.
 - The disposal size of the cable end should follow the dimensions described in the User's Manual (Hardware) of the CPU module used.
 - Tightening torque should follow the specifications in the User's Manual (Hardware) of the CPU module used.
 - Tighten the screws using a Phillips-head screwdriver No.2 (shaft diameter 6mm or less). Make sure that the screwdriver does not touch the partition part of the terminal block.

[Wiring Precautions]

⚠️ CAUTION

- Perform class D grounding (grounding resistance: 100Ω or less) of the grounding terminal on the CPU module and extension modules with a wire 2mm² or thicker.
Do not use common grounding with heavy electrical systems (refer to the User's Manual (Hardware) for the CPU module used).
- Connect the power supply wiring to the dedicated terminals described in this manual. If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the programmable controller will burn out.
- Do not wire vacant terminals externally. Doing so may damage the product.
- Install module so that excessive force will not be applied to terminal blocks, power connectors, I/O connectors, communication connectors, or communication cables. Failure to do so may result in wire damage/breakage or programmable controller failure.
- Make sure to observe the following precautions in order to prevent any damage to the machinery or accidents due to malfunction of the programmable controller caused by abnormal data written to the programmable controller due to the effects of noise:
 - Do not bundle the power line, control line and communication cables together with or lay them close to the main circuit, high-voltage line, load line or power line. As a guideline, lay the power line, control line and connection cables at least 100mm away from the main circuit, high-voltage line, load line or power line.
 - Ground the shield of the shielded wire or shield cable at one point on the programmable controller. However, do not use common grounding with heavy electrical systems.
- For Ethernet cables to be used in the system, select the ones that meet the specifications in this manual. If not, normal data transmission is not guaranteed.

[Startup and Maintenance Precautions]

⚠️ WARNING

- Do not touch any terminal while the programmable controller's power is on. Doing so may cause electric shock or malfunctions.
- Before cleaning or retightening terminals, cut off all phases of the power supply externally. Failure to do so in the power ON status may cause electric shock.
- Before modifying the program in operation, forcible output, running or stopping the programmable controller, read through this manual carefully, and ensure complete safety. An operation error may damage the machinery or cause accidents.
- Do not change the program in the programmable controller from two or more peripheral equipment devices at the same time. (i. e. from an engineering tool and a GOT) Doing so may cause destruction or malfunction of the programmable controller program.

[Startup and Maintenance Precautions]

⚠️ CAUTION

- Do not disassemble or modify the programmable controller. Doing so may cause fire, equipment failures, or malfunctions.
For repair, consult your local Mitsubishi Electric representative.
- Turn off the power to the programmable controller before connecting or disconnecting any extension cable. Failure to do so may cause device failures or malfunctions.
- Turn off the power to the programmable controller before attaching or detaching the following devices. Failure to do so may cause device failures or malfunctions.
 - Peripheral devices, expansion board, expansion adapter, and connector conversion adapter
 - Extension modules, bus conversion module, and connector conversion module
 - Battery

[Operating Precautions]

⚠️ CAUTION

- Construct an interlock circuit in the program so that the whole system always operates on the safe side before executing the control (for data change) of the programmable controller in operation. Read the manual thoroughly and ensure complete safety before executing other controls (for program change, parameter change, forcible output and operation status change) of the programmable controller in operation. Otherwise, the machine may be damaged and accidents may occur due to erroneous operations.

[Disposal Precautions]

⚠️ CAUTION

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.

[Transportation Precautions]

CAUTION

- The programmable controller is a precision instrument. During transportation, avoid impacts larger than those specified in the general specifications of the User's Manual (Hardware) of the CPU module used by using dedicated packaging boxes and shock-absorbing palettes. Failure to do so may cause failures in the programmable controller. After transportation, verify operation of the programmable controller and check for damage of the mounting part, etc.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric MELSEC iQ-F series programmable controllers.

This manual contains text, diagrams and explanations which will guide the reader in the correct installation, safe use and operation of the CC-Link IE TSN module of MELSEC iQ-F series and should be read and understood before attempting to install or use the module.

Always forward it to the end user.

Regarding use of this product

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

Note

- If in doubt at any stage during the installation of the product, always consult a professional electrical engineer who is qualified and trained in the local and national standards. If in doubt about the operation or use, please consult the nearest Mitsubishi Electric representative.
- Since the examples indicated by this manual, technical bulletin, catalog, etc. are used as a reference, please use it after confirming the function and safety of the equipment and system. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.
- This manual content, specification etc. may be changed, without a notice, for improvement.
- The information in this manual has been carefully checked and is believed to be accurate; however, if you notice a doubtful point, an error, etc., please consult your local Mitsubishi Electric representative. When doing so, please provide the manual number given at the end of this manual.

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RELEVANT MANUALS

Manual name (manual number)	Description
MELSEC iQ-F FX5 User's Manual (Startup) <JY997D58201>	Performance specifications, procedures before operation, and troubleshooting of the FX5 CPU module
MELSEC iQ-F FX5UJ User's Manual (Hardware) <SH-082206ENG>	Details of hardware of the FX5UJ CPU module, including I/O specifications, wiring, installation, and maintenance
MELSEC iQ-F FX5U User's Manual (Hardware) <JY997D55301>	Details of hardware of the FX5U CPU module, including I/O specifications, wiring, installation, and maintenance
MELSEC iQ-F FX5UC User's Manual (Hardware) <JY997D61401>	Details of hardware of the FX5UC CPU module, including I/O specifications, wiring, installation, and maintenance
MELSEC iQ-F FX5 User's Manual (Application) <JY997D55401>	Basic knowledge about programming, functions of the CPU module, devices/labels, and parameter settings
MELSEC iQ-F FX5 Programming Manual (Program Design) <JY997D55701>	Program specifications, such as ladder diagrams, ST, and FBD/LD programs, and labels
MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks) <JY997D55801>	Specifications of the instructions and functions that can be used in programs
MELSEC iQ-F FX5 User's Manual (Serial Communication) <JY997D55901>	N:N Network, parallel link, MC protocol, inverter communication, non-protocol communication, and predefined protocol support
MELSEC iQ-F FX5 User's Manual (MELSEC Communication Protocol) <JY997D60801>	Methods for the external device to read/write CPU module data through communications that use the MC protocol
MELSEC iQ-F FX5 User's Manual (MODBUS Communication) <JY997D56101>	MODBUS serial communications and MODBUS/TCP communications
MELSEC iQ-F FX5 User's Manual (PROFIBUS) <SH-081910ENG>	Description of the PROFIBUS-DP master module
MELSEC iQ-F FX5 User's Manual (Ethernet Communication) <JY997D56201>	The Ethernet communication function available with the CPU module and Ethernet module
MELSEC iQ-F FX5-ENET User's Manual <SH-082026ENG>	Description of the Ethernet module
MELSEC iQ-F FX5-ENET/IP User's Manual <SH-082027ENG>	Description of the FX5-ENET/IP
MELSEC iQ-F FX5 User's Manual (SLMP) <JY997D56001>	Methods for the external device to read/write CPU module data through communications that use the SLMP
MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) <SH-082215ENG> (This manual)	Description of the CC-Link IE TSN module
MELSEC iQ-F FX5 User's Manual (CC-Link IE) <JY997D64201>	Description of the CC-Link IE Field Network module
MELSEC iQ-F FX5 User's Manual (CC-Link) <SH-081793ENG>	Description of the CC-Link system master/intelligent device module
MELSEC iQ-F FX5 User's Manual (AnyWireASLINK) <SH-081796ENG>	Description of the AnyWireASLINK system master module
MELSEC iQ-F FX5 User's Manual (Positioning Control - CPU module built-in, High-speed pulse input/output module) <JY997D56301>	The positioning function available with the CPU module and high-speed pulse I/O module
MELSEC iQ-F FX5 User's Manual (Positioning Control - Intelligent function module) <SH-081805ENG>	Description of the positioning module
MELSEC iQ-F FX5 Simple Motion Module User's Manual (Startup) <IB-0300251ENG>	Specifications, procedures before operation, wiring, system configuration, wiring, and operation examples of the Simple Motion module
MELSEC iQ-F FX5 Simple Motion Module User's Manual (Application) <IB-0300253ENG>	Functions, I/O signals, buffer memory, parameter settings, programming, and troubleshooting of the Simple Motion module
MELSEC iQ-F FX5 Simple Motion Module User's Manual (Advanced Synchronous Control) <IB-0300255ENG>	Functions of synchronous control and programming of the Simple Motion module
MELSEC iQ-F FX5 User's Manual (Analog Control - CPU module built-in, Expansion adapter) <JY997D60501>	The analog function available with the CPU module and analog adapter
MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module) <SH-081802ENG>	Description of the analog input module, analog output module, and multiple input module

Manual name (manual number)	Description
MELSEC iQ-F FX5 User's Manual (Temperature Control) <SH-081799ENG>	Description of the temperature control module
MELSEC iQ-F FX5 User's Manual (Safety Control) <SH-082078ENG>	Description of the safety extension module
GX Works3 Operating Manual <SH-081215ENG>	Explanation of system configuration, parameter settings, and online operations of GX Works3
Transition from MELSEC FX3G, FX3U, FX3UC Series to MELSEC iQ-F Series Handbook <JY997D66201>	Description of the replacement from the MELSEC FX3G, FX3U, FX3UC series to the MELSEC iQ-F series

TERMS

Unless otherwise specified, this manual uses the following terms.

- For details on FX3 devices that can connect to the FX5 CPU module, refer to the user's manual (hardware) for the CPU module used.

Term	Description
■Device	
FX5	A generic term for the programmable controllers: FX5UJ, FX5U, and FX5UC
FX3	A generic term for the programmable controllers: FX3S, FX3G, FX3GC, FX3U, and FX3UC
FX5 CPU module	A generic term for the FX5UJ CPU module, FX5U CPU module, and FX5UC CPU module
FX5UJ CPU module	A generic term for the FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, and FX5UJ-60MT/ESS
FX5U CPU module	A generic term for the FX5U-32MR/ES, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/ES, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/ES, FX5U-80MT/ES, FX5U-80MT/ESS, FX5U-32MR/DS, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-64MR/DS, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-80MR/DS, FX5U-80MT/DS, and FX5U-80MT/DSS
FX5UC CPU module	A generic term for the FX5UC-32MT/D, FX5UC-32MT/DSS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS-TS, and FX5UC-32MR/DS-TS
Extension module	A generic term for the FX5 extension modules, FX3 extension modules, extension modules (extension cable type), and extension modules (extension connector type)
• FX5 extension module	A generic term for the I/O modules, FX5 extension power supply modules, FX5 intelligent function modules, and FX5 safety extension modules
• FX3 extension module	A generic term for the FX3 extension power supply modules and FX3 intelligent function modules
• Extension module (extension cable type)	A generic term for the input modules (extension cable type), output modules (extension cable type), I/O modules (extension cable type), powered I/O modules, high-speed pulse I/O modules, extension power supply modules (extension cable type), connector conversion modules (extension cable type), intelligent function modules, safety extension modules, and bus conversion modules
• Extension module (extension connector type)	A generic term for the input modules (extension connector type), output modules (extension connector type), I/O modules, extension power supply modules (extension connector type), bus conversion modules (extension connector type), and connector conversion modules (extension connector type) connector type)
I/O module	A generic term for the input modules, output modules, I/O modules, powered I/O modules, and high-speed pulse I/O modules
Input module	A generic term for the input modules (extension cable type) and input modules (extension connector type)
• Input module (extension cable type)	A generic term for the FX5-8EX/ES and FX5-16EX/ES
• Input module (extension connector type)	A generic term for the FX5-C16EX/D, FX5-C16EX/DS, FX5-C32EX/D, FX5-C32EX/DS, and FX5-C32EX/DS-TS
Output module	A generic term for the output modules (extension cable type) and output modules (extension connector type)
• Output module (extension cable type)	A generic term for the FX5-8EYR/ES, FX5-8EYT/ES, FX5-8EYT/ESS, FX5-16EYR/ES, FX5-16EYT/ES, and FX5-16EYT/ESS
• Output module (extension connector type)	A generic term for the FX5-C16EYT/D, FX5-C16EYT/DSS, FX5-C16EYR/D-TS, FX5-C32EYT/D, FX5-C32EYT/DSS, FX5-C32EYT/D-TS, and FX5-C32EYT/DSS-TS
I/O module	A generic term for the I/O modules (extension cable type) and I/O modules (extension connector type)
I/O module (extension cable type)	A generic term for the FX5-16ER/ES, FX5-16ET/ES, and FX5-16ET/ESS
I/O module (extension connector type)	A generic term for the FX5-C32ET/D, FX5-C32ET/DSS, FX5-C32ET/DS-TS, and FX5-C32ET/DSS-TS
Powered I/O module	A generic term for the FX5-32ER/ES, FX5-32ET/ES, FX5-32ET/ESS, FX5-32ER/DS, FX5-32ET/DS, and FX5-32ET/DSS
High-speed pulse I/O module	A generic term for the FX5-16ET/ES-H and FX5-16ET/ESS-H
Extension power supply module	A generic term for the FX5 extension power supply modules and FX3 extension power supply modules

Term	Description
FX5 extension power supply module	A generic term for the FX5 extension power supply modules (extension cable type) and FX5 extension power supply modules (extension connector type)
• FX5 extension power supply module (extension cable type)	Another term for the FX5-1PSU-5V
• FX5 extension power supply module (extension connector type)	Another term for the FX5-C1PS-5V
• FX3 extension power supply module	Another term for the FX3U-1PSU-5V
Intelligent module	The abbreviation for the intelligent function module
Intelligent function module	A generic term for the FX5 intelligent function modules and FX3 intelligent function modules
• FX5 intelligent function module	A generic term for the FX5-4AD, FX5-4DA, FX5-8AD, FX5-4LC, FX5-20PG-P, FX5-20PG-D, FX5-40SSC-S, FX5-80SSC-S, FX5-ENET, FX5-ENET/IP, FX5-CCLIEF, FX5-CCL-MS, FX5-ASL-M, FX5-DP-M, and FX5-CCLGN-MS
• FX3 intelligent function module	A generic term for the FX3U-4AD, FX3U-4DA, FX3U-4LC, FX3U-1PG, FX3U-2HC, FX3U-16CCL-M, FX3U-64CCL, FX3U-128BTY-M, FX3U-128ASL-M, and FX3U-32DP
FX5 safety extension module	A generic term for the safety main modules and safety expansion modules
Safety main module	Another term for the FX5-SF-MU4T5
Safety expansion module	A generic term for the expansion module mounted to the safety main module
Safety input expansion module	Another term for the FX5-SF-8DI4
Expansion board	A generic term for the FX5UJ CPU module board and FX5U CPU module board
• Communication board	A generic term for the FX5-232-BD, FX5-485-BD, and FX5-422-BD-GOT
Expansion adapter	A generic term for the FX5 CPU module adapter
• Communication adapter	A generic term for the FX5-232ADP and FX5-485ADP
• Analog adapter	A generic term for the FX5-4AD-ADP, FX5-4DA-ADP, FX5-4AD-PT-ADP, and FX5-4AD-TC-ADP
Bus conversion module	A generic term for the bus conversion module (extension cable type) and bus conversion module (extension connector type)
• Bus conversion module (extension cable type)	Another term for the FX5-CNV-BUS
• Bus conversion module (extension connector type)	Another term for the FX5-CNV-BUSC
Connector conversion module	A generic term for the connector conversion modules (extension cable type) and connector conversion modules (extension connector type)
• Connector conversion module (extension cable type)	Another term for the FX5-CNV-IF
• Connector conversion module (extension connector type)	Another term for the FX5-CNV-IFC
Extension cable	A generic term for the FX5-30EC and FX5-65EC
Connector conversion adapter	Another term for the FX5-CNV-BC
Battery	Another term for the FX3U-32BL
SD memory card	A generic term for the memory cards: NZ1MEM-2GBSD, NZ1MEM-4GBSD, NZ1MEM-8GBSD, NZ1MEM-16GBSD, L1MEM-2GBSD, and L1MEM-4GBSD SD memory card means Secure Digital Memory Card. A storage medium consisting of flash memory
Peripheral	A generic term for the engineering tool and GOT
Ethernet-equipped module	A generic term for the following modules when the Ethernet communication function is used: • CPU module • FX5-ENET • FX5-ENET/IP
GOT	A generic term for the Mitsubishi Electric Graphic Operation Terminal, GOT1000 and GOT2000 series
■Software package	
Engineering tool	The product name of the software package for the MELSEC programmable controllers
GX Works3	A generic term for the product model name SWnDND-GXW3 (n represents the version.)

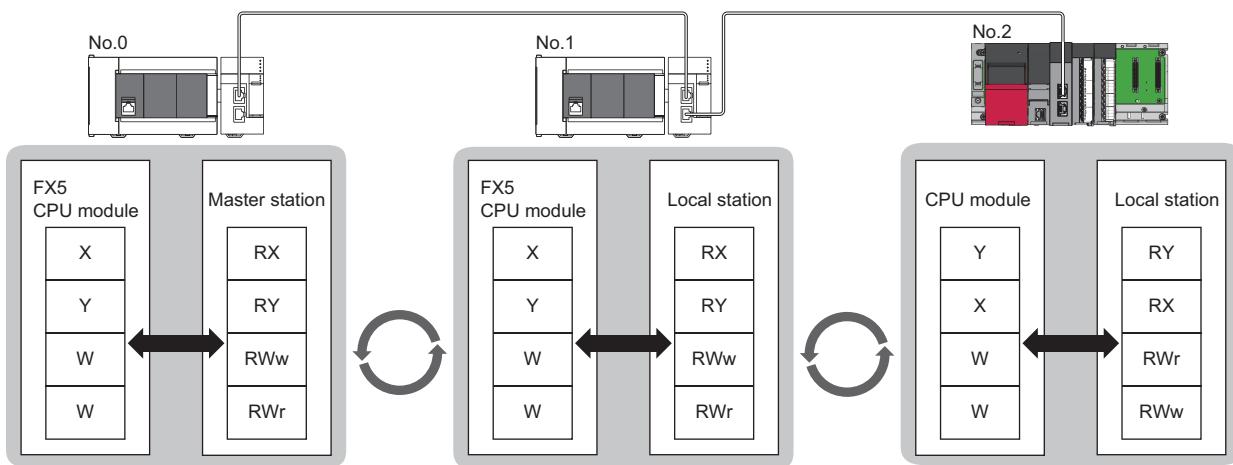
1 OVERVIEW

- CC-Link IE TSN is a high-speed (1Gbps) and large-capacity open field network that is based on Ethernet (1000BASE-T).
- The FX5-CCLGN-MS master/local module for CC-Link IE TSN (hereinafter referred to as FX5-CCLGN-MS) is an intelligent function module for connecting to CC-Link IE TSN as a master or local station.
- Wiring of CC-Link IE TSN supports a star topology, line topology, and coexistence of line and star topologies.
- Data can be communicated between the FX5 CPU module and FX5-CCLGN-MS using the FROM/TO instructions via the buffer memory. In addition, data can be used in a program by being replaced with data in internal devices, such as X, Y, B, W, SB, and SW, using the auto refresh function.

Data communication

■Cyclic transmission

Data is periodically communicated among stations on the network using link devices.



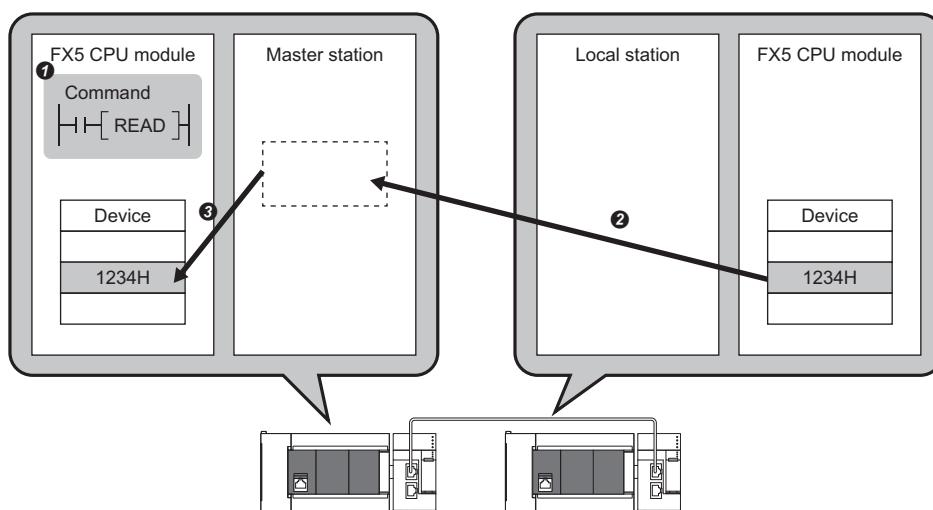
No.0: station number 0

No.1: station number 1

No.2: station number 2

■Transient transmission

Data is read/written from the master station or local station to devices in a CPU module of the local station or the buffer memory areas of a remote station using the dedicated instructions.



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2 SPECIFICATIONS

This chapter describes the specifications of the FX5-CCLGN-MS.

2.1 General Specifications

The general specifications of the FX5-CCLGN-MS other than the following are same as those of the FX5 CPU module to be connected.

For the general specifications, refer to the following.

BOOK MELSEC iQ-F FX5U User's Manual (Hardware)

BOOK MELSEC iQ-F FX5UC User's Manual (Hardware)

Item	Specifications	
Operating ambient temperature	-20 to 50°C ^{*1}	
Withstand voltage	500VAC for 1 minute	Between all terminals and ground terminal
Insulation resistance	10MΩ or higher by 500VDC insulation resistance tester	

*1 When using FX5-CCLGN-MS in a programmable controller system, the operating ambient temperature for the programmable controller system must be -20 to 50°C.

2.2 Power Supply Specifications

The following table lists the power supply specifications.

Item	Specifications	
External power supply	Power supply voltage	24VDC +20%/-15%
	Allowable instantaneous power failure time	Operation continues for an instantaneous power failure of 1ms or less.
	Current consumption	220mA

2.3 Performance Specifications of CC-Link IE TSN

The following table lists the performance specifications of CC-Link IE TSN for the FX5-CCLGN-MS.

Item	Description		
Station type	Master or local station		
Station number	<ul style="list-style-type: none">Master station: 0Local station: 1 to 120		
Number of connectable modules	<ul style="list-style-type: none">One module can be connected to the CPU module for each station type.Master station: 1Local station: 1		
Maximum number of link points per network	RX	16K points (16384 points, 2K bytes)	
	RY	16K points (16384 points, 2K bytes)	
	RWr	8K points (8192 points, 16K bytes)	
	RWw	8K points (8192 points, 16K bytes)	
Maximum number of link points per station ^{*1}	Master station	RX	8K points (8192 points, 1K bytes)
		RY	8K points (8192 points, 1K bytes)
		RWr	4K points (4096 points, 8K bytes)
		RWw	4K points (4096 points, 8K bytes)
	Local station	RX	16K points (16384 points, 2K bytes)
		RY	16K points (16384 points, 2K bytes)
		RWr	8K points (8192 points, 16K bytes)
		RWw	8K points (8192 points, 16K bytes)
Communication speed	1Gbps		
Minimum synchronization cycle	250.00μs		

Item		Description
Authentication Class		Authentication Class B device
Maximum number of connectable stations	When used as a master station	61
	When used as a local station	121
Station-based data assurance	When used as a master station	61
	When used as a local station	121
Communication cable		Ethernet cable which satisfies standard: (☞ Page 88 Ethernet cable)
Overall cable distance	Line topology	12000m (when 121 stations are connected)
	Others	Depends on the system configuration.
Maximum station-to-station distance		100m
Network number setting range		1 to 239
Network topology		Line topology, star topology (Coexistence of line topology and star topology is also possible.)
Communication method		Time sharing method
Transient transmission capacity		1920 bytes
Number of I/O points		8 points
Applicable CPU module		FX5U CPU module (Version 1.210 or later) FX5UC CPU module ^{*2} (Version 1.210 or later)
Applicable engineering tool		GX Works3 version 1.065T or later (for FX5U CPU module) GX Works3 version 1.065T or later (for FX5UC CPU module)

*1 The maximum number of points for all link devices may not be used simultaneously depending on the number of slave stations, or the number of points and assignments of the link devices that are set in the "Network Configuration Settings" of the "Basic Settings".

*2 To connect the FX5-CCLGN-MS to the FX5UC CPU module, the FX5-CN1-IFC and FX5-C1PS-5V are required.

2.4 Performance Specifications of Ethernet

The following table lists the performance specifications of Ethernet for the FX5-CCLGN-MS.

Item		Description	
Data transmission speed		1Gbps	
Communication mode		1000BASE-T	Full-duplex
Interface		RJ45 connector (Auto MDI/MDI-X)	
Maximum frame size		1518 bytes	
Maximum segment length		100m ^{*1}	
Number of cascade connections	1000BASE-T	^{*2}	
IP version		IPv4	
Number of simultaneous open connections (maximum number of connections)	Connection with MELSOFT products	8 connections ^{*3}	
	Connection to SLMP-compatible devices	8 connections ^{*3}	

*1 For maximum segment length (length between switching hubs), consult the manufacturer of the switching hub used.

*2 Consult the manufacturer of the switching hub used.

*3 In the case of one connection per device, up to eight devices can be connected.

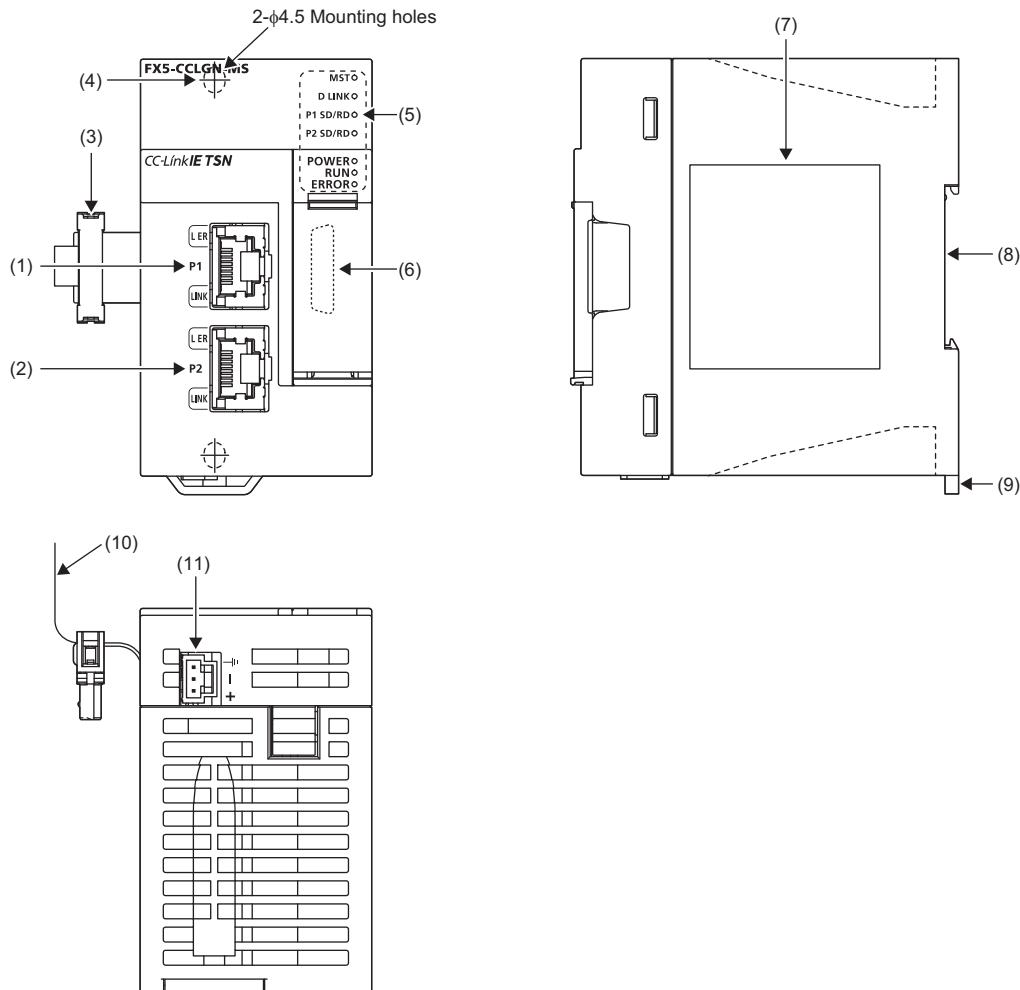


The operation of commercial devices used for the following applications is not guaranteed. Check the operation before using the module.

- Internet (general public line) (Internet-access service offered by an Internet service provider or a telecommunications carrier)
- Firewall device(s)
- Broadband router(s)
- Wireless LAN

2.5 Part Names

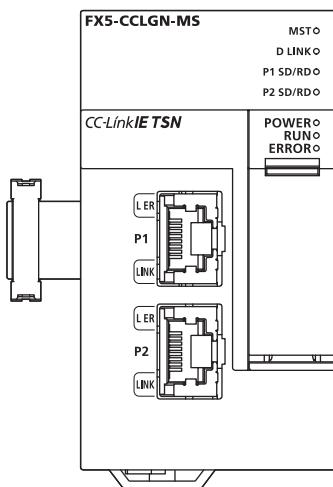
This section describes the part names of the FX5-CCLGN-MS.



No.	Name	Description
(1)	Modular jack for P1 (RJ45) (with cap)	A port for CC-Link IE TSN connection. Connects an Ethernet cable. For wiring methods and wiring precautions, refer to the following. Page 85 WIRING
(2)	Modular jack for P2 (RJ45) (with cap)	Same as the modular jack for P1 (RJ45)
(3)	Extension cable	A cable for connecting a module when adding the FX5-CCLGN-MS
(4)	Hole for direct installation	A screw hole for direct installation (2-φ4.5, Installation screw: M4 screw)
(5)	Operation status display LEDs	Indicate the operating status of the module. For details, refer to the following. Page 19 LED indication
(6)	Extension connector	A connector for connecting an extension cable of an extension module
(7)	Nameplate	Displays product model, manufacturer serial number, power supply specifications, and MAC address.
(8)	DIN rail mounting groove	Used for mounting a module onto a DIN46277 (width: 35mm) DIN rail
(9)	DIN rail mounting hook	Used for mounting a module onto a DIN46277 (width: 35mm) DIN rail
(10)	Pullout tab	Used for drawing out an extension cable
(11)	Power connector	A connector for connecting a power cable

LED indication

The following table lists the LED indications.



LED name	LED color	Description
MST	Green	Indicates the operating status. On: Operating as a master station Off: Operating as a local station
D LINK ^{*1}	Green	Indicates the cyclic transmission status. On: Cyclic transmission being performed Flashing: Cyclic transmission stopped Off: Disconnected
P1 SD/RD	Green	Indicates the data sending/receiving status. On: Data ^{*2} being sent or received Off: Data ^{*2} neither sent nor received
P2 SD/RD	Green	Indicates the data sending/receiving status. On: Data ^{*2} being sent or received Off: Data ^{*2} neither sent nor received
POWER	Green	Indicates the power supply status. On: Power-on Off: Power-off
RUN	Green	Indicates the operating status. On: Normal operation Flashing: Module communication test Off: Error
ERROR ^{*1}	Red	Indicates the error status. On: Error, or error detection in progress on all stations Flashing (500ms interval): Detection of a data link faulty station in progress <ul style="list-style-type: none"> • Unicast mode: Flashing only at the master station • Multicast mode: Flashing at the master station and local station. However, the LED does not flash at the local station if a data link error occurs at the authentication Class A remote station during data link. (The LED remains off.) Flashing (200ms interval): Error Off: Normal operation
P1	L ER ^{*1}	Red Indicates the port status of P1. On: Abnormal data received Off: Normal data received
	LINK	Green Indicates the link status of P1. On: Link-up Off: Link-down
P2	L ER ^{*1}	Red Indicates the port status of P2. On: Abnormal data received Off: Normal data received
	LINK	Green Indicates the link status of P2. On: Link-up Off: Link-down

*1 The LED is always off in offline mode.

*2 Data of cyclic transmission and transient transmission in CC-Link IE TSN are included.

3 PROCEDURES BEFORE OPERATION

This chapter describes the procedures before operation.

1. Checking the specifications of the FX5-CCLGN-MS

Check the specifications of the FX5-CCLGN-MS. (☞ Page 16 SPECIFICATIONS)

2. Mounting the FX5-CCLGN-MS

Mount the FX5-CCLGN-MS to the FX5 CPU module. For details, refer to the following.

☞ MELSEC iQ-F FX5U User's Manual (Hardware)

☞ MELSEC iQ-F FX5UC User's Manual (Hardware)

3. Wiring

Connect an Ethernet cable to the FX5-CCLGN-MS.

Wiring (☞ Page 85 WIRING)

4. Network configuration

Configure the system and set the parameters which are required for start-up.

Parameter setting (☞ Page 89 PARAMETER SETTINGS)

5. Network diagnostics

Use the network diagnostics to check that cables are connected properly and that modules are communicating correctly with the set parameters.

For details, refer to the following.

☞ Page 144 Checking the Network Status

6. Programming

Create a program. For details, refer to the following.

☞ Page 107 DEDICATED INSTRUCTION

7. Debugging

Use the CC-Link IE TSN/CC-Link IE Field diagnostics for debugging.

MEMO

3

4 FUNCTIONS

4.1 Function List

The following tables list the functions of CC-Link IE TSN.

The symbols in the availability column mean as follows:

○: Available, ×: Not available

Cyclic transmission

This function communicates data periodically among stations on the network using link devices.

Function	Description	Availability		Reference
		Master station	Local station	
Communications using RX, RY, RW _r , and RW _w	Communicates data in units of bits and words between the master station and slave stations.	○	○	Page 27 Communications using RX, RY, RW _r , and RW _w
Link refresh	Automatically transfers data between the link devices of the FX5-CCLGN-MS and the devices of the FX5 CPU module.	○	○	Page 32 Link refresh
Cyclic data assurance	Assures the cyclic data integrity in units of 32 bits or station-based units.	○	×	Page 34 Cyclic data assurance
Communication cycle coexistence	When slave stations with different communication cycles are included in the network, communicates data using multiple communication cycles according to each slave station.	○	×	Page 40 Communication cycle coexistence
I/O maintenance settings	Output mode upon CPU error	When a stop error occurs in the FX5 CPU module, set whether to hold or clear output on the sending side.	○	○
	Output hold/clear setting during CPU STOP	When the status of the FX5 CPU module changes from RUN to STOP, set whether to hold or clear output on the sending side.	○	○
	Data link faulty station setting	Set whether to clear or hold input from a disconnected station. Set it on the receiving side.	○	○

Transient transmission

This function is used for data communications at any timing and has the following three types.

Function	Description	Availability		Reference
		Master station	Local station	
Communications using a dedicated instruction	Reads/writes data from the master station or local station to devices in a CPU module of the local station using the dedicated instructions.	<input type="radio"/>	<input type="radio"/>	Page 46 Communications using a dedicated instruction
Communications using the SLMP	This type of the data communication is used to read/write data from the external device, such as a personal computer or HMI (Human Machine Interface), to devices in the CPU module of the master station and local station and the buffer memory areas of the remote station via an SLMP.	<input type="radio"/>	<input type="radio"/>	Page 47 Communications using the SLMP
Communications using the engineering tool	Sets parameters of each station or monitors each station using the engineering tool.	<input type="radio"/>	<input type="radio"/>	Page 47 Communications using the engineering tool

Ethernet connection

This function connects an Ethernet device to a module without interfering with CC-Link IE TSN.

Function	Description	Availability		Reference
		Master station	Local station	
Connection with MELSOFT products	Performs programming and monitoring of the programmable controller via Ethernet using the engineering tool.	<input type="radio"/>	<input type="radio"/>	Page 48 Connection with MELSOFT products
Connection with SLMP-compatible devices	Connects SLMP-compatible devices (such as a personal computer or a vision sensor) to the FX5-CCLGN-MS.	<input type="radio"/>	<input type="radio"/>	Page 52 Connection with SLMP-compatible devices

Security

This function ensures security according to the network environment by restricting access for each communication path to the FX5 CPU module.

Function	Description	Availability		Reference
		Master station	Local station	
IP filter	Identifies the IP address of the access source, and prevents unauthorized access.	<input type="radio"/>	<input type="radio"/>	Page 53 IP filter
Remote password	Permits or prohibits access from the external device to the FX5 CPU module via the FX5-CCLGN-MS.	<input type="radio"/>	<input type="radio"/>	Page 55 Remote password

RAS

RAS stands for Reliability, Availability, and Serviceability. This function improves overall usability of automated equipment.

Function	Description	Availability		Reference
		Master station	Local station	
Slave station disconnection	Stops data link of the station where an error occurred, and continues data link only for stations that are operating normally.	<input type="radio"/>	<input checked="" type="radio"/>	Page 60 Slave station disconnection
Automatic return	Restarts the data link automatically when the slave station that was disconnected due to an error becomes normal again.	<input type="radio"/>	<input type="radio"/>	Page 60 Automatic return
Master station duplication detection	When one network has multiple master stations, detects duplication.	<input type="radio"/>	<input checked="" type="radio"/>	Page 60 Master station duplication detection
IP address duplication detection	When one network has stations with the same IP address, detects duplication.	<input type="radio"/>	<input type="radio"/>	Page 61 IP address duplication detection
Time synchronization	Synchronizes the time of slave stations with the time synchronization source (CPU module of the master station).	<input type="radio"/>	<input type="radio"/>	Page 62 Time synchronization

Troubleshooting

This function checks the status of modules and networks by executing diagnostics and operation tests using the engineering tool.

Function	Description	Availability		Reference
		Master station	Local station	
Module communication test	Checks the module hardware when the communications using the FX5-CCLGN-MS is unstable.	<input type="radio"/>	<input type="radio"/>	Page 143 Module communication test
CC-Link IE TSN/CC-Link IE Field diagnostics	Monitors the status of CC-Link IE TSN. The network maps, stations where data link is not operating, selected station communication status monitor, and others are displayed on the engineering tool.	<input type="radio"/>	<input type="radio"/>	Page 144 CC-Link IE TSN/CC-Link IE Field diagnostics
Communication test	Checks if transient transmission data can be properly routed from the own station to the communication target.	<input type="radio"/>	<input type="radio"/>	Page 152 Communication test

Others

Function	Description	Availability		Reference
		Master station	Local station	
"CC-Link IE TSN Configuration" window	Parameter setting of a slave station	○	×	Page 100 Parameter setting of a slave station
	Detection of connected/disconnected devices	○	×	Page 102 Connected/Disconnected module detection
	Parameter processing of a slave station	○	×	Page 104 Parameter processing of a slave station
	Command execution to slave stations	○	○	Page 106 Command execution to slave stations
Reserved station setting	Reserved stations are slave stations to be included among the stations in the network for future extension and set in the parameters. These stations are not connected to actual networks, and are not regarded as faulty stations even if they are not connected. By setting a reserved station, link device assignment will not change even if the slave station is connected (or the reservation is cleared). Therefore, modification of the program is not required.	○	×	Page 100 "CC-Link IE TSN Configuration" Window
Error invalid station setting	An error invalid station is a slave station that is set to be not detected as a faulty station by the master station. It is also set when a slave station is to be replaced during data link.	○	×	Page 100 "CC-Link IE TSN Configuration" Window
Slave station parameter automatic setting	Saves parameters of the slave station to the master station, and sets the parameters automatically when the slave station is connected or returned to the network.	○	×	Page 63 Slave station parameter automatic setting
Station number/IP address setting using a program	Sets a station number and IP address to the own station which has no station number and IP address setting using a program. This function allows project data items of stations with the same program and network parameters (excluding the station numbers and IP addresses) to be the same, leading to reduced development work hours.	×	○	Page 107 Other dedicated instructions

4.2 Cyclic Transmission

This function communicates data periodically among stations on the network using link devices.

- The link devices can be assigned in "Network Configuration Settings" under "Basic Settings". (☞ Page 100 "CC-Link IE TSN Configuration" Window)
- The link refresh is assigned in "Refresh Settings" under "Basic Settings". (☞ Page 93 Refresh settings)

Cyclic transmission operates as follows with the communication mode set by the module parameter of the master station.

Communication mode	Description
Unicast mode	<ul style="list-style-type: none">• Cyclic data is sent to one station.• When this communication mode is used, the local station cannot receive cyclic data from another station. Use this mode when there is no local station or when it is not required for the local station to receive cyclic data from another station.• The cyclic transmission time of this mode is shorter than the cyclic transmission time of multicast mode. (☞ Page 215 Communication cycle intervals)
Multicast mode	<ul style="list-style-type: none">• Cyclic data is sent to multiple stations.• When this mode is used, the local station can receive cyclic data from another station. Use this mode when it is required for the local station to receive cyclic data from another station.• The cyclic transmission time of this mode is longer than the cyclic transmission time of unicast mode. (☞ Page 215 Communication cycle intervals)

Point

- When communicating in multicast mode, the local station cannot receive RX and RWr sent by the authentication Class A remote station. (☞ Page 31 At multicast mode)
- To allow the local station to obtain RX and RWr sent by the authentication Class A remote station, use the program to send RX and RWr from the master station to the local station. (☞ Page 126 Examples of Communication with Authentication Class A Remote Stations)
- When communicating in multicast mode, set "Communication Period Setting" for the local station under "Network Configuration Settings" to "Basic Period".
- If a data link error occurs in multicast mode, ERROR LED at the local station flashes. However, even if a data link error occurs at the authentication Class A remote station during data link, ERROR LED at the local station does not flash. (The LED remains off.)
- When communicating in multicast mode, 'Data link error status of each station' (SB00B0) and 'Total number of slave stations present value' (SW0059) at the local station can be checked by SB and SW. However, the information of the authentication Class A remote station may not be checked by some SB and SW.

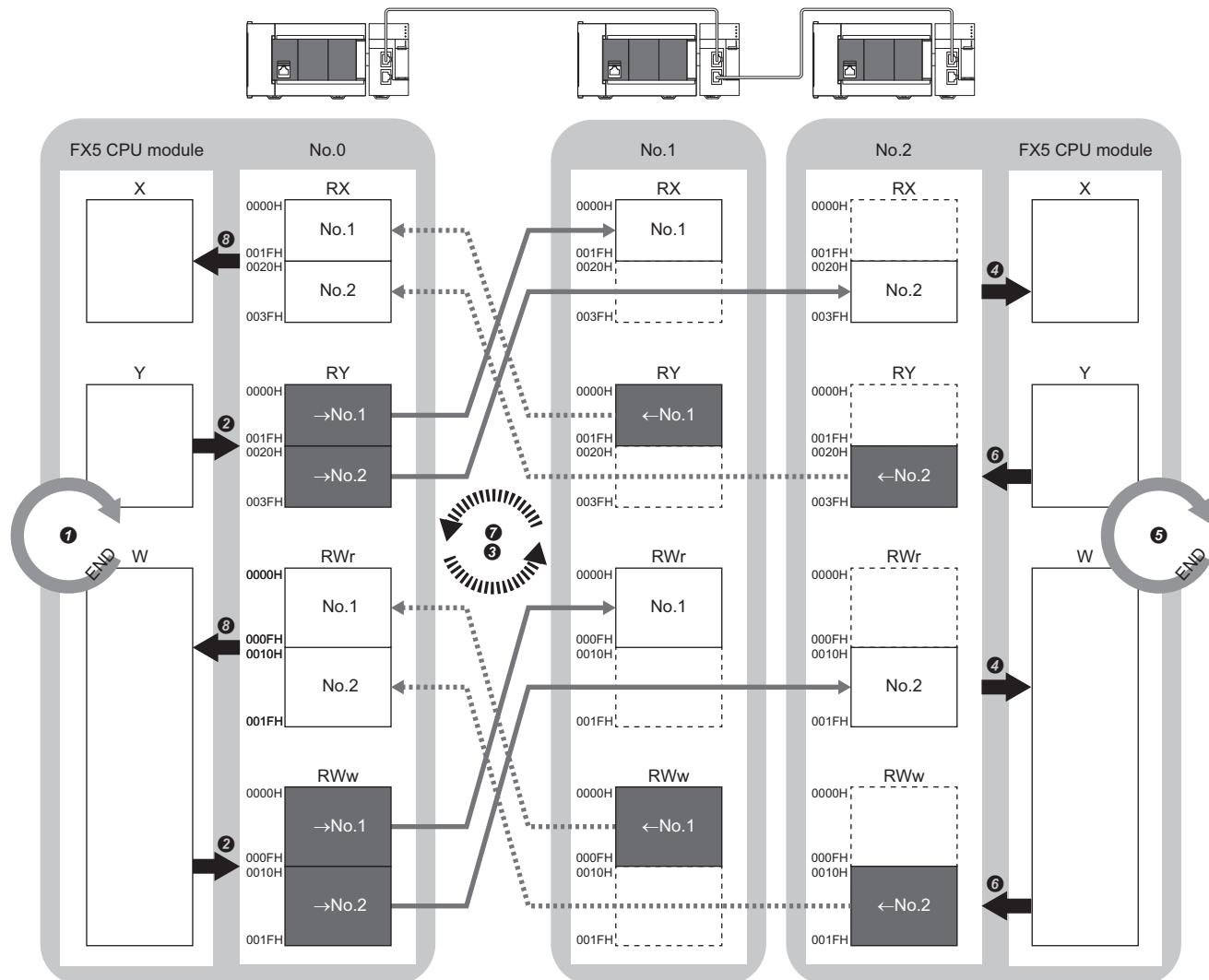
Communications using RX, RY, RWr, and RWw

This allows data communications in units of bits and in units of words between the master station and slave station.

Master station and local stations

■At unicast mode

1:1 communications between the master station and each local station. Local stations do not communicate with each other.



No.0, No.1, No.2: Station No.0 (master station), station No.1, station No.2

→No.1, →No.2: Send range: to station No.1, send range: to station No.2

←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

• Output from the master station

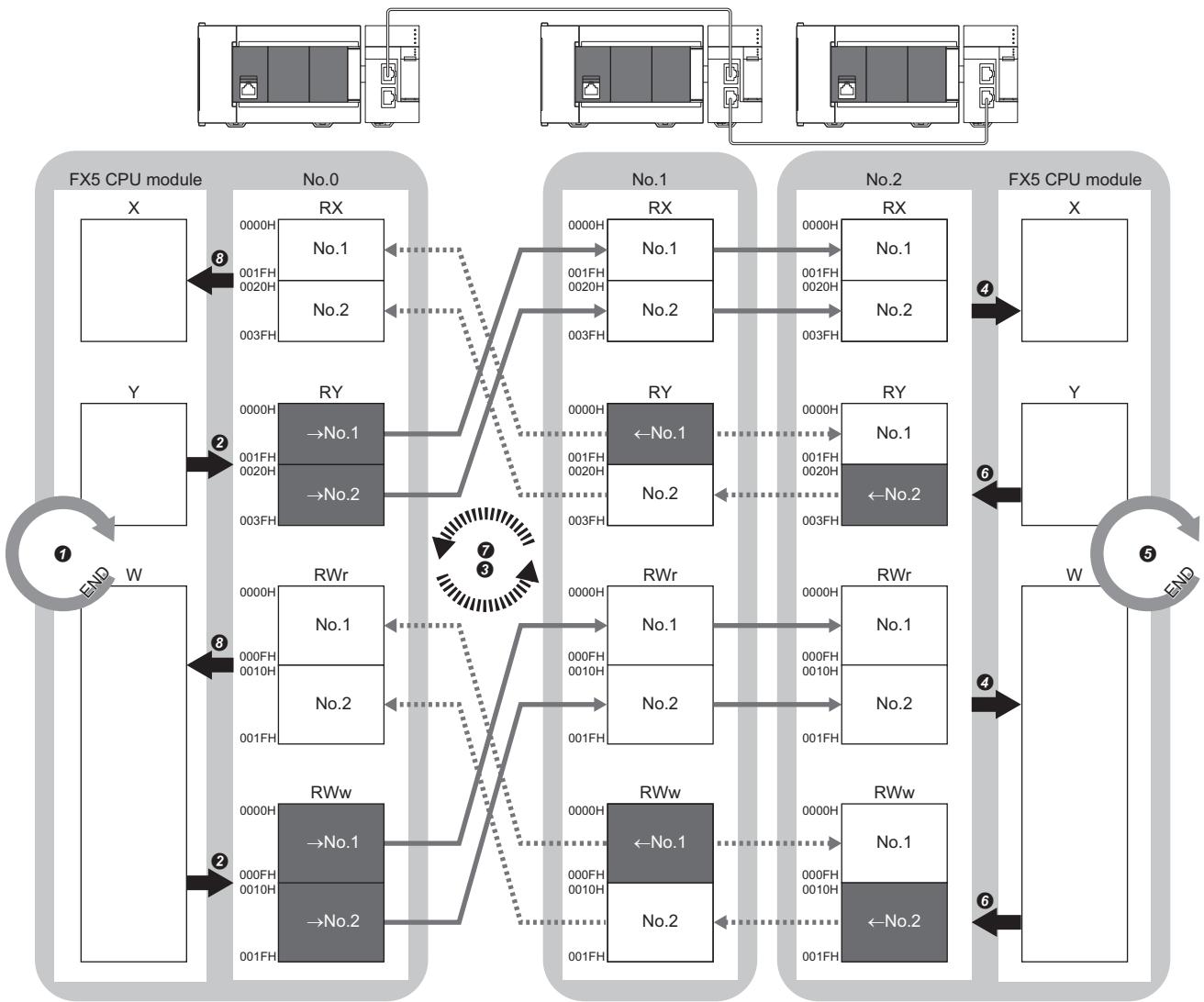
- ① The device is turned on by the sequence scan of the FX5 CPU module in the master station, and END processing is performed.
- ② The status data of the device of the FX5 CPU module is stored in the link devices (RY, RWw) of the FX5-CCLGN-MS by link refresh.
- ③ The status data of the link devices (RY, RWw) of the master station is stored in the link devices (RX, RWr) of the local station by cyclic data transfer processing.
- ④ The status data of the link devices (RX, RWr) of the local station is stored in the devices of the CPU module by link refresh.

• Input from the local station

- ⑤ The device is turned on by the sequence scan of the FX5 CPU module in the local station, and END processing is performed.
- ⑥ The status data of the device of the CPU module is stored in the link devices (RY, RWw) of the local station by link refresh.
- ⑦ The status data of the link devices (RY, RWw) of the local station is stored in the link devices (RX, RWr) of the master station by cyclic data transfer processing.
- ⑧ The status data of the link devices (RX, RWr) of the master station is stored in the devices of the CPU module by link refresh.

■At multicast mode

- The master station and local station send data on the line in multicast mode in each send range.
- The authentication Class A local station communicates data in the same communication range as the authentication Class B local station.



No.0, No.1, No.2: Station No.0 (master station), station No.1, station No.2

→No.1, →No.2: Send range: to station No.1, send range: to station No.2

←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

• Output from the master station

- ① The device is turned on by the sequence scan of the FX5 CPU module in the master station, and END processing is performed.
- ② The status data of the device of the CPU module is stored in the link devices (RY, RWr) of the master station by link refresh.
- ③ The status data of the link devices (RY, RWw) of the master station is stored in the link devices (RX, RWr) of the local station on the same network by cyclic data transfer processing.
- ④ The status data of the link devices (RX, RWr) of the local station is stored in the devices of the CPU module by link refresh.

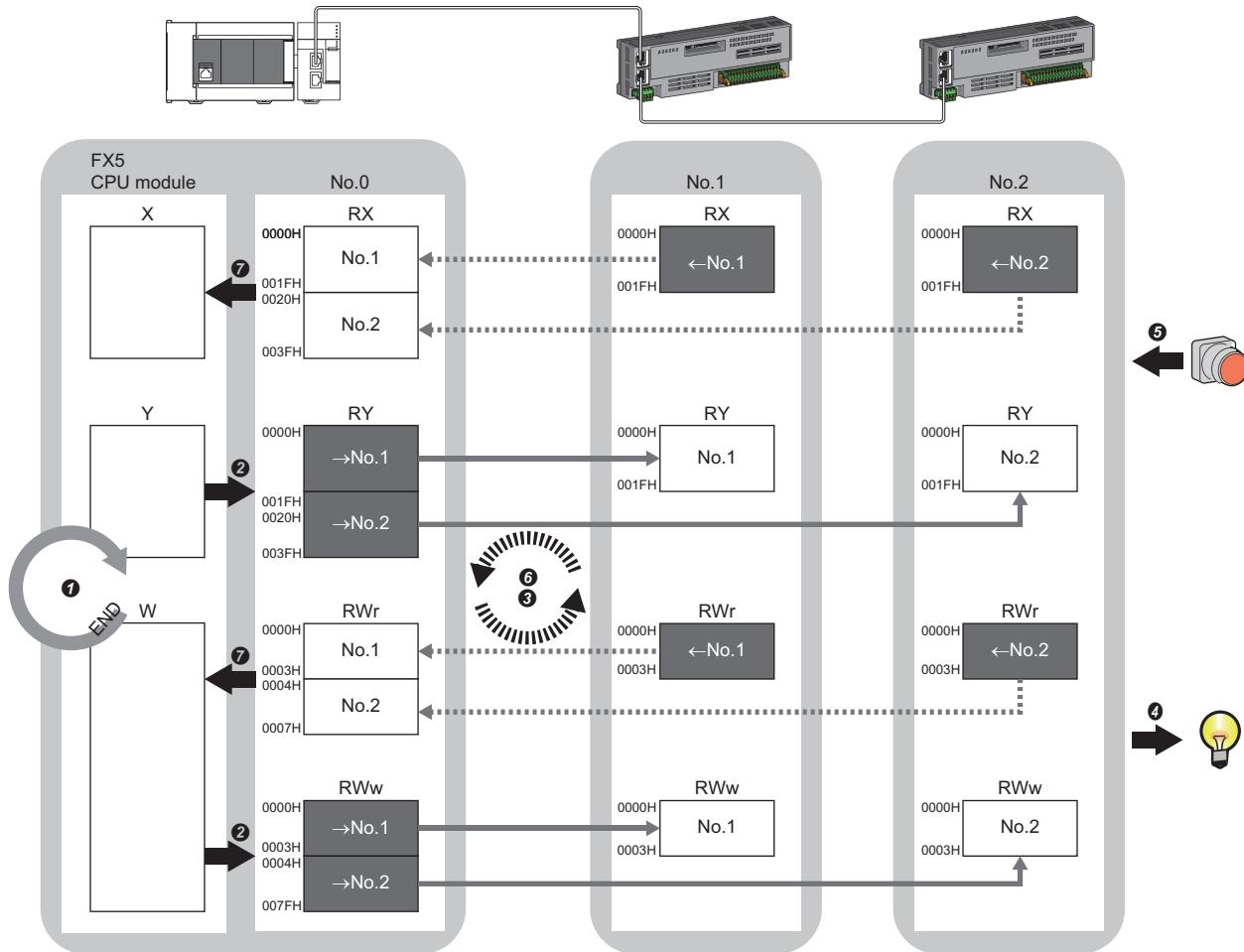
• Input from the local station

- ⑤ The device is turned on by the sequence scan of the FX5 CPU module in the local station, and END processing is performed.
- ⑥ The status data of the device of the CPU module is stored in the link devices (RY, RWw) of the local station by link refresh.
- ⑦ The status data of the link devices (RY, RWw) of the local station (station No.2) is stored in the link devices (RX, RWr) of the master station on the same network and in the link devices (RY, RWw) of the local station (station No.1) by cyclic data transfer processing.
- ⑧ The status data of the link devices (RX, RWr) of the master station is stored in the devices of the CPU module by link refresh.

Master station and remote stations

■At unicast mode

1:1 communications between the master station and each remote station. Remote stations do not communicate with each other.



4

No.0, No.1, No.2: Station No.0 (master station), station No.1, station No.2

→No.1, →No.2: Send range: to station No.1, send range: to station No.2

←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

Class A: Authentication Class A device

Class B: Authentication Class B device

• Output from the master station

- ① The device of the FX5 CPU module turns on.
- ② The status data of the device of the CPU module is stored in the link devices (RY, RWw) of the master station by link refresh.
- ③ The status data of the link devices (RY, RWw) of the master station is stored in the link devices (RY, RWw) of each remote station by cyclic data transfer processing.
- ④ The status data of the link devices (RY, RWw) of the remote station is output to the external device.

• Input from the remote station

- ⑤ The status data of the external device is stored in the link devices (RX, RWr) of the remote station.
- ⑥ The status data of the link devices (RX, RWr) of the remote station is stored in the link devices (RX, RWr) of the master station by cyclic data transfer processing.
- ⑦ The status data of the link devices (RX, RWr) of the master station is stored in the devices of the CPU module by link refresh.

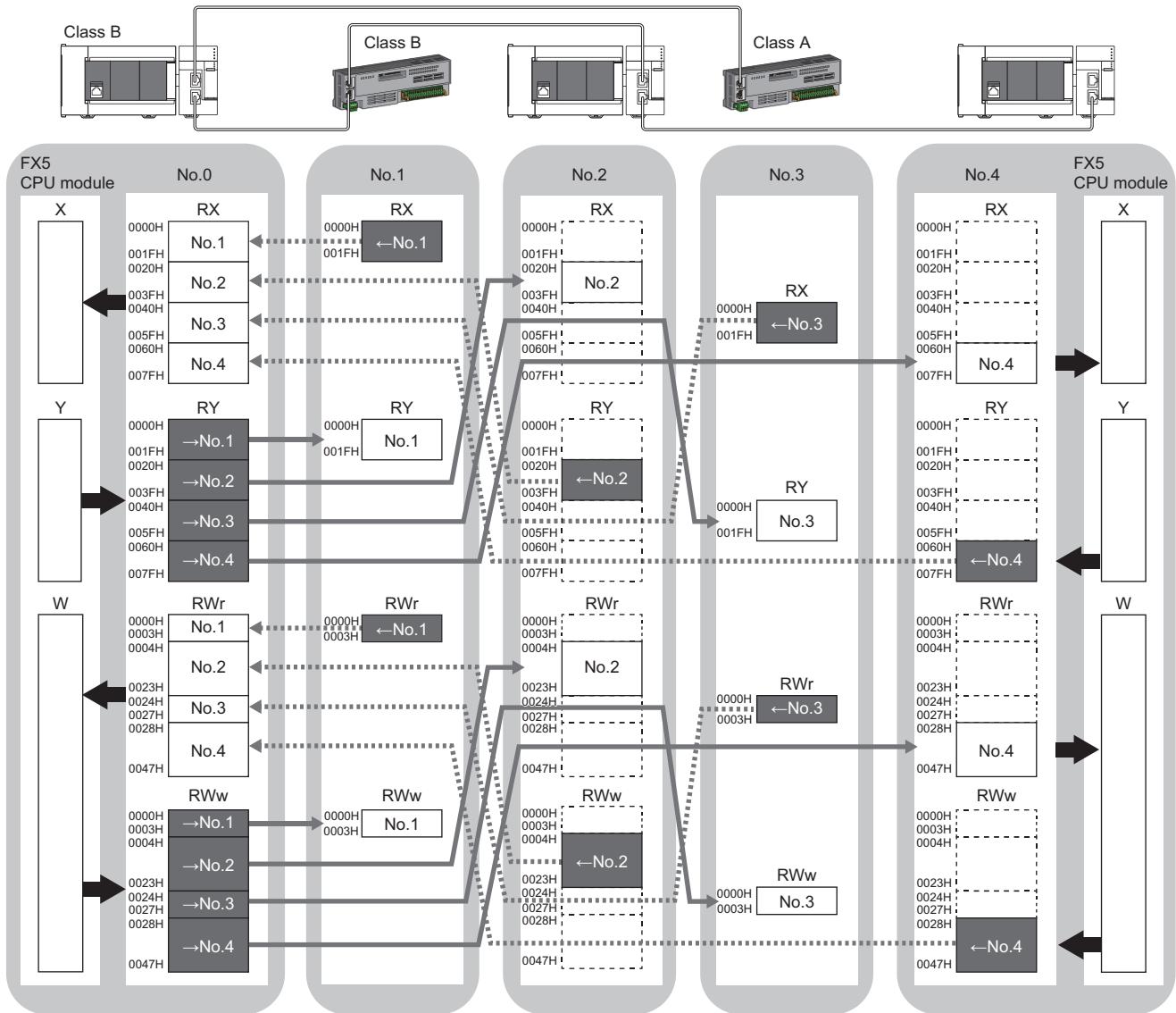
■At multicast mode

- The master station and remote station send data on the line in multicast mode in each send range.
- The master station receives all data, but the remote station discards the data of another remote station. Therefore, communications at each station are performed in the same manner as unicast mode. (☞ Page 29 At unicast mode)

Coexistence of remote stations and local stations

■At unicast mode

- 1:1 communications between the master station and each remote station, and between the master station and each local station.
- Communications are not performed between remote stations, between local stations, and between a remote station and a local station.



No.0, No.1, No.2, No.3, No.4: station No.0 (master station), station No.1, station No.2, station No.3, station No.4

→No.1, →No.2, →No.3, →No.4: Send range: to station No.1, send range: to station No.2, send range: to station No.3, send range: to station No.4

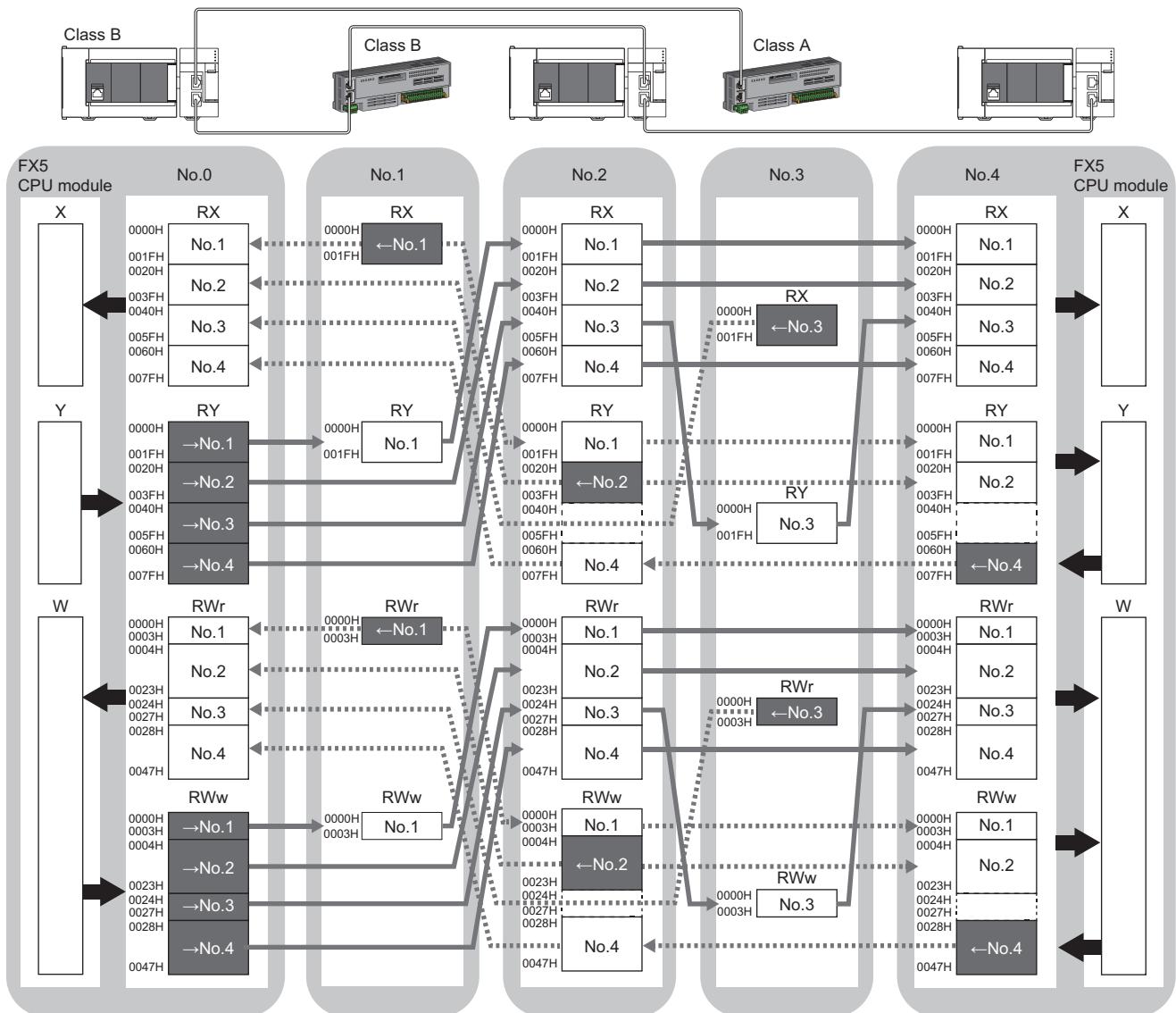
←No.1, ←No.2, ←No.3, ←No.4: Send range: from station No.1, send range: from station No.2, send range: from station No.3, send range: from station No.4

Class A: Authentication Class A device

Class B: Authentication Class B device

■At multicast mode

- The master station and each local station can obtain data of all slave stations.
- The authentication Class A local station communicates data in the same communication range as the authentication Class B local station.



No.0, No.1, No.2, No.3, No.4: station No.0 (master station), station No.1, station No.2, station No.3, station No.4

→No.1, →No.2, →No.3, →No.4: Send range: to station No.1, send range: to station No.2, send range: to station No.3, send range: to station No.4

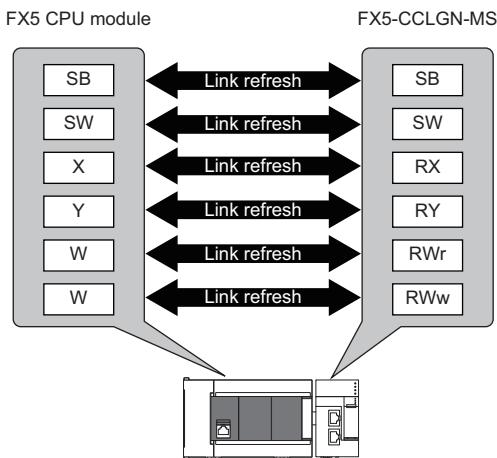
←No.1, ←No.2, ←No.3, ←No.4: Send range: from station No.1, send range: from station No.2, send range: from station No.3, send range: from station No.4

Class A: Authentication Class A device

Class B: Authentication Class B device

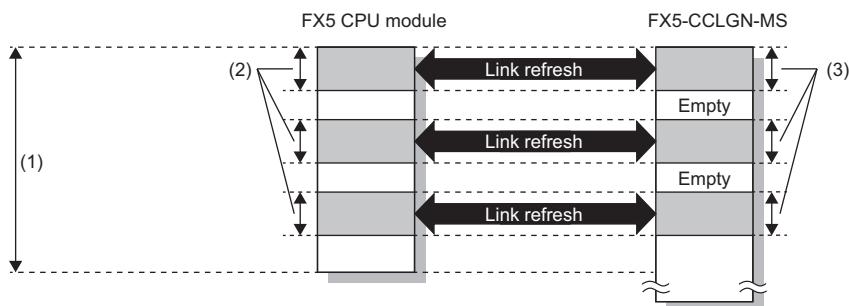
Link refresh

This function automatically transfers data between the devices of the FX5-CCLGN-MS and the devices of the FX5 CPU module.



Concept of the link refresh range (number of points)

The link refresh is performed in the range set in "Refresh Settings" under "Basic Settings" and also specified in "Network Configuration Settings".



- (1) Range set in "Refresh Settings" under "Basic Settings"
- (2) Actual link refresh range
- (3) Range set in "Network Configuration Settings" under "Basic Settings"

Shortening the transmission delay time

The transmission delay time can be shortened by reducing the number of link refresh points and shortening a communication cycle interval. (☞ Page 215 Communication cycle intervals)

To reduce the number of link refresh points, in "Refresh Settings" under "Basic Settings", set only the link devices used in the FX5 CPU module as the link refresh range. (☞ Page 93 Refresh settings)



Link refresh is performed in END processing of the sequence scan of the FX5 CPU module.

Setting method

The link refresh is assigned in "Refresh Settings" under "Basic Settings". (☞ Page 93 Refresh settings)

Precautions

■ Latched devices of the FX5 CPU module

If data in latched devices of the FX5 CPU module are cleared to zero on a program when the FX5 CPU module is powered off and on or reset, the data may be output without being cleared to zero, depending on the timing of the cyclic data transfer processing and link refresh. To prevent data in latched devices from being output, execute the following methods.

FX5 CPU module device	How to disable the device data
Latch relay (L), file register (R)	Use the device initial value of the FX5 CPU module to clear the device to zero.*1
FX5 CPU module device within the latch range	Delete all the latch range settings specified in "Latch Interval Operation Setting" under "Device Latch Interval Setting" in "Memory/Device Setting" of "CPU Parameter".

*1 For the initial device value setting of the FX5 CPU module, refer to the following.

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

Cyclic data assurance

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

○: Assured, ×: Not assured

Method	Description	Link refresh	Access to buffer memory
32-bit data assurance	Assures data in 32-bit units. Data is automatically assured by satisfying assignment conditions of link devices.	○	○
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.	○	×
Interlock program	Assures data of more than 32 bits. Data is assured by configuring interlocks on programs.	○	○

Point

When a remote station is in the network, use station-based block data assurance. If it is disabled, the functions of the remote station cannot be assured.

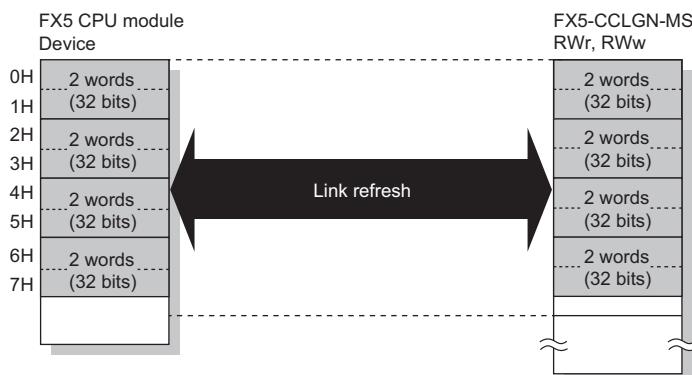
32-bit data assurance

Assures RWr and RWw data in 32-bit units.

■Data assurance at the time of access to link devices

When link refresh target devices are accessed, the integrity of 32-bit data can be assured by satisfying the following conditions:

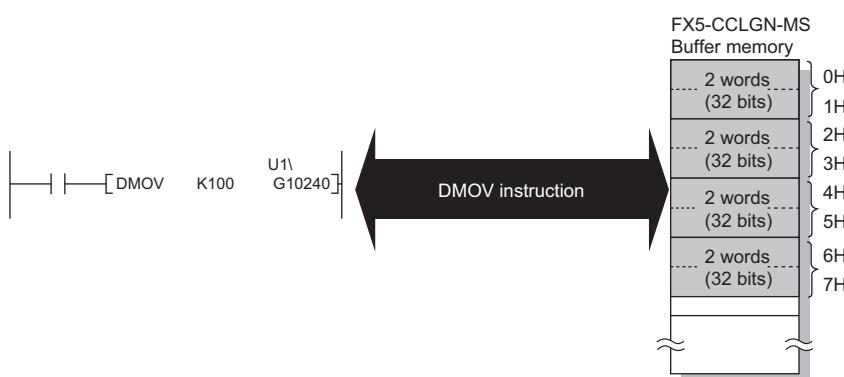
- The start device number of RWr and RWw is a multiple of 2
- The number of points assigned to RWr and RWw is a multiple of 2.



■Data assurance at the time of access to buffer memory

The integrity of 32-bit data can be assured by satisfying the following conditions:

- Access using the DMOV instruction
- The start address of the buffer memory is a multiple of 2.



Station-based block data assurance

Integrity of the cyclic data is assured for each station by handshake between the FX5 CPU module and the FX5-CCLGN-MS for a link refresh.

■Setting

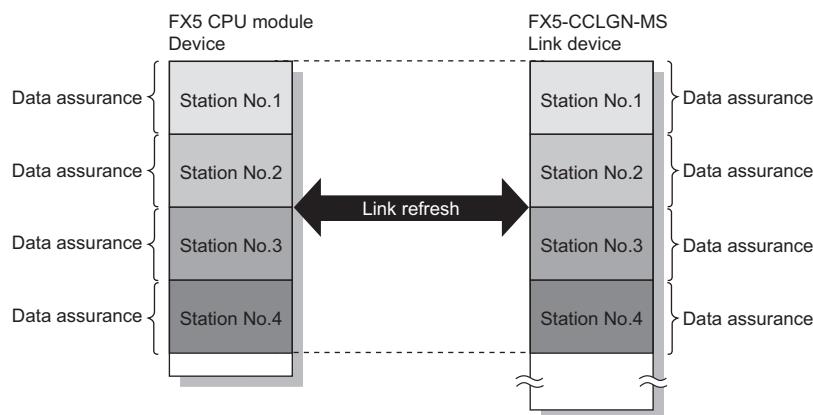
Set station-based block data assurance under "Supplementary Cyclic Settings" in "Application Settings" of the master station.
( Page 97 Application Settings)

Once this setting is enabled on the master 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.

4



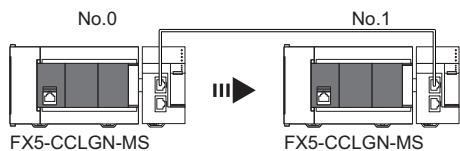
Interlock program

Data of more than 32 bits can be assured without using the station-based block data assurance setting. Use either of the following methods for interlocking:

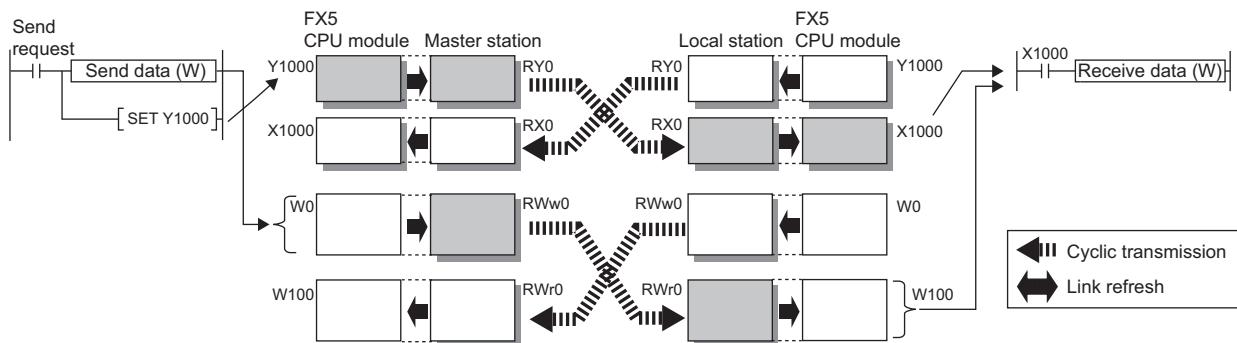
- Data assurance by handshake of the remote I/O
- Data assurance by handshake of the remote register

■Data assurance by handshake of the remote I/O

The following shows an example of sending data in W0 to W3 of the master station (station No.0) to W100 to W103 of the local station (station No.1). (X1000 and Y1000 are used for a handshake to the FX5 CPU module.)



- Data flow



- Program

Sending station: Master station (station No.0)

Classification	Setting details															
Label to be defined	<p>Define global labels as shown below:</p> <table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>M0</td> </tr> <tr> <td>2</td> <td>uTransferFrom</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>D0</td> </tr> </tbody> </table>		Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection	Bit	... VAR_GLOBAL	M0	2	uTransferFrom	Word [Signed]	... VAR_GLOBAL	D0
	Label Name	Data Type	Class	Assign (Device/Label)												
1	bStartDirection	Bit	... VAR_GLOBAL	M0												
2	uTransferFrom	Word [Signed]	... VAR_GLOBAL	D0												



4

Receiving station: Local station (station No.1)

Classification	Setting details										
Label to be defined	<p>Define global labels as shown below:</p> <table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>uTransferTo</td> <td>Word [Signed]</td> <td>VAR_GLOBAL</td> <td>D0</td> </tr> </tbody> </table>		Label Name	Data Type	Class	Assign (Device/Label)	1	uTransferTo	Word [Signed]	VAR_GLOBAL	D0
	Label Name	Data Type	Class	Assign (Device/Label)							
1	uTransferTo	Word [Signed]	VAR_GLOBAL	D0							



- Program flow

- ① The master station checks that the send request bStartDirection (M0) is turned on, and transfers contents of uTransferFrom [0] to [3] (D0 to D3) to the send data W0 to W3.
- ② When the transfer is completed, the master station turns on Y1000.
- ③ The local station checks that X1000 is turned on, and transfers contents of the receive data W100 to W103 to uTransferTo [0] to [3] (D0 to D3).
- ④ When the transfer is completed, the local station turns on Y1000.
- ⑤ The master station checks that X1000 is turned on, and turns off Y1000.
- ⑥ The local station checks that X1000 is turned off, and turns off the reception complete signal Y1000.

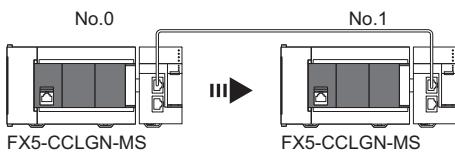
Precautions

When performing handshake of the remote I/O (RX, RY), set a device to be used as a handshake flag after a remote register that prevents data inconsistency in the "Refresh Settings". Otherwise, the data inconsistency may occur even when the program above is used.

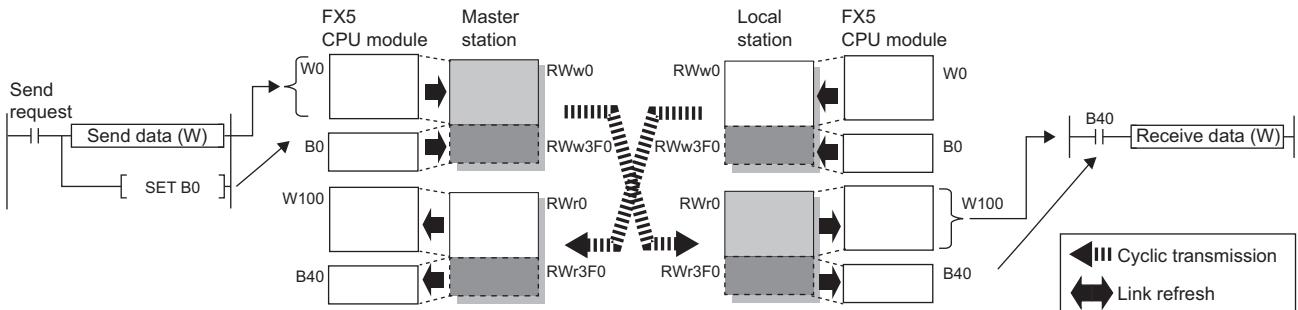
◀ Page 93 Refresh settings

■Data assurance by handshake of the remote register

The following shows an example of sending data in W0 to W3 of the master station (station No.0) to W100 to W103 of the local station (station No.1). (B0 and B40 are used for a handshake to the FX5 CPU module.)



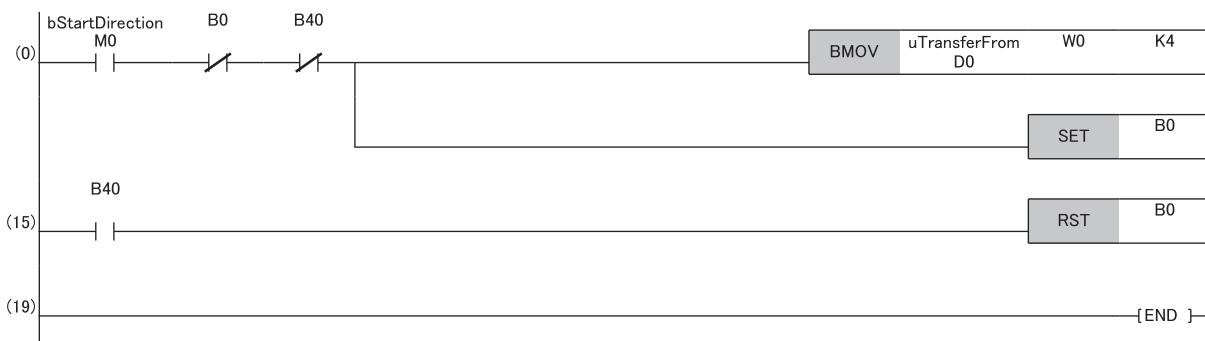
- Data flow



- Program

Sending station: Master station (station No.0)

Classification	Setting details															
Label to be defined	<p>Define global labels as shown below:</p> <table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>M0</td> </tr> <tr> <td>2</td> <td>uTransferFrom</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>D0</td> </tr> </tbody> </table>		Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection	Bit	... VAR_GLOBAL	M0	2	uTransferFrom	Word [Signed]	... VAR_GLOBAL	D0
	Label Name	Data Type	Class	Assign (Device/Label)												
1	bStartDirection	Bit	... VAR_GLOBAL	M0												
2	uTransferFrom	Word [Signed]	... VAR_GLOBAL	D0												



Receiving station: Local station (station No.1)

Classification	Setting details
Label to be defined	Define global labels as shown below:



- Program flow

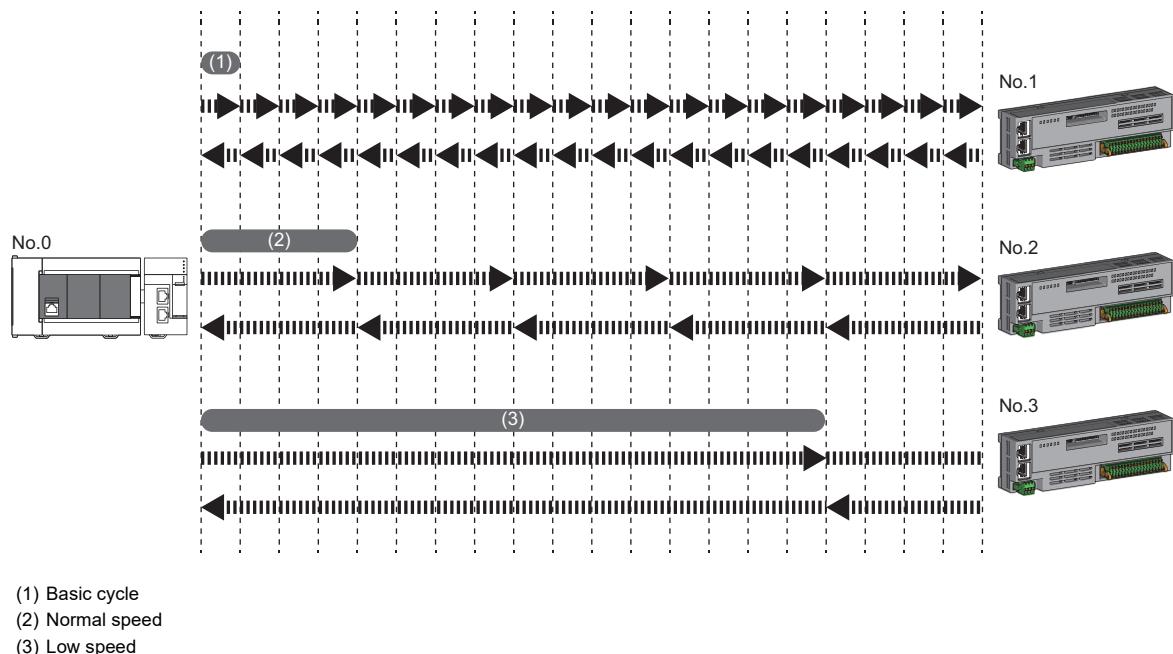
- ➊ The master station checks that the send request bStartDirection (M0) is turned on, and transfers contents of uTransferFrom [0] to [3] to the send data W0 to W3.
- ➋ When the transfer is completed, the master station turns on B0.
- ➌ The local station checks that B40 is turned on, and transfers contents of the receive data W100 to W103 to uTransferTo [0] to [3] (D0 to D3).
- ➍ When the transfer is completed, the local station turns on B0.
- ➎ The master station checks that B40 is turned on, and turns off B0.
- ➏ The local station checks that B40 is turned off, and turns off B0.

Communication cycle coexistence

When slave stations with different communication cycles are included in the network, communicates data using multiple communication cycles according to each slave station.

The time for each communication cycle is the total time of cyclic transmission, transient transmission, and system reservation time.

Even if slave stations with different communication cycles are connected to a network, a slave station with a high-speed communication cycle is not affected by a slave station with a low speed.



Setting method

The master station communicates with slave stations by using three communication cycles that are the basic cycle under "Basic Period Setting", and "Normal-Speed" and "Low-Speed" under "Multiple Period Setting". ([Page 95 Communication period setting](#))

The communication cycle of each slave station can be selected from "Basic Period", "Normal-Speed", or "Low-Speed" in "Network Configuration Settings" under "Basic Settings".

Precautions

When "Communication Mode" under "Application Settings" is set to "Multicast", set "Communication Period Setting" for the local station in "Network Configuration Settings" to "Basic Period".

I/O maintenance settings

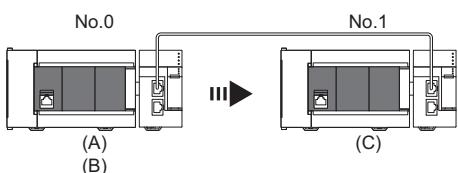
When using cyclic transmission, set whether to hold or clear output on the sending side or input on the receiving side by using the following settings of (A), (B), and (C). (☞ Page 98 Supplementary cyclic settings)

- Setting on sending side (A): "Output Mode upon CPU Error" when a stop error occurred in the FX5 CPU module on the sending side
- Setting on sending side (B): "Output Hold/Clear Setting during CPU STOP" when the status of the FX5 CPU module on the sending side changed from RUN to STOP
- Setting on receiving side (C): "Data Link Faulty Station Setting" when the sending side is disconnected

☞ [Application Settings] ⇒ [Supplementary Cyclic Settings] ⇒ [I/O Maintenance Settings]

Input data hold/clear operation on the receiving side

4



■ If an FX5 CPU module stop error occurred on the sending side

- If both settings (A) and (B) on the sending side are "Hold", input data on the receiving side is held.
- If setting (A) or (B) on the sending side is "Clear", input data on the receiving side is cleared. (The sending side sends the data cleared to 0.)

■ If the FX5 CPU module on the sending side changed from RUN to STOP

- If setting (B) on the sending side is "Hold", input data on the receiving side is held.
- If setting (B) on the sending side is "Clear", input data on the receiving side is cleared. (The sending side sends the data cleared to 0.)

■ If the sending side disconnected

- If setting (C) on the receiving side is "Hold", input data before disconnection is held on the receiving side.
- If setting (C) on the receiving side is "Clear", input data on the receiving side is cleared.

Precautions

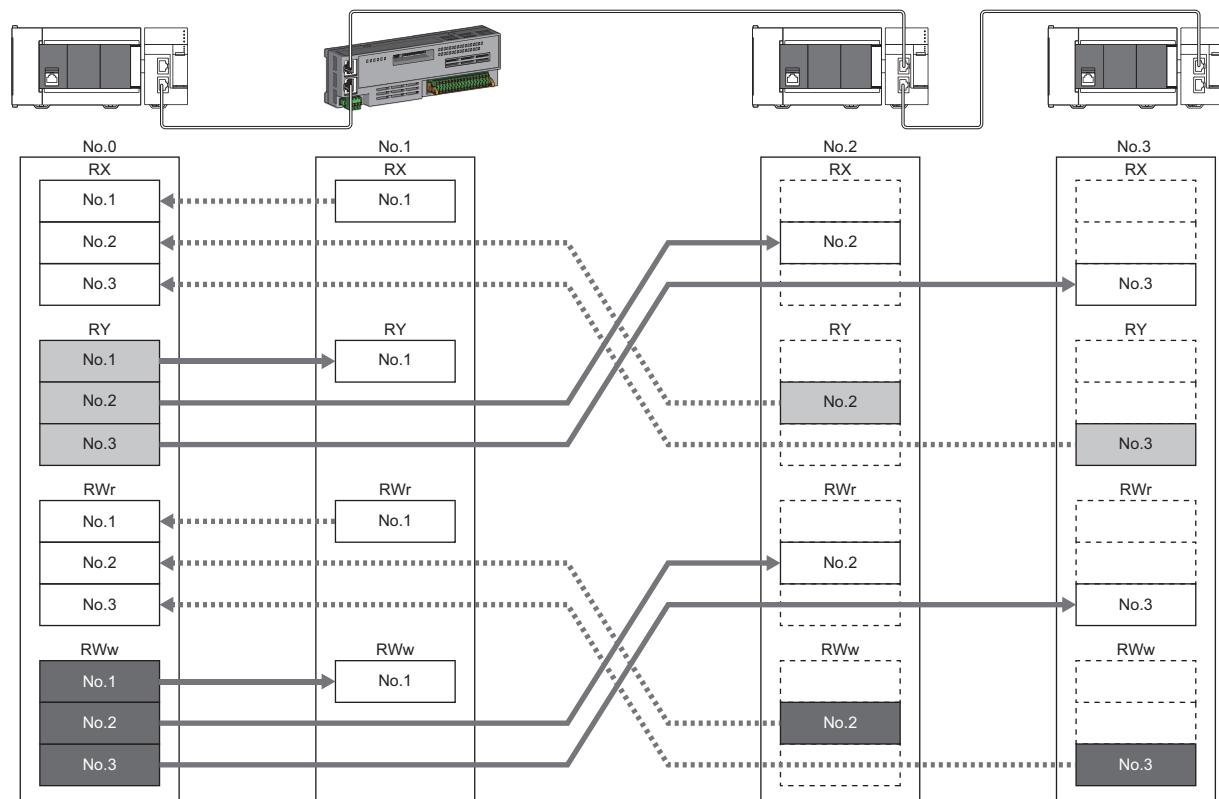
■ When "Output Hold/Clear Setting during CPU STOP" is set to "Clear"

When the FX5 CPU module is in the STOP state, the forced output to slave stations cannot be executed using the engineering tool.

Output data hold/clear operation during CPU STOP

The following figure shows the devices where the setting of "Output Hold/Clear Setting during CPU STOP" is enabled when the FX5 CPU module on the sending side changes from RUN to STOP.

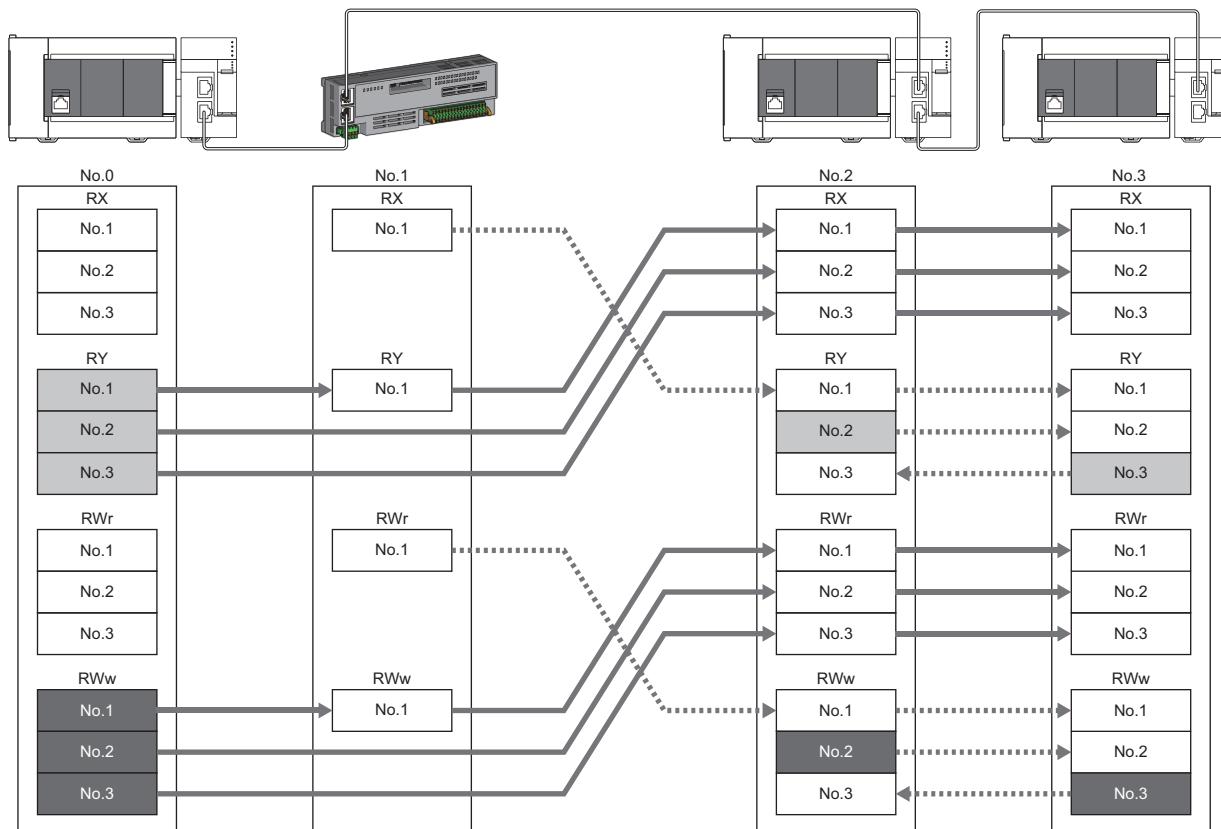
■At unicast mode



■ : When the link refresh source is set to a source other than Y, data is held or cleared according to the parameter setting. When the link refresh source is set to Y, data is cleared regardless of the parameter setting.

■ : Data is held regardless of the parameter setting.

■At multicast mode



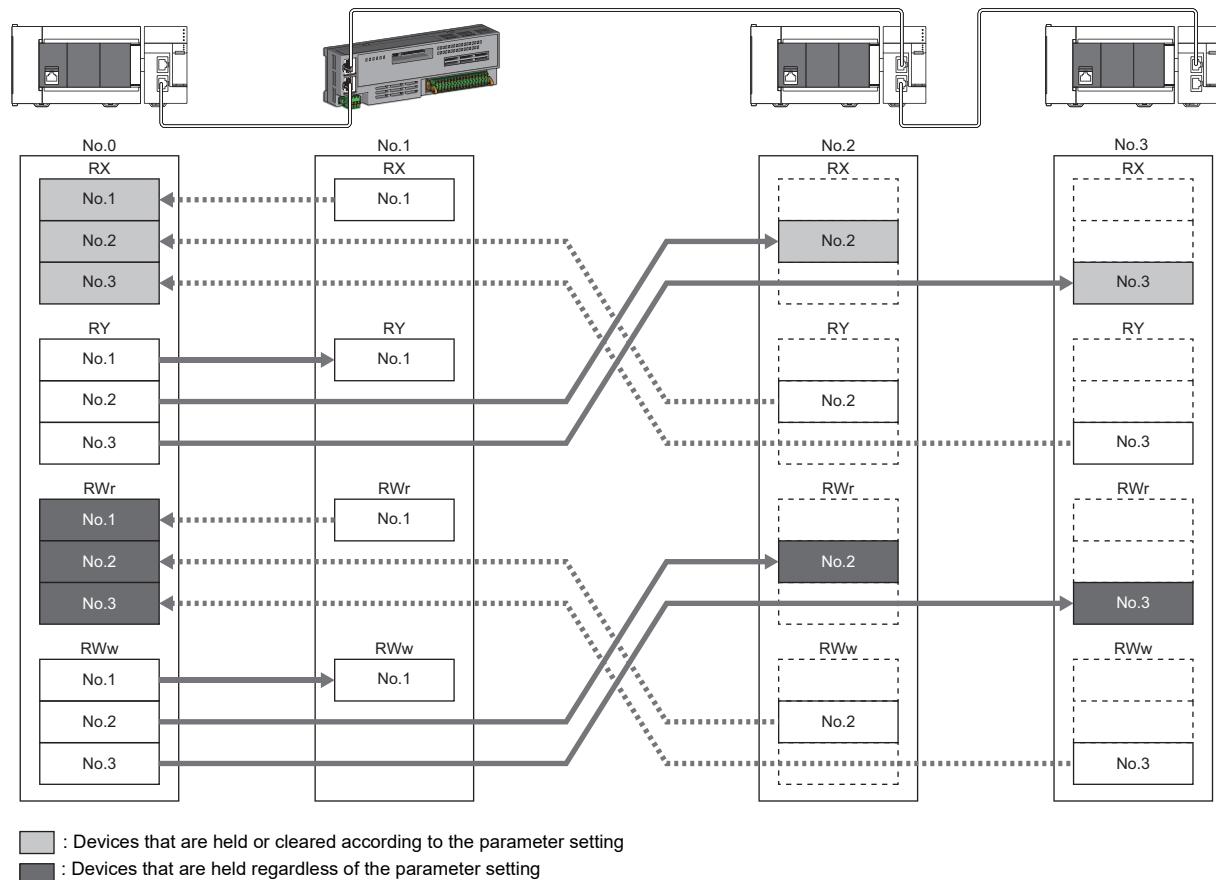
■ : When the link refresh source is set to a source other than Y, data is held or cleared according to the parameter setting. When the link refresh source is set to Y, data is cleared regardless of the parameter setting.

■ : Data is held regardless of the parameter setting.

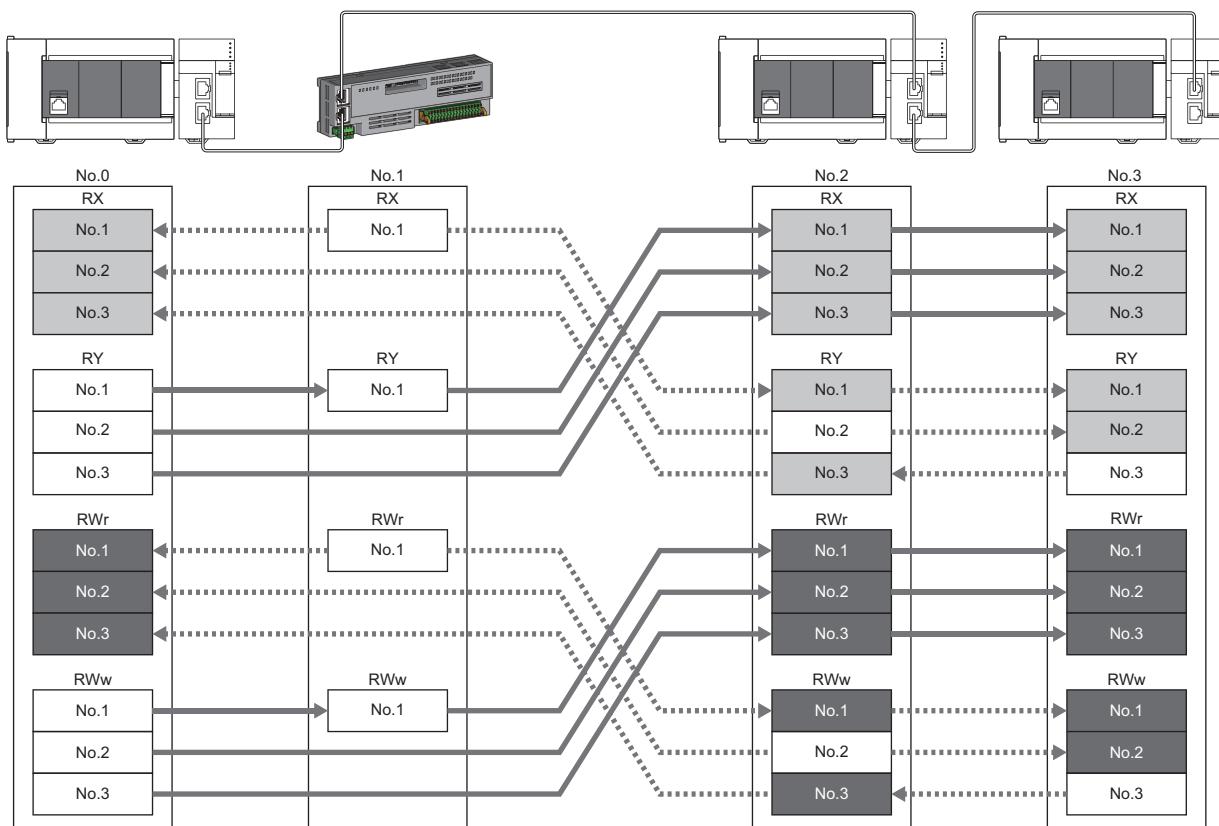
Input data hold/clear operation from the data link faulty station

The following figure shows the devices where "Data Link Faulty Station Setting" is enabled when each station becomes faulty.

■At unicast mode



■At multicast mode



■At multicast mode

4.3 Transient Transmission

This function is used for data communications at any timing and has the following three types.

☞ Page 46 Communications using a dedicated instruction

☞ Page 47 Communications using the SLMP

☞ Page 47 Communications using the engineering tool

FX5-CCLGN-MS can communicate only in the same network.

Communications using a dedicated instruction

This type of the data communication is used to read/write data from the master station or local station to devices in a CPU module of the local station using the dedicated instructions.

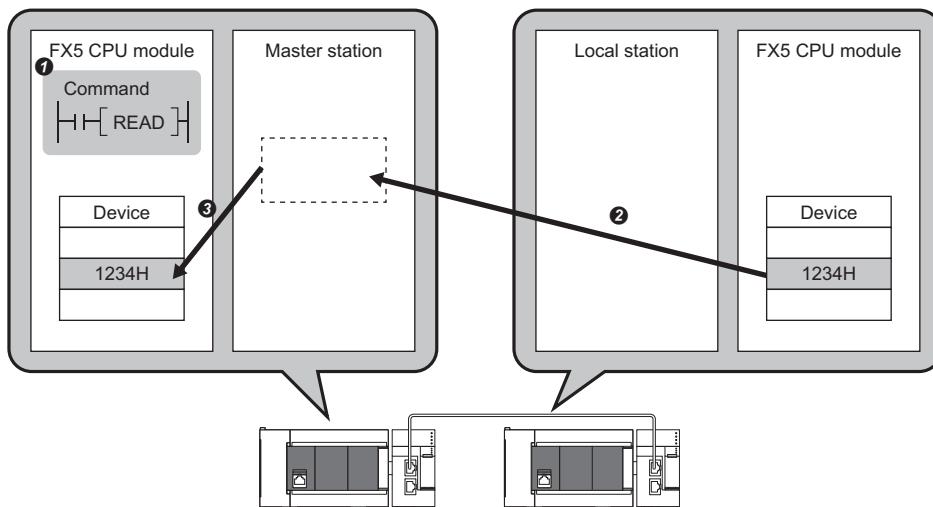
For dedicated instructions that can be used and details on dedicated instructions, refer to the following.

☞ Page 107 DEDICATED INSTRUCTION

☞ MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks)

Ex.

Accessing a local station using the dedicated instruction (READ instruction)

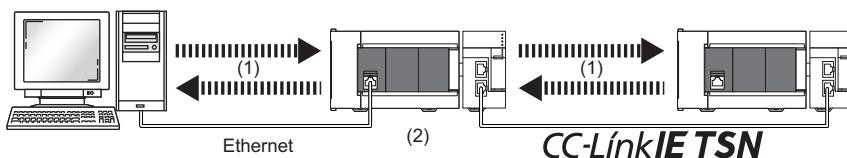


Communications using the SLMP

This type of the data communication is used to read/write data from the external device, such as a personal computer or HMI (Human Machine Interface), to devices in the CPU module of the master station and local station and the buffer memory areas of the remote station via an SLMP.

The FX5-CCLGN-MS operates as SLMP server, and sends and receives (1) and relays (2) SLMP messages. For details on SLMP, refer to the following.

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



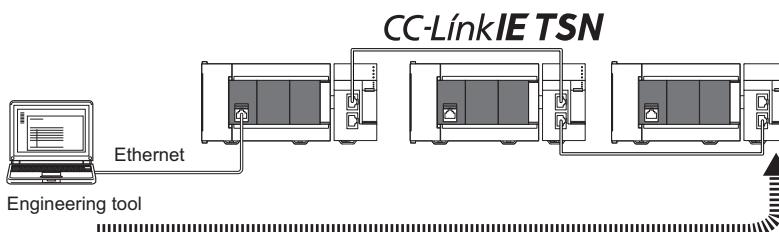
4

Precautions

For SLMP communications, set the same communication speed for the connected station and access destination. If the communication speed differs between the connected station and access destination, SLMP communications may not be performed.

Communications using the engineering tool

This type of the data communication is used to perform the settings of or monitor each station using the engineering tool.



4.4 Ethernet Connection

This function connects an Ethernet device to a module without interfering with CC-Link IE TSN.

Connection with MELSOFT products

Programming and monitoring of the programmable controller are performed via Ethernet using the engineering tool. This function enables remote control using long-distance connectivity and high-speed communications via Ethernet.

The following table lists the methods of connecting the FX5-CCLGN-MS to MELSOFT products (such as engineering tool).

○: Connection available, ×: Connection not available

Connection method	Purpose	Availability	Reference
		MELSOFT product	
Connection via a HUB (Connection by specifying the IP address)	To connect multiple MELSOFT products	○	Page 48 Connection via a HUB
Connection via a HUB (Connection by specifying the network number and station number)	To connect multiple MELSOFT products	○	

Restriction

A station with a communication speed different from the communication speed of the station to which the engineering tool is connected cannot be connected by specifying another station. The online and debug function of the engineering tool may not be used.

Connection via a HUB

■Settings on the FX5-CCLGN-MS side

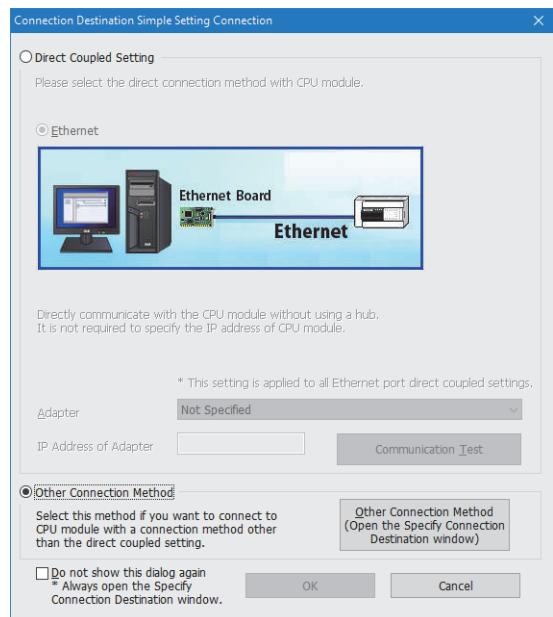
- For connection by specifying the IP address, set the IP address using "Required Settings". (☞ Page 91 Station No./IP address setting)
- For connection by specifying the network number and station number, set the network number and station number in "Required Settings".

Neither of connections require "Network Configuration Settings" under "Basic Settings".

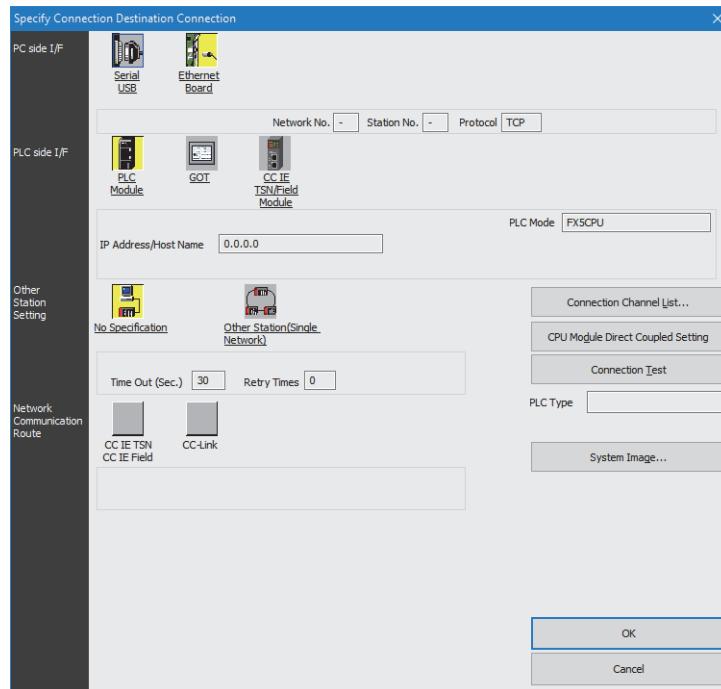
■Settings on the engineering tool side

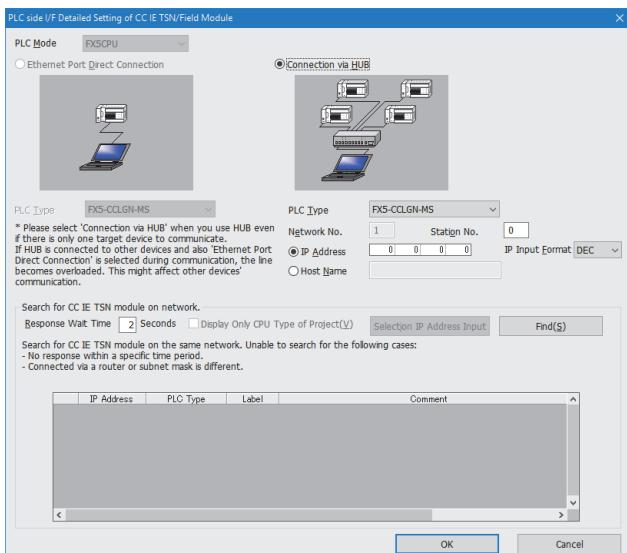
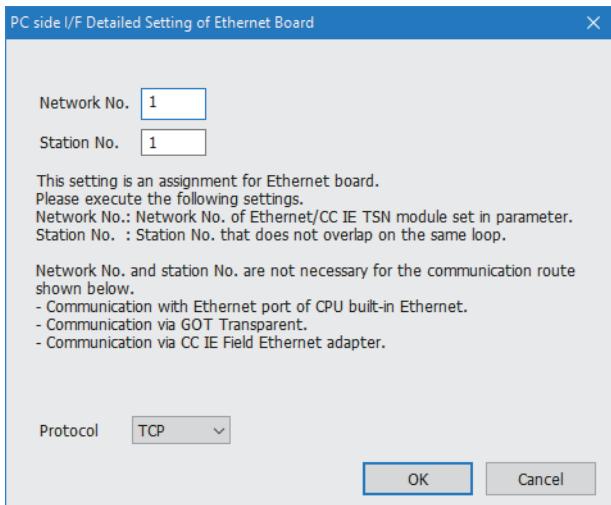
Set in the "Specify Connection Destination Connection" window.

🔗 [Online] ⇒ [Current Connection Destination]



🔗 [Other Connection Method] ⇒ [Other Connection Method (Open the Specify Connection Destination window)]





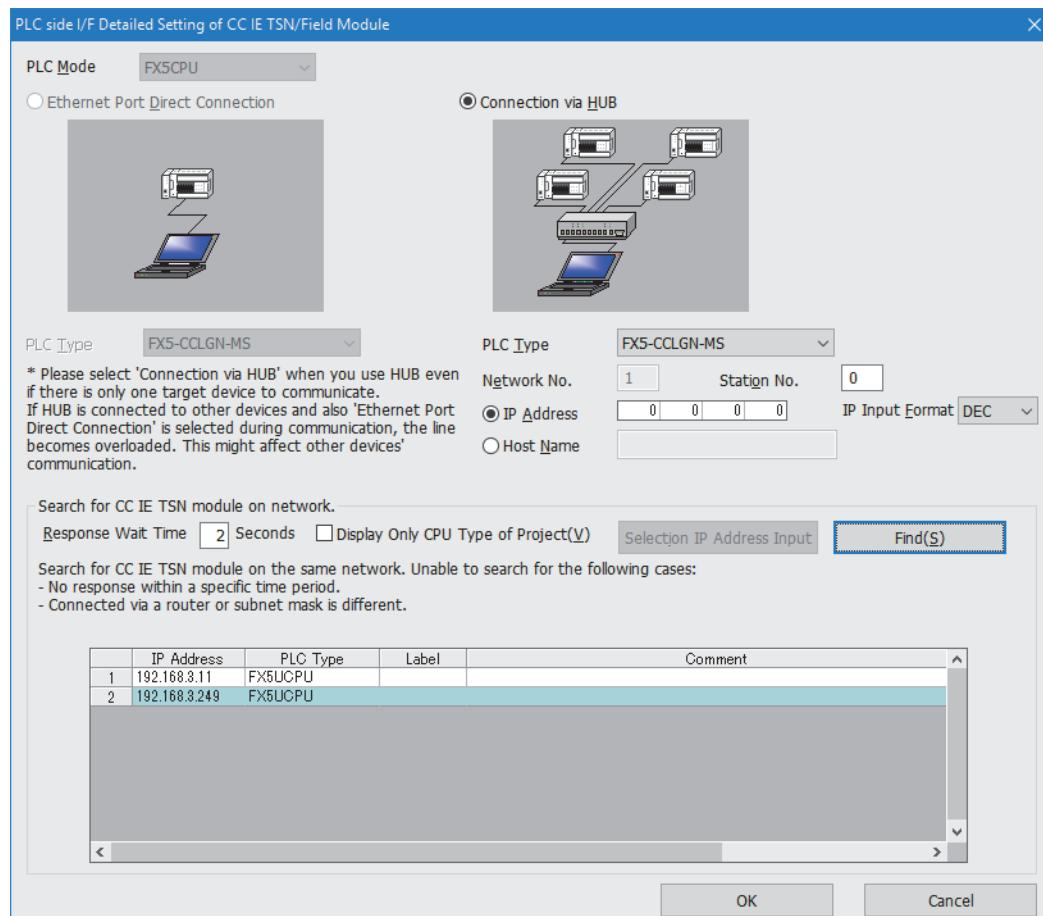
1. Set "PC side I/F" to "Ethernet Board".
2. Double-click "Ethernet Board", and open the "PC side I/F Detailed Setting of Ethernet Board" window.
3. Set the network number, station number, and protocol of the personal computer.

TCP: A connection is established during communication. Since data is exchanged while checking that the data has correctly reached the communication destination, the data reliability can be ensured. Note that the line load is larger than UDP/IP communications.

UDP: Since a connection is not established during communication and whether the communication destination has correctly received the data is not checked, the line load is lower. Note that the data reliability is lower than TCP/IP communications.
4. Set the "PLC side I/F" to the module to be connected.
5. Double-click the icon set in step 4, and open the detailed setting window.
6. Select "Connection via a HUB" for the connection method, and enter the station number and IP address or host name of the FX5-CCLGN-MS.
7. Specify "Other Station Setting" or "Network Communication Route" if necessary.

■Searching modules on the network

For a connection using a switching hub, a list of modules that can be searched for will appear by clicking the [Find] button on the detailed setting window.



Search target modules are as follows.

- FX5 CPU module connected to the same switching hub as the engineering tool
- FX5 CPU module connected to cascade-connected switching hub

If the connected FX5-CCLGN-MS does not appear in the list after searching for the modules on the network, check the following items.

- Search cannot be performed if it is disabled with the IP filter.
- Modules connected via a router cannot be searched for.
- If modules with the same IP address are listed, correct the setting of the IP address in "Network Configuration Settings" under "Basic Settings" of the master station.
- If the service processing load of the search-target FX5 CPU module is high, a search for the corresponding module may not be performed. If the search cannot be performed, increase the response waiting time in the search dialog, and execute the search again.

Connection with SLMP-compatible devices

SLMP-compatible devices (such as a personal computer or a vision sensor) are connected to the FX5-CCLGN-MS.

For details on SLMP, refer to the following.

 SLMP Reference Manual

Restriction

- To execute communications using SLMP, set the same communication speed for the connected station and access destination. If the communication speed differs between the connected station and access destination, when communications using SLMP are executed, the communications may not be performed.
- When the system structure is mixed with an Ethernet device, there are restrictions for the network topology and connection destination of the Ethernet device. ( Page 64 SYSTEM CONFIGURATION)

4.5 Security

This function ensures security according to the network environment by restricting access for each communication path to the FX5 CPU module. The following two access restriction methods can be used.

☞ Page 53 IP filter

☞ Page 55 Remote password

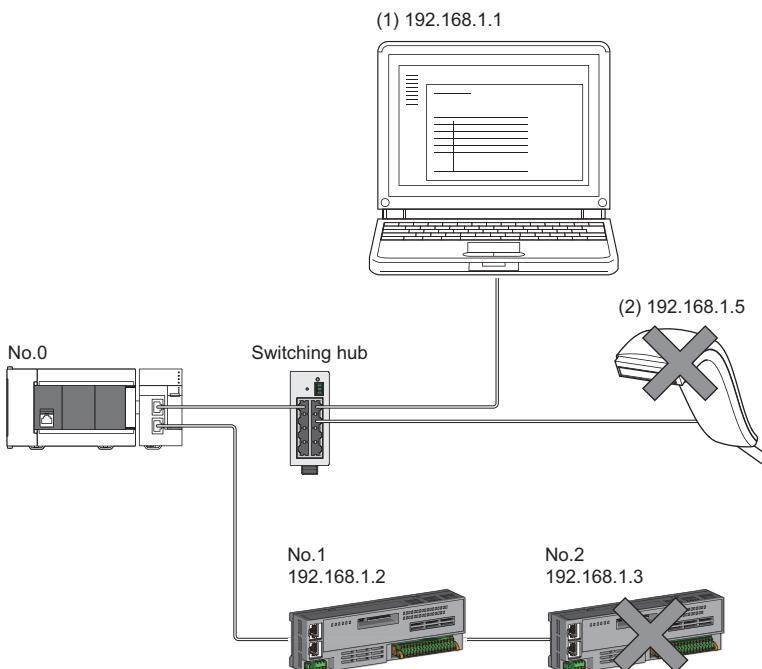
IP filter

This function identifies the IP address of the access source, and prevents unauthorized access.

By setting the IP address of the access source using the engineering tool, IP packets are allowed or blocked. (The IP packets received from the access source are allowed or blocked. IP packets sent from the own station are ignored.)

Use of this function is recommended when using in an environment connected to a LAN line.

4



When the "Allow" IP addresses are set to 192.168.1.1 and 192.168.1.2 using the IP filter of the master station No.0:

Only the Ethernet device (1) and slave station No.1 can access the master station, and the Ethernet device (2) and slave station No.2 cannot access the master station.

Point

The IP filter is one method of preventing unauthorized access (such as a program or data destruction) from an external device. It does not completely prevent unauthorized access. Take appropriate measures other than this function if the safety of the programmable controller system must be maintained against unauthorized access from an external device. Mitsubishi shall not be held liable for any system problems that may occur from unauthorized access.

Examples of measures for unauthorized access are as follows.

- Install a firewall.
- Install a personal computer as a relay station, and control the relay of send/receive data with an application program.
- Install an external device for which the access rights can be controlled as a relay station. (Contact the network service provider or equipment dealer for details on the external devices for which access rights can be controlled.)

Setting method

1. Set the IP address to be allowed or blocked in the "IP Filter Settings" window of "Security" under "Application Settings".

( Page 99 Security)

A warning is displayed in the following cases.

- When blocking the IP address of the slave station set in "Network Configuration Settings" under "Basic Settings" was attempted
- When a slave station is not set in "Network Configuration Settings" under "Basic Settings", and the "Allow" target IP address is not set in the "IP Filter Settings" window (because the IP filter blocks every IP address)

2. Write the module parameters to the FX5 CPU module.

3. The IP filter is enabled when the FX5 CPU module is powered off and on or reset.

Point

Even if the connection was specified in "Network Configuration Settings" under "Basic Settings" or by a program, access from the external device is either allowed or blocked according to the setting in the "IP Filter Settings" window.

Setting target

Allow or block should be set to all IP addresses that connect to the same network. Also, set allow or block to the IP address of the slave station that is registered in "Network Configuration Settings" under "Basic Settings".

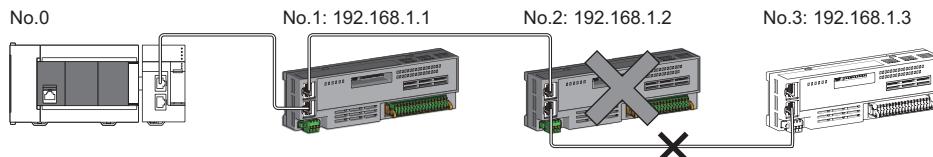
Register the setting details to the master station, and allow or block the IP packets received from the slave station with the registered IP address.

Operation

Even for the slave station registered in "Network Configuration Settings" under "Basic Settings", a station with an IP address set as blocked can become a disconnected station. As a result, cyclic transmission and transient transmission are not performed. Such a station is also displayed as a disconnected station on the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window. However, Ethernet devices are not displayed on the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window. ( Page 144 CC-Link IE TSN/CC-Link IE Field diagnostics)

Precautions

- Do not set the IP address of the master station or of a slave station as blocked. When a slave station using line topology is set as blocked, cyclic and transient transmissions cannot be performed on the slave stations that are connected after the slave station set as blocked.



When the "Deny" IP address is set to 192.168.1.2 using the IP filter of the master station No.0:

Only the slave station No.1 can access the master station, and the slave stations No.2 and No.3 cannot access the master station.

- If there is a proxy server in the LAN line, block the IP address of the proxy server. If the IP address is allowed, access from personal computers that access the proxy server will not be prevented.
- To block access from an external device to another station, block access to the connected station (station connected directly to an external device) by using the IP filter.

Remote password

This function permits or prohibits access from the external device to the FX5 CPU module via the FX5-CCLGN-MS. This prevents unauthorized access to the FX5 CPU module from a remote location.

Point

The remote password is one method of preventing unauthorized access (such as program or data destruction) from an external device. It does not completely prevent unauthorized access. Take appropriate measures other than this function if the safety of the programmable controller system must be maintained against unauthorized access from an external device. Mitsubishi shall not be held liable for any system problems that may occur from unauthorized access.

Examples of measures for unauthorized access are as follows.

- Install a firewall.
- Install a personal computer as a relay station, and control the relay of send/receive data with an application program.
- Install an external device for which the access rights can be controlled as a relay station. (Contact the network service provider or equipment dealer for details on the external devices for which access rights can be controlled.)

4

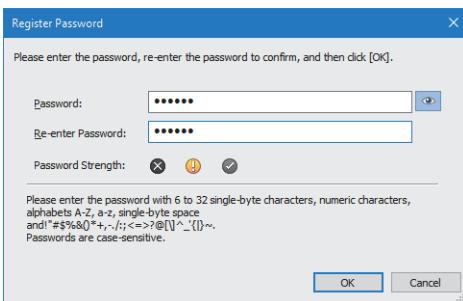
Number of settable modules

Up to three modules can be set for remote passwords.

Setting method

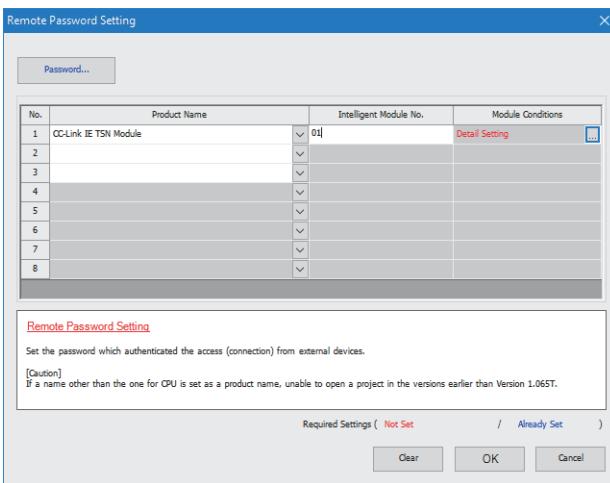
Set a remote password on the "Remote Password Setting" window.

Mouse [Navigation window] \Rightarrow [Parameter] \Rightarrow [Remote Password]

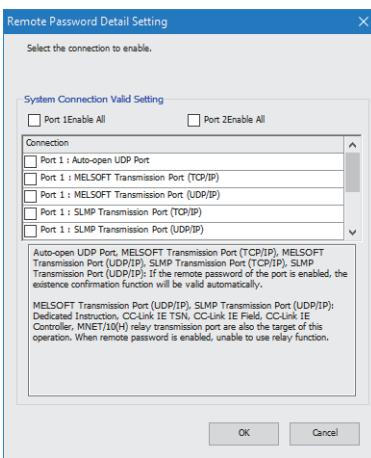


1. Click the [Password] button, and register the remote password on the "Register Password" window.

Mouse [Password] button



2. Select the module for which the remote password is to be applied, and set "Intelligent Module No.".



3. Set the target connection on the "Remote Password Detail Setting" window.

Mouse "Detail Setting" for the target module

4. Write the remote password to the FX5 CPU module.
5. The remote password is enabled when the FX5 CPU module is powered off and on or reset.

PING

This function uses the PING command to perform an alive check of external devices whose access is permitted in UDP communications. When this function is used for UDP communications, check if the security setting of external devices (such as a firewall) is set to respond to PING.

Access permitted/prohibited processing operation

The following describes the processing for permitting or prohibiting access from the external device to the FX5 CPU module with a remote password.

■Access permit processing (Unlock processing)

The external device trying to communicate unlocks the remote password set for the connected FX5-CCLGN-MS.

If the password is not unlocked, the FX5-CCLGN-MS to which the external device is connected prohibits access, so an error occurs in the external device.

The unlocking methods are as follows.

- SLMP dedicated command (Remote Password Unlock)
- Password input from engineering tool

■Access processing

Access to the specified station is possible when the remote password is correctly unlocked. Execute any access.

■Access prohibit processing (Lock processing)

When access to the specified station ends, lock the remote password from the external device to disable subsequent access.

The locking methods are as follows.

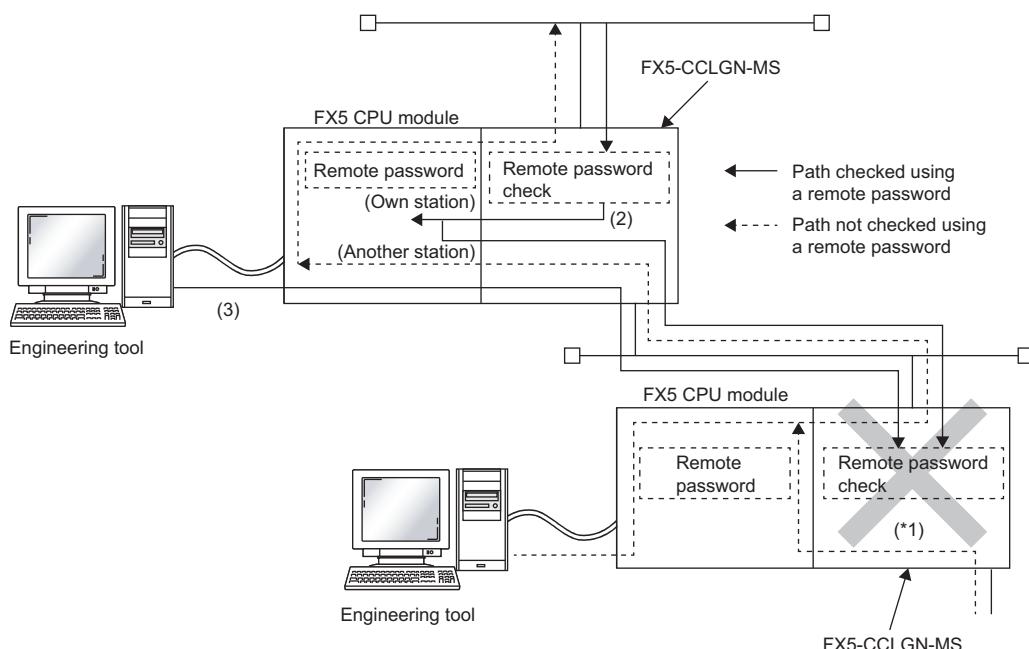
- SLMP dedicated command (Remote Password Lock)
- Lock with engineering tool (executed automatically)

Remote password check operation

■Communications that are checked

The FX5-CCLGN-MS checks the remote password for a communication request made to the own station or another station received from the external device.

When checking a remote password for modules with multiple connections, the connection for which the remote password is set is the target.



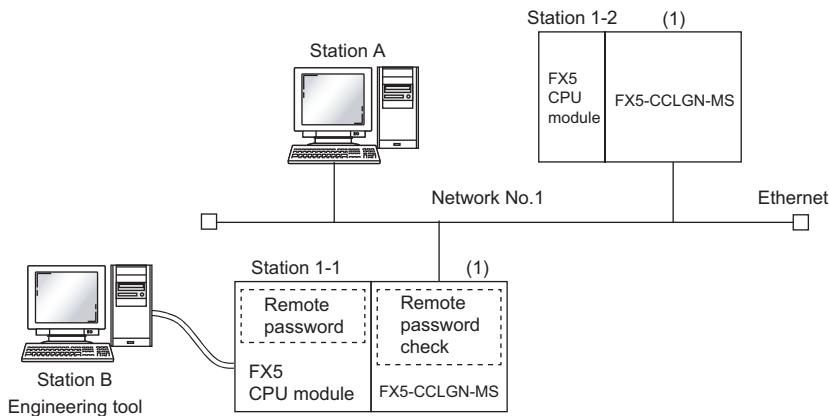
*1 Since the remote password check is set, the communication request from the external device is not accepted. If the remote password check is not set, the communication request can be accepted and data communications from the external device can be performed.

■ Accessible station

The station accessible from the external device when a remote password is set for the FX5 CPU module and the station that can unlock/lock the remote password are limited to those with the same network number.

The following figure shows an example when the remote password is set for multiple stations in the system.

Ex.



The password can be unlocked and locked by the following external devices.

- 1-1 station (1): A station only

The A station can access the \bigcirc station after the remote password for 1-1 station (1) is unlocked. The \triangle station can be accessed if the communication line is open.

The B station can access the \triangle station if the communication line is open.

\bigcirc : Station accessible from external device after remote password is unlocked

\triangle : Station accessible from external device even if remote password is not unlocked

External device (Request source)	Target programmable controller (request destination)	
	1-1 station CPU	1-2 station CPU
A station	\bigcirc	\triangle
B station	\triangle	\triangle

Precautions

The following describes the precautions when remote password is used.

■Setting of remote password for connection

Set the remote password for the connection used for data communications with an external device that can execute the unlock/lock processing.

■When remote password is set for UDP/IP connection

- Determine the external device to communicate with and perform data communications. (With UDP/IP, after the remote password is unlocked, data can be exchanged with devices other than the unlocked external device too. Determine the communication destination before starting to use.)
- Always lock the remote password after data communication is finished. (If the remote password is not locked, the unlocked state is held until timeout occurs.)

■TCP/IP close processing

If the TCP/IP is closed before the TCP/IP is locked, the FX5 CPU module will automatically start the lock processing.

■Remote password valid range

The remote password is valid only for access from the FX5-CCLGN-MS for which the parameters are set. In a system configuration in which multiple modules are used, set a remote password for each module which requires a remote password.

■Accessing the programmable controller of another station

When the external device is accessing the programmable controller of another station via the FX5-CCLGN-MS, accessing the programmable controller may not be possible if a remote password is set for the FX5 CPU module at the relay station or station to be accessed.

4.6 RAS

RAS stands for Reliability, Availability, and Serviceability. This function improves overall usability of automated equipment.

Slave station disconnection

Data link of the station where an error occurred is stopped, and the data link continues only for stations that are operating normally.

Automatic return

The data link is automatically restarted when the slave station that was disconnected due to an error becomes normal again.

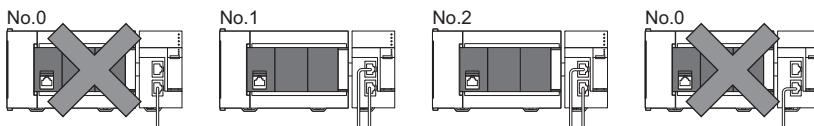
Precautions

- When removing a slave station while the system is operating, check that the slave station is either performing cyclic transmission or is disconnected.
- When removing the FX5-CCLGN-MS, check that the D LINK LED is either on or off.

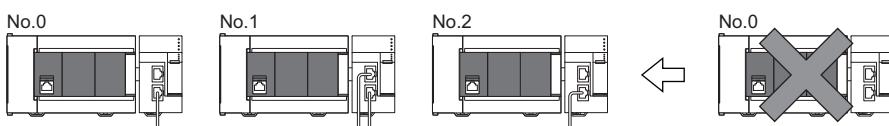
Master station duplication detection

When one network has multiple master stations, duplication is detected.

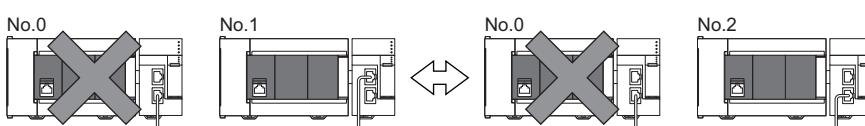
- When multiple master stations are simultaneously powered on, or when multiple master stations are simultaneously connected, Master station duplication (error code: 300FH) is detected in all master stations and cyclic transmission cannot be performed in any stations.



- When another master station is added to the network during data link, Master station duplication (error code: 300FH) is detected in the added master station and cyclic transmission cannot be performed. Other stations continue data link.



- When two networks are connected during data link, Master station duplication (error code: 300FH) is detected in master stations on both networks and cyclic transmission cannot be performed in any stations.



IP address duplication detection

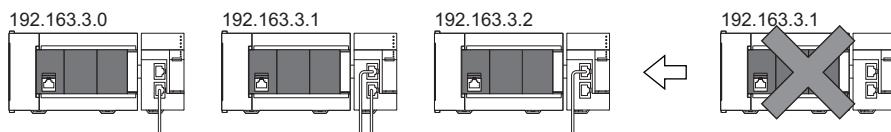
When one network has stations with the same IP address, duplication is detected.

Precautions

When IP address duplication is detected in the master station (error codes: 1802H, 3021H), change the IP address of the corresponding station, and power off and on the master station, or reset it.

Detection in each station

When adding a slave station, if a station with the same IP address already exists, IP address duplication (error code: 2160H) is detected in a station to be added, and data link cannot be performed. (Other stations continue data link.)



4

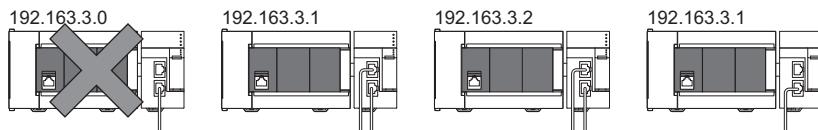
Precautions

When adding a slave station that is already connected (linked up) to the TSN switching hub for each TSN switching hub, IP address duplication will not be detected in a station to be added. If IP address duplication (error code: 1802H) is detected in the master station, disconnect the relevant slave station from the network. Otherwise, multiple stations with the same IP address will exist on the same network, possibly leading to transient transmission being sent to an unintended station.

Detection in the master station

■At cyclic transmission startup

If the startup processing of cyclic transmission is executed by powering off and on the master station, when a station with the same IP address is in the network, IP address duplication (error code: 3021H) is detected in the master station, and data link cannot be performed.



■Cyclic transmission in progress

During cyclic transmission, IP address duplication is regularly checked in the master station. When there are overlapping IP addresses, IP address duplication (error code: 1802H) is detected in the master station, and cyclic transmission cannot be performed with the relevant slave station. (Other stations continue data link.)

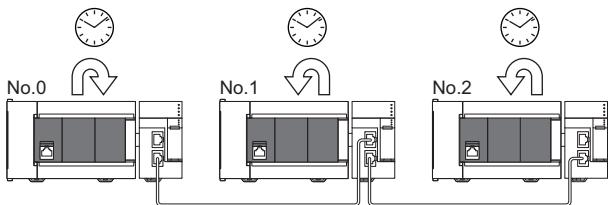
Precautions

In any of the following combinations, IP address duplication is not detected when cyclic transmission starts up in the master station.

- Ethernet device and CC-Link IE TSN device
- Ethernet device and Ethernet device

Time synchronization

The time of slave stations is synchronized with the time synchronization source (CPU module of the master station).



Setting method

The time synchronization is set to the buffer memory. (☞ Page 194 Time synchronization)

Set the same time zone to the CPU modules of the master and local stations.

Point

When the FX5-CCLGN-MS is used as the master station, do not connect time synchronization devices whose time synchronization priority is 0 to 15. For the priority verification method and setting method, refer to the manual of the time synchronization device.

Precautions

- When this function is used, the time setting function (SNTP client) of the Ethernet-equipped module cannot be used. (☞ MELSEC iQ-F FX5 User's Manual (Ethernet Communication))
- When time synchronization is also to be performed for the CPU module of the local station, time synchronization on the local station side needs to be set as well.
- When multiple FX5-CCLGN-MSs are mounted to an FX5 CPU module, set time synchronization for only one FX5-CCLGN-MS. When time synchronization is set for multiple, they are overwritten by the time that is synchronized later.

4.7 Others

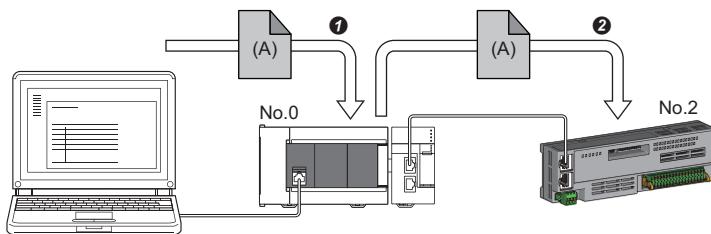
Slave station parameter automatic setting

This function saves parameters of the slave station in the master station, and automatically set the parameters when the slave station is connected or returned to the network.

Slave station parameter automatic setting from the master station

1. Parameters of the slave station set using the engineering tool are saved in the memory of the FX5 CPU module in the master station or the SD memory card by writing.
2. When the slave station is connected or returned to the network by power-on, saved parameters are automatically set from the master station.

4



Save parameter (A) of the slave station to the FX5 CPU module in the master station.

② When the slave station is returned/connected, saved parameter (A) is automatically set from the master station to the slave station.

Point

- The master station starts data link with the slave station after parameters of the slave station are automatically set.
- The slave station parameter automatic setting is also executed for slave stations set as reserved stations.

Setting method

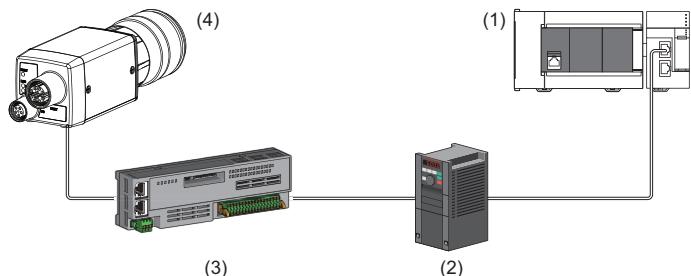
Set in the "Parameter of Slave Station" window. (☞ Page 104 Parameter processing of a slave station)

Precautions

- A slave station whose slave station parameter automatic setting abnormally ended does not start data link, and 'Execution result of slave station parameter automatic setting function' (SW0160 to SW0167) turns on. Check 'Detailed execution result of slave station parameter automatic setting' (SW0194) and the event history and perform corrective actions according to Action of the error codes list.
- Check if the checkbox of "Parameter Automatic Setting" of the slave station is selected in "Network Configuration Settings" under "Basic Settings".
- Check if the IP address of the slave station in the "Network Configuration settings" under "Basic Settings" matches the actual IP address of the slave station.
- When the communication speed differs between the master station and the station for which the slave station parameter automatic setting is performed, the slave station parameter automatic setting may end abnormally. When the setting ends abnormally, check that their communication speeds match.

5 SYSTEM CONFIGURATION

CC-Link IE TSN is configured using Ethernet cables. (☞ Page 88 Ethernet cable)



- (1) FX5-CCLGN-MS
- (2) Inverter device
- (3) Remote I/O module
- (4) Ethernet device (such as a vision sensor)

Precautions

To connect modules on CC-Link IE TSN, a dedicated TSN switching hub may be required depending on parameter settings or the network topology used.

Read the following carefully.

☞ Page 66 Structure of Authentication Class B Devices and Ethernet Devices

☞ Page 88 Switching hub

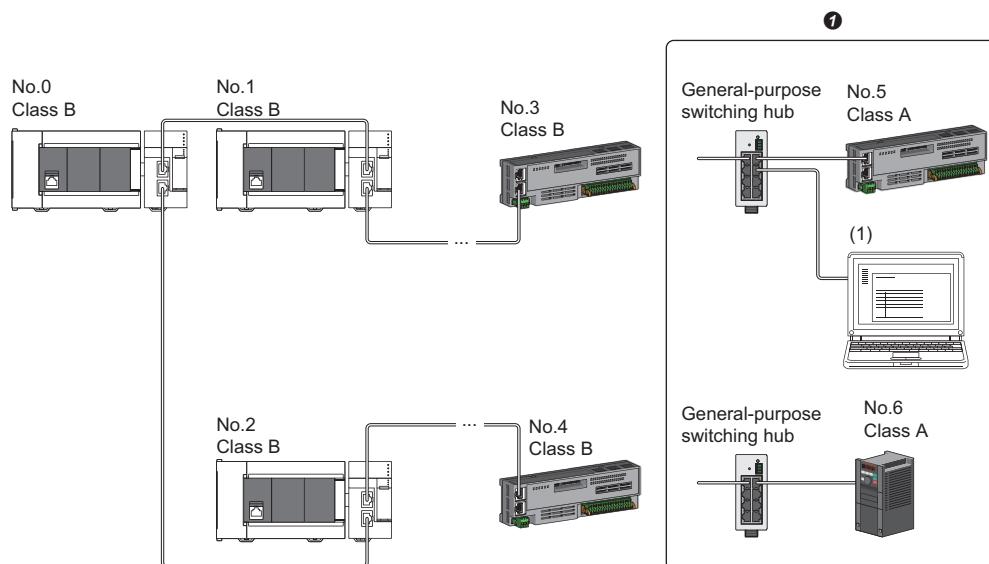
Authentication Class setting

From "Connection Device Information" under "Basic Settings" of the engineering tool, select either of the following items according to devices to be connected.

Connected device information	System configuration	Switching hub	Standard
Authentication Class B Only	Select this if the system is to be configured without connecting the authentication Class A device. <ul style="list-style-type: none"> ☞ Page 69 Connection with modules on CC-Link IE TSN only ☞ Page 73 Connection with modules on CC-Link IE TSN and Ethernet devices 	TSN switching hub (authentication Class B switching hub)	IEEE802.1AS
Mixture of Authentication Class B/A or Authentication Class A Only	Select this if the authentication Class A device or Ethernet device is connected to the structure with the authentication Class B device only. (☞ Page 82 Connection with modules on CC-Link IE TSN and Ethernet devices)	General-purpose switching hub (authentication Class B switching hub)	IEEE1588

When "Connection Device Information" is set to "Mixture of Authentication Class B/A or Authentication Class A Only", line topology can be used with the structure with the authentication Class B device only as shown below. To implement this setting, select this when connecting the authentication Class A device and Ethernet device after connecting a general-purpose switching hub to the end of the network of the authentication Class B device only.

5



No.0: Master station

No.1, No.2: Local station

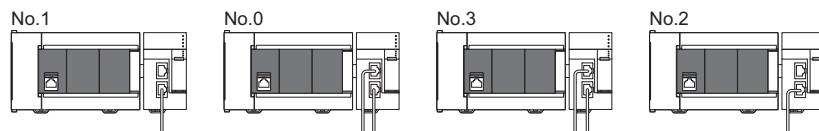
No.3, No.4, No.5, and No.6: Slave station

(1) Ethernet device

① When the authentication Class A device or Ethernet device is connected



Modules can be connected in any order regardless of the station number. No.□ shown in the following figure represents a station number.



Ethernet connection

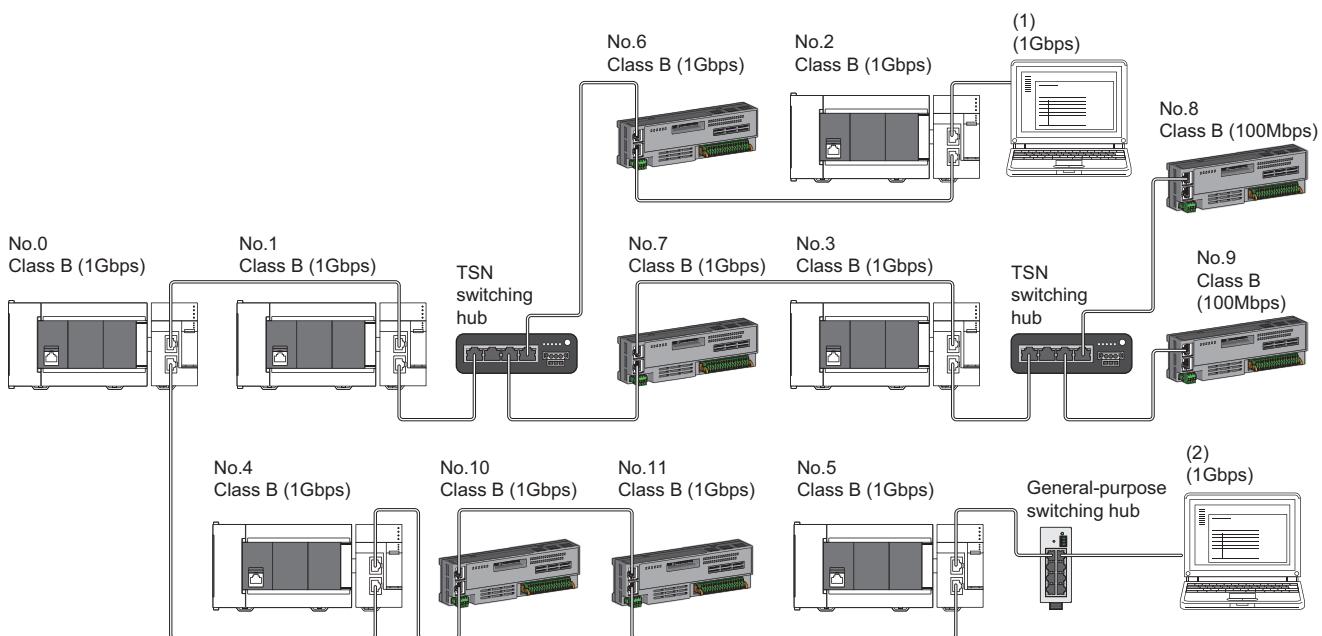
For connection with MELSOFT products and connection with SLMP-compatible devices, refer to the following.

☞ Page 23 Ethernet connection

5.1 Structure of Authentication Class B Devices and Ethernet Devices

This section describes the system configuration when "Connection Device Information" under "Basic Settings" of the engineering tool is set to "Authentication Class B Only".

When "Connection Device Information" under "Basic Settings" of the master station is set to "Authentication Class B Only", up to 61 devices (1 master station and 60 slave stations) can be connected.



No.0: Master station

No.1, No.2, No.3, No.4, and No.5: Local station

No.6, No.7, No.8, No.9, No.10, and No.11: Remote station

(1), (2): Ethernet device

Class B: Authentication Class B device

The availability of connection of network configuration devices varies depending on the communication mode and communication speed.

- Unicast mode

☞ Page 67 When the communication speed for the master station is set to 1Gbps

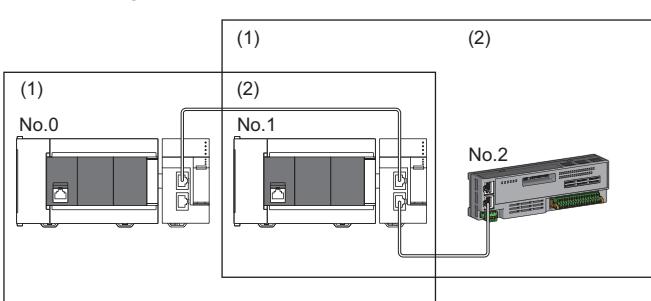
☞ Page 67 When the communication speed for the master station is set to 100Mbps

- Multicast mode

☞ Page 68 When the communication speed for the master station is set to 1Gbps

☞ Page 68 When the communication speed for the master station is set to 100Mbps

The following terms are used to describe the terms in the tables referenced.



No.0: Master station
No.1: Local station
No.2: Remote station
(1) Device on the master station side (The master station or a device near the master station)
(2) Device on the end side (A device far from the master station)

Structure of unicast mode

This mode indicates the availability of connection with a network configuration device when "Communication Mode" under "Application Settings" is set to "Unicast".

When the communication speed for the master station is set to 1Gbps

The following table lists the availability of connection with a network configuration device when the communication speed for the master station is set to 1Gbps.

○: Connection available, △: Connection available via a switching hub, ×: Connection not available

S: TSN switching hub available

H: General-purpose switching hub available

Device on the master station side (A device near the master station)		Device on the end side (A device far from the master station)					
		Local station (Authentication Class B device)		Remote station (Authentication Class B device)		Ethernet device	
		1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps
Master station (Authentication Class B device)	1Gbps	○S	×	○S	△S ^{*1}	○SH	△SH
Local station (Authentication Class B device)	1Gbps	○S	×	○S	△S ^{*1*2}	○SH	△SH
	100Mbps	×	×	×	×	×	×
Remote station (Authentication Class B device)	1Gbps	○S	×	○S	△S ^{*1*2}	○SH	△SH
	100Mbps	×	×	×	○S ^{*1*2}	×	○SH

*1 For a slave station with a communication speed of 100Mbps, set "Communication Period Setting" to "Low-Speed".

*2 Connection cannot be made if the total cyclic data size of all slave stations on the 100Mbps device side, including the devices with a communication speed of 100Mbps that form a boundary between the communication speed of 1Gbps and 100Mbps, exceeds 2K bytes.
( Page 84 Calculation of the total cyclic data size)

Precautions

When a TSN switching hub is used, check the TSN switching hub specifications on the CC-Link Partner Association website (www.cc-link.org).

When the communication speed for the master station is set to 100Mbps

When the communication speed for the master station is set to 100Mbps, the FX5-CCLGN-MS cannot be connected.

Structure of multicast mode

This mode indicates the availability of connection with a network configuration device when "Communication Mode" under "Application Settings" is set to "Multicast".

When the communication speed for the master station is set to 1Gbps

The following table lists the availability of connection with a network configuration device when the communication speed for the master station is set to 1Gbps.

○: Connection available, △: Connection available via a switching hub, ×: Connection not available

S: TSN switching hub available

H: General-purpose switching hub available

Device on the master station side (A device near the master station)		Device on the end side (A device far from the master station)					
		Local station (Authentication Class B device)		Remote station (Authentication Class B device)		Ethernet device	
		1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps
Master station (Authentication Class B device)	1Gbps	○S ^{*2*4}	×	○S ^{*2*4}	△S ^{*2*5}	○SH ^{*3}	△SH ^{*3}
Local station (Authentication Class B device)	1Gbps	○S ^{*2*4}	×	○S ^{*2*4}	△S ^{*2*5}	○SH	△SH
	100Mbps	×	×	×	×	×	×
Remote station (Authentication Class B device)	1Gbps	○S ^{*2*4}	×	○S ^{*2*4}	△S ^{*2*5}	○SH ^{*3}	△SH ^{*3}
	100Mbps	×	×	×	○S ^{*2*5}	×	○SH ^{*3}

*1 For a slave station with a communication speed of 100Mbps, set "Communication Period Setting" to "Low-Speed".

*2 Slave stations with different communication speeds of 1Gbps and 100Mbps cannot be connected on the end side via the switching hub.

*3 Because cyclic data is sent to the Ethernet device when the Ethernet device is connected to the master station or remote station, communications may not be performed depending on the type of the Ethernet device.

*4 Because cyclic data is sent to an Ethernet device when a local station or remote station is used with an Ethernet device on the end side via a switching hub, communication may not be possible depending on the type of an Ethernet device.

*5 Connection cannot be made if the total cyclic data size of all slave stations on the 100Mbps device side, including the devices with a communication speed of 100Mbps that form a boundary between the communication speed of 1Gbps and 100Mbps, exceeds 2K bytes.
( Page 84 Calculation of the total cyclic data size)

Precautions

When a TSN switching hub is used, check the TSN switching hub specifications on the CC-Link Partner Association website (www.cc-link.org).

When the communication speed for the master station is set to 100Mbps

When the communication speed for the master station is set to 100Mbps, the FX5-CCLGN-MS cannot be connected.

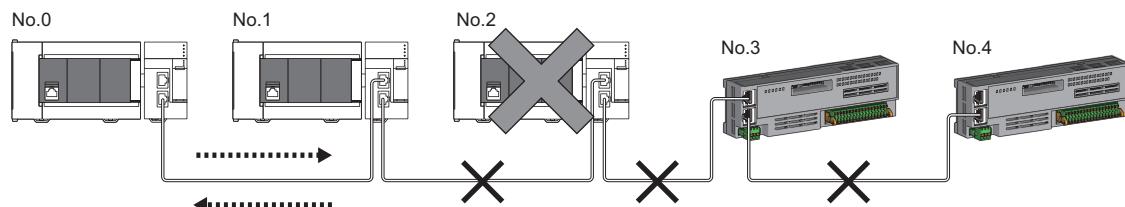
Structure with modules on CC-Link IE TSN only

Connection with modules on CC-Link IE TSN only

■Line topology

The network is configured in a line topology. A TSN switching hub is not required.

When an error occurs in a slave station, the stations connected after the faulty station will be disconnected.



No.0: Master station

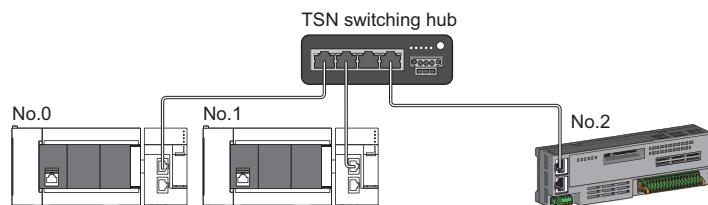
No.1, No.2: Local station

No.3, No.4: Remote station

5

■Star topology

The network is configured in a star topology via a TSN switching hub. This allows devices to be added easily.



No.0: Master station

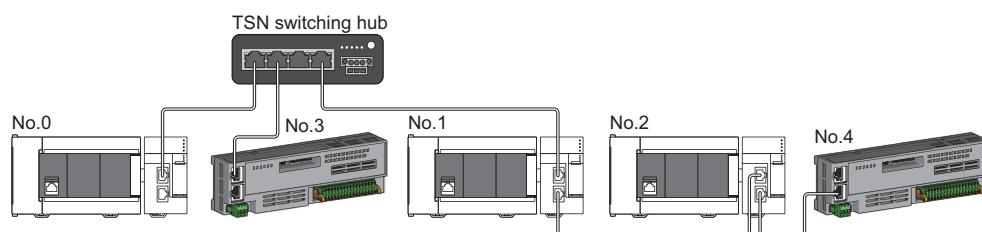
No.1: Local station

No.2: Remote station

Even when an error occurs in a slave station, a data link can be continued with the stations that are operating normally.

■Coexistence of line and star topologies

Line and star topologies can be mixed in the same network configuration.



No.0: Master station

No.1, No.2: Local station

No.3, No.4: Remote station

Connection with modules on CC-Link IE TSN with a communication speed of 100Mbps

The following shows the network topologies when a CC-Link IE TSN module with a communication speed of 100Mbps is connected.

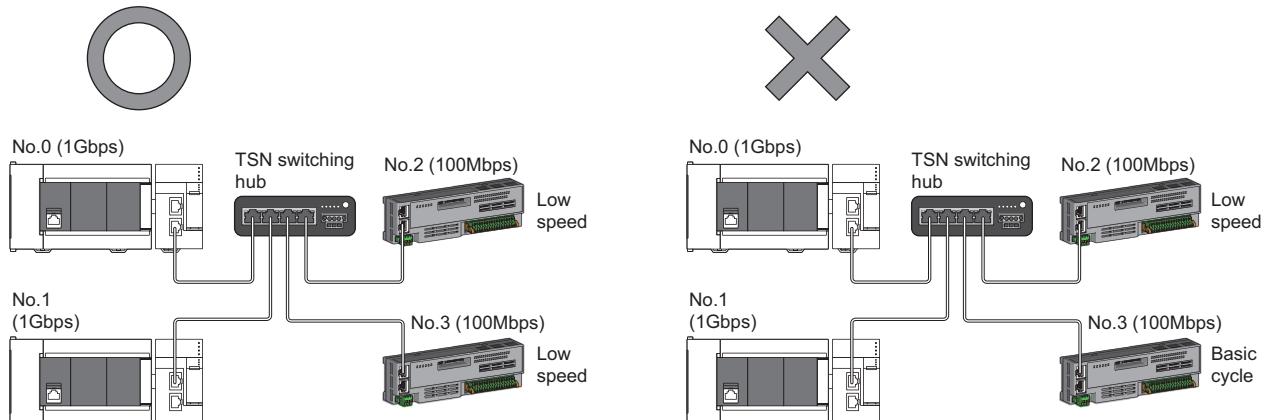
■Line topology

In a structure where a module with a communication speed of 100Mbps exists, the FX5-CCLGN-MS cannot be connected.

■Star topology

The network is configured in a star topology via a switching hub.

- When the master station with a communication speed of 1Gbps and a remote station with a communication speed of 100Mbps exist in the structure, set "Communication Period Setting" to "Low-Speed" for the remote station with a communication speed of 100Mbps.

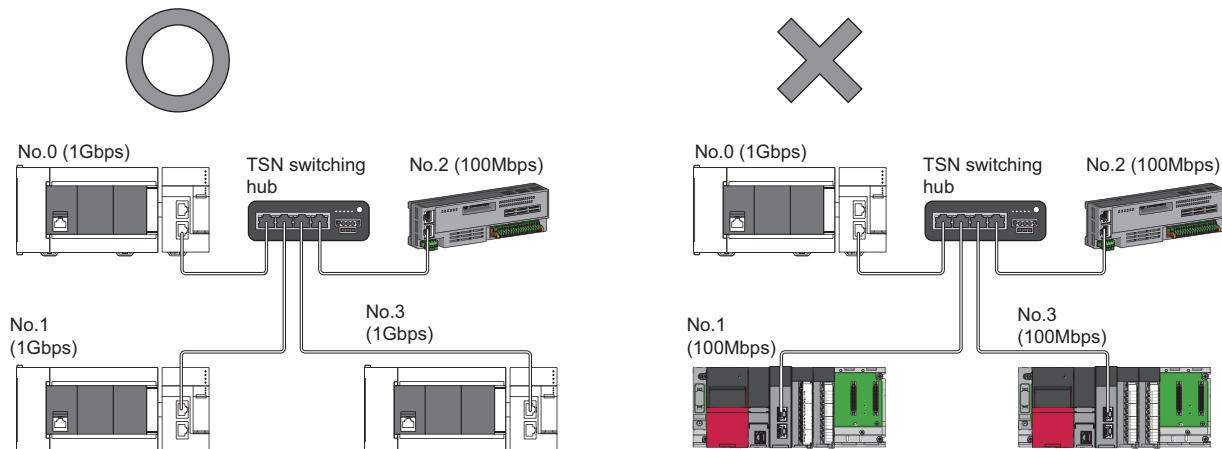


No.0: Master station

No.1: Local station

No.2, No.3: Remote station

- In a structure where a master or local station with a communication speed of 100Mbps exists, the FX5-CCLGN-MS cannot be connected.

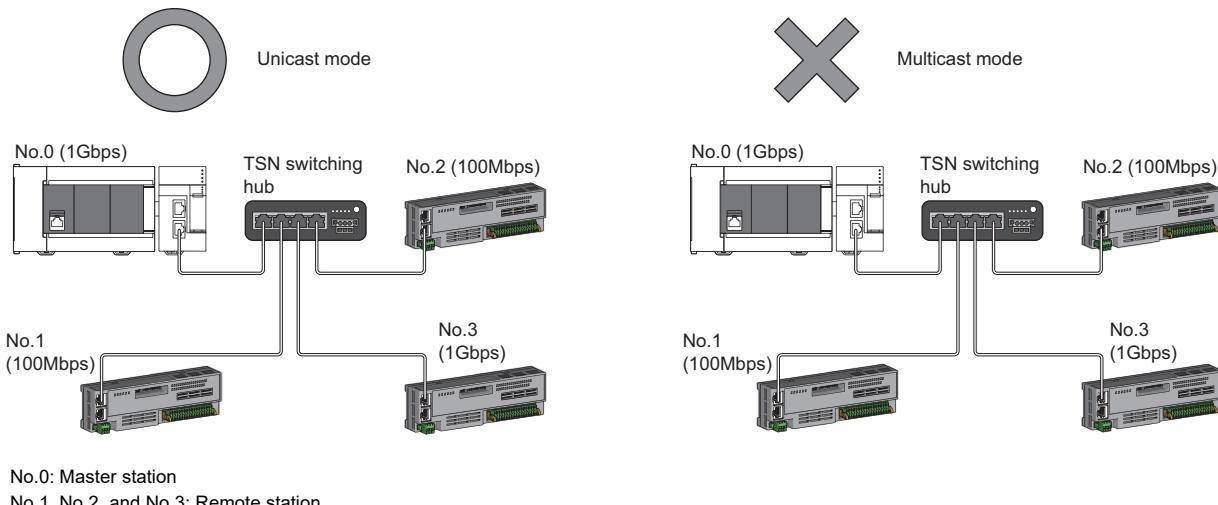


No.0: Master station

No.1, No.3: Local station

No.2: Remote station

- When "Communication Mode" is set to "Multicast" and "Communication Speed" of the master station is set to "1Gbps", the slave stations with different communication speeds of 1Gbps and 100Mbps cannot be connected on the end side via the switching hub.

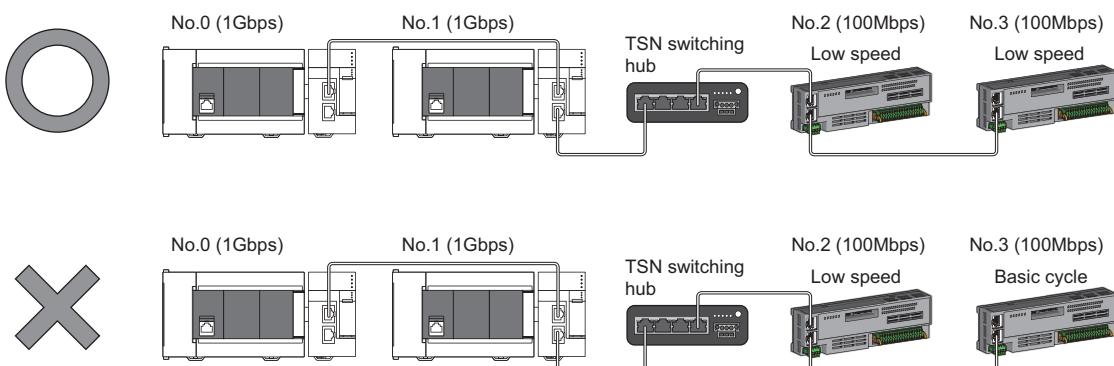


5

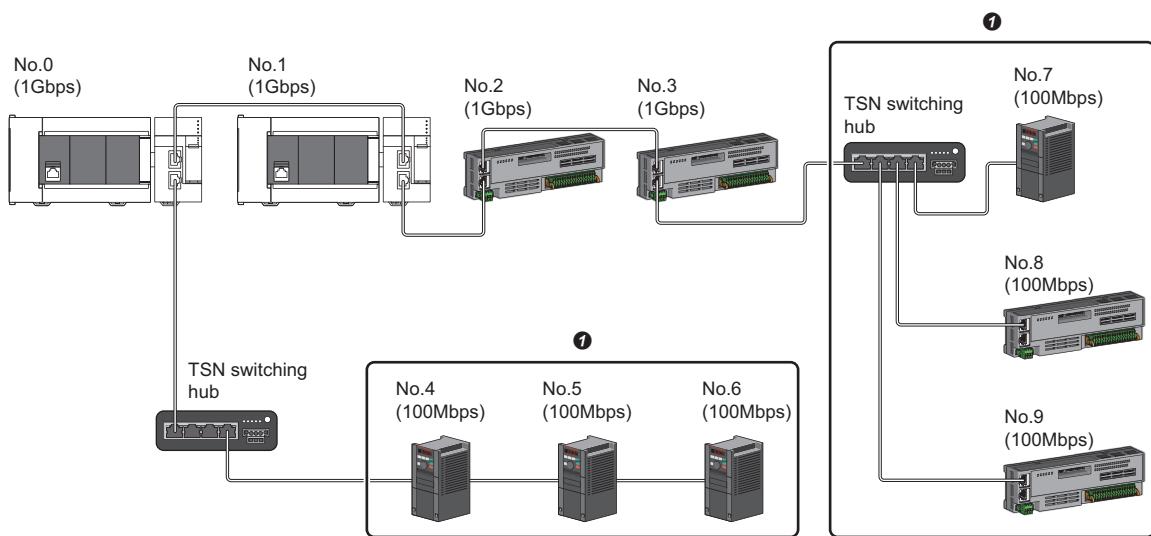
■Coexistence of line and star topologies

Line and star topologies can be mixed in the same network configuration.

- When the master station with a communication speed of 1Gbps and a remote station with a communication speed of 100Mbps exist in the structure, set "Communication Period Setting" to "Low-Speed" for the remote station with a communication speed of 100Mbps.



- When the communication speed for the master station is 1Gbps, connection cannot be made if the total cyclic data size of all slave stations on the 100Mbps device side, including the devices with a communication speed of 100Mbps that form a boundary between the communication speed of 1Gbps and 100Mbps, exceeds 2K bytes.



No.0: Master station

No.1: Local station

No.2, No.3, No.4, No.5, No.6, No.7, No.8, and No.9: Remote station

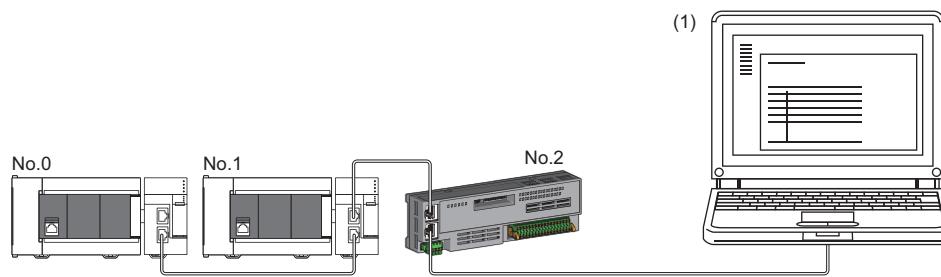
① Set the total cyclic data size within 2K bytes.

Structure with modules on CC-Link IE TSN and Ethernet devices

Connection with modules on CC-Link IE TSN and Ethernet devices

■Line topology

The network with modules and devices is configured in a line topology. A TSN switching hub is not required. Connect Ethernet devices to the end of the network.



5

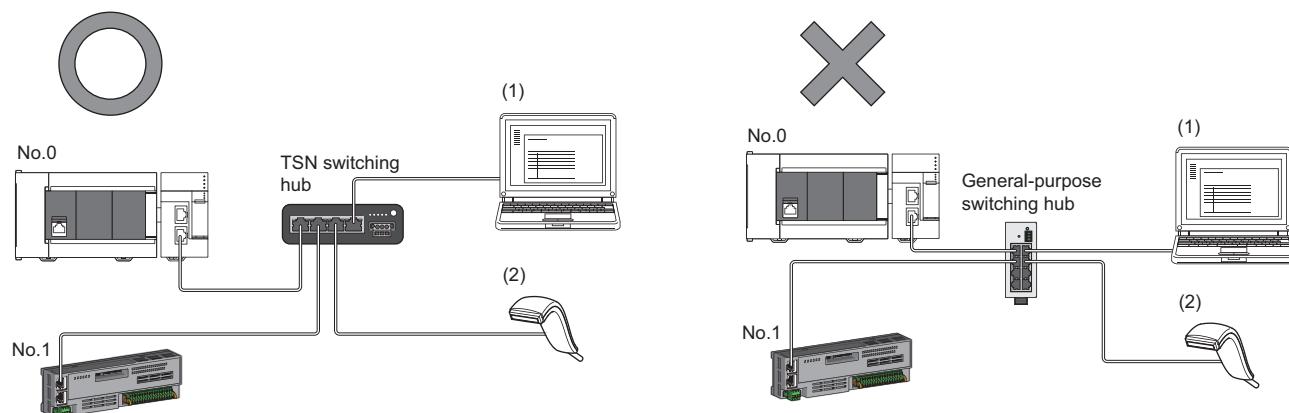
No.0: Master station
No.1: Local station
No.2: Remote station
(1) Ethernet device (such as a personal computer)

When an error occurs in a slave station, the stations connected after the faulty station will be disconnected.

■Star topology

The network is configured in a star topology via a switching hub.

Slave stations cannot be connected with a general-purpose switching hub. Line and star topologies should be mixed in the same network configuration.

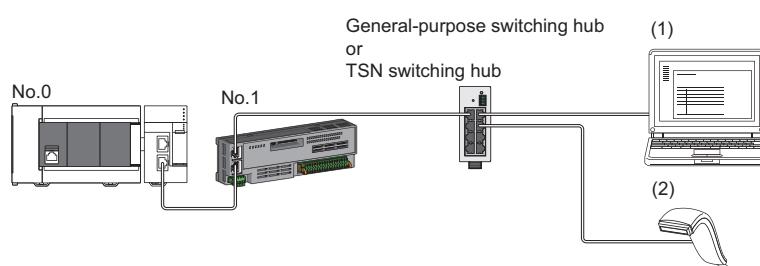


No.0: Master station
No.1: Remote station
(1), (2): Ethernet device

■Coexistence of line and star topologies

Line and star topologies can be mixed in the same network configuration.

- Connect Ethernet devices to the end of the network.

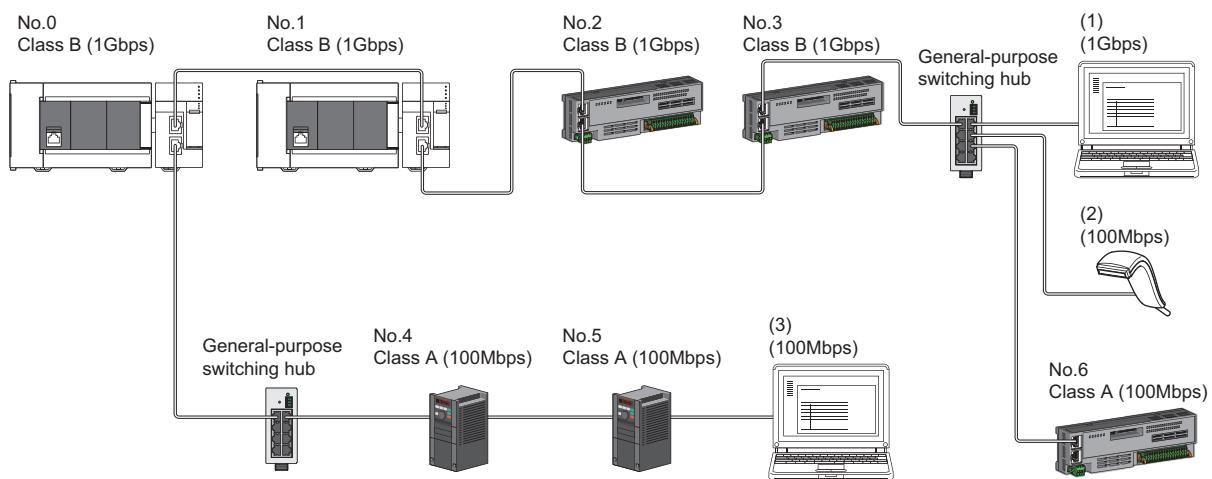


No.0: Master station
No.1: Remote station
(1), (2): Ethernet device

5.2 Structure of Authentication Class B/A Devices and Ethernet Devices

This section describes the system configuration when "Connection Device Information" under "Basic Settings" of the engineering tool is set to "Mixture of Authentication Class B/A or Authentication Class A Only".

When "Connection Device Information" under "Basic Settings" of the master station is set to "Mixture of Authentication Class B/A or Authentication Class A Only", up to 61 devices (1 master station and 60 slave stations) can be connected.



No.0: Master station

No.1: Local station

No.2, No.3, No.4, No.5, No.6: Remote station

(1), (2), (3): Ethernet device

Class A: Authentication Class A device

Class B: Authentication Class B device

The availability of connection of network configuration devices varies depending on the communication mode and communication speed.

- Unicast mode

☞ Page 75 When the communication speed for the master station is set to 1Gbps

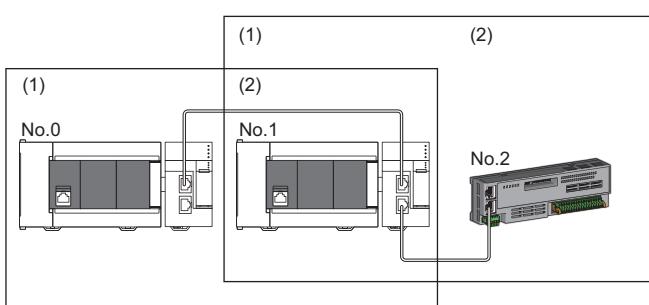
☞ Page 75 When the communication speed for the master station is set to 100Mbps

- Multicast mode

☞ Page 76 When the communication speed for the master station is set to 1Gbps

☞ Page 76 When the communication speed for the master station is set to 100Mbps

The following terms are used to describe the terms in the tables referenced.



No.0: Master station
No.1: Local station
No.2: Remote station
(1) Device on the master station side (The master station or a device near the master station)
(2) Device on the end side (A device far from the master station)

Structure of unicast mode

This mode indicates the availability of connection with a network configuration device when "Communication Mode" under "Application Settings" is set to "Unicast".

When the communication speed for the master station is set to 1Gbps

The following table lists the availability of connection with a network configuration device when the communication speed for the master station is set to 1Gbps.

○: Connection available, △: Connection available via a switching hub, ×: Connection not available

H: General-purpose switching hub available

Device on the master station side (A device near the master station)		Device on the end side (A device far from the master station)									
		Local station (Authentication Class B device)		Remote station (Authentication Class B device)		Local station (Authentication Class A device)		Remote station (Authentication Class A device)		Ethernet device	
		1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps
Master station (Authentication Class B device)	1Gbps	○	×	○	×	○H	×	○H	△H ¹	○H	△H
Local station (Authentication Class B device)	1Gbps	○	×	○	×	○H ²	×	○H ²	△H ¹⁺²	○H	△H
	100Mbps	×	×	×	×	×	×	×	×	×	×
Remote station (Authentication Class B device)	1Gbps	○	×	○	×	○H ²	×	○H ²	△H ¹⁺²	○H	△H
	100Mbps	×	×	×	×	×	×	×	×	×	×
Local station (Authentication Class A device)	1Gbps	×	×	×	×	○H ²	×	○H ²	△H ¹⁺²	○H	△H
	100Mbps	×	×	×	×	×	×	×	×	×	×
Remote station (Authentication Class A device)	1Gbps	×	×	×	×	○H ²	×	○H ²	△H ¹⁺²	○H	△H
	100Mbps	×	×	×	×	×	×	×	○H ¹⁺²	×	○H

*1 For a slave station with a communication speed of 100Mbps, set "Communication Period Setting" to "Low-Speed".

*2 Connection cannot be made if the total cyclic data size of all slave stations on the authentication Class A device side that form a boundary between authentication Class B and authentication Class A exceeds 2K bytes. (☞ Page 84 Calculation of the total cyclic data size)

Precautions

When a TSN switching hub is used, check the TSN switching hub specifications on the CC-Link Partner Association website (www.cc-link.org).

When the communication speed for the master station is set to 100Mbps

When the communication speed for the master station is set to 100Mbps, the FX5-CCLGN-MS cannot be connected.

Structure of multicast mode

This mode indicates the availability of connection with a network configuration device when "Communication Mode" under "Application Settings" is set to "Multicast".

When the communication speed for the master station is set to 1Gbps

The following table lists the availability of connection with a network configuration device when the communication speed for the master station is set to 1Gbps.

○: Connection available, △: Connection available via a switching hub, ×: Connection not available

H: General-purpose switching hub available

Device on the master station side (A device near the master station)		Device on the end side (A device far from the master station)									
		Local station (Authentication Class B device)		Remote station (Authentication Class B device)		Local station (Authentication Class A device)		Remote station (Authentication Class A device)		Ethernet device	
		1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps	1Gbps	100Mbps
Master station (Authentication Class B device)	1Gbps	○	×	○	×	○H ^{*2*3}	×	○H ^{*2*5*7}	△H ^{*1*2*5*7}	○H ^{*4*6}	△H ^{*4*6}
Local station (Authentication Class B device)	1Gbps	○	×	○	×	○H ^{*2*3}	×	○H ^{*2*3*5}	△H ^{*1*2*3*5}	○H ^{*4}	△H ^{*4}
	100Mbps	×	×	×	×	×	×	×	×	×	×
Remote station (Authentication Class B device)	1Gbps	○	×	○	×	○H ^{*2*3}	×	○H ^{*2*3*5*7}	△H ^{*1*2*3*5*7}	○H ^{*4*6}	△H ^{*4*6}
	100Mbps	×	×	×	×	×	×	×	×	×	×
Local station (Authentication Class A device)	1Gbps	×	×	×	×	○H ^{*2*3}	×	○H ^{*2*3*5*7}	△H ^{*1*2*3*5*7}	○H ^{*4*6}	△H ^{*4*6}
	100Mbps	×	×	×	×	×	×	×	×	×	×
Remote station (Authentication Class A device)	1Gbps	×	×	×	×	×	×	○H ^{*2*3*5*7}	△H ^{*1*2*3*5*7}	○H ^{*4*6}	△H ^{*4*6}
	100Mbps	×	×	×	×	×	×	○H ^{*1*2*3*5*7}	×	○H ^{*4*6}	○H ^{*4*6}

*1 For a slave station with a communication speed of 100Mbps, set "Communication Period Setting" to "Low-Speed".

*2 Slave stations with different communication speeds of 1Gbps and 100Mbps cannot be connected on the end side via the switching hub.

*3 Connection cannot be made if the total cyclic data size of all slave stations on the authentication Class A device side that form a boundary between authentication Class B and authentication Class A exceeds 2K bytes. (Page 84 Calculation of the total cyclic data size)

*4 Because cyclic data is sent to an Ethernet device when a local station is used with an Ethernet device on the end side via a switching hub, communication may not be possible depending on the type of an Ethernet device.

*5 Because cyclic data is sent to an authentication Class A remote station when a local station is used with an authentication Class A remote station on the end side via a switching hub, communication may not be possible depending on the type of the authentication Class A remote station.

*6 Because cyclic data is sent to the Ethernet device when the Ethernet device is connected to the master station, remote station, or authentication Class A local station, communications may not be performed depending on the type of the Ethernet device.

*7 Because cyclic data is sent to the authentication Class A remote station when the authentication Class A remote station is connected to the master station, remote station, or authentication Class A local station, communications may not be performed depending on the type of the authentication Class A remote station.

Precautions

When a TSN switching hub is used, check the TSN switching hub specifications on the CC-Link Partner Association website (www.cc-link.org).

When the communication speed for the master station is set to 100Mbps

When the communication speed for the master station is set to 100Mbps, the FX5-CCLGN-MS cannot be connected.

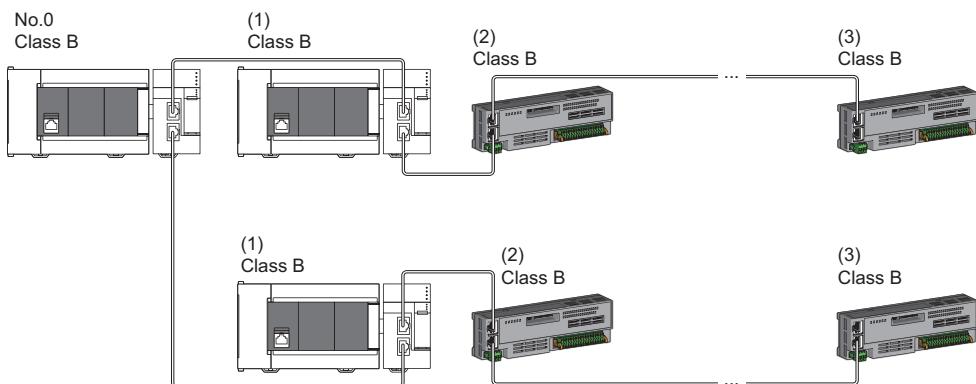
Structure with modules on CC-Link IE TSN

Connection with modules on CC-Link IE TSN only

■Line topology

The network is configured in a line topology.

- Up to eight authentication Class B devices can be connected to P1 or P2 of the master station.



5

No.0: Master station

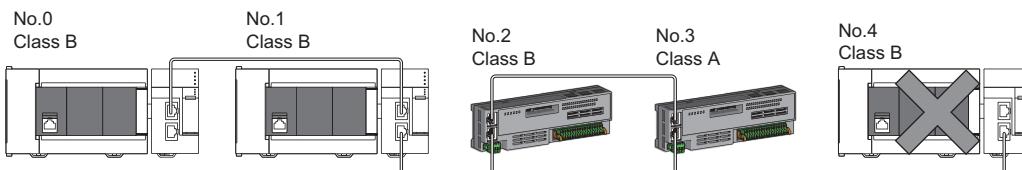
(1) Local station (1st device)

(2) Remote station (2nd device)

(3) Remote station (8th device)

Class B: Authentication Class B device

- The authentication Class B device cannot be connected to the authentication Class A device.



No.0: Master station

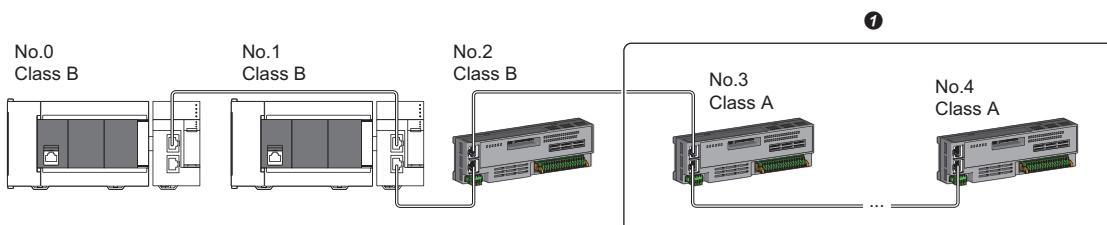
No.1, No.4: Local station

No.2, No.3: Remote station

Class A: Authentication Class A device

Class B: Authentication Class B device

- Connection cannot be made if the total cyclic data size of all slave stations on the authentication Class A device side that form a boundary between authentication Class B and authentication Class A exceeds 2K bytes.



No.0: Master station

No.1: Local station

No.2, No.3, and No.4: Remote station

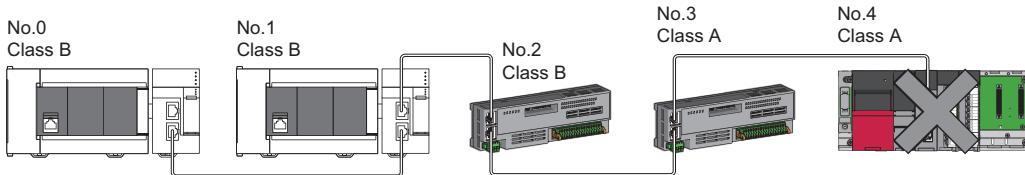
Class A: Authentication Class A device

Class B: Authentication Class B device

- ① Set the total cyclic data size within 2K bytes.

- When "Communication Mode" is set to "Multicast", the local station cannot be connected to the authentication Class A remote station.

Multicast mode



No.0: Master station

No.1, No.4: Local station

No.2, No.3: Remote station

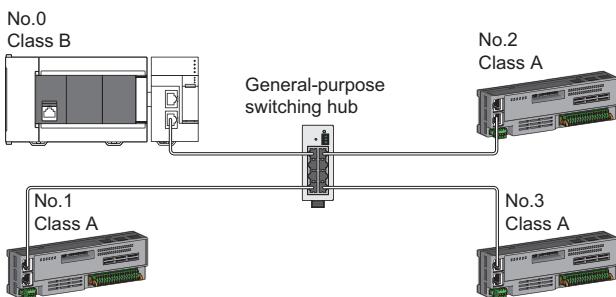
Class A: Authentication Class A device

Class B: Authentication Class B device

■Star topology

The network is configured in a star topology via a switching hub.

- To connect an authentication Class A device to an authentication Class B device in a star topology or to connect an authentication Class A device to an authentication Class A device in a star topology, connect them via a general-purpose switching hub.



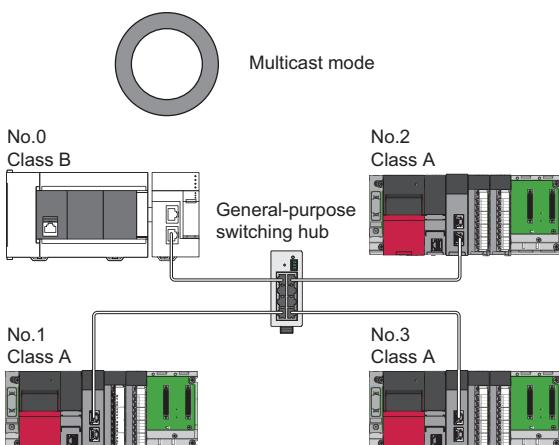
No.0: Master station

No.1, No.2, and No.3: Remote station

Class A: Authentication Class A device

Class B: Authentication Class B device

- When "Communication Mode" is set to "Multicast", the local station cannot be used with an authentication Class A remote station on the end side via a switching hub.



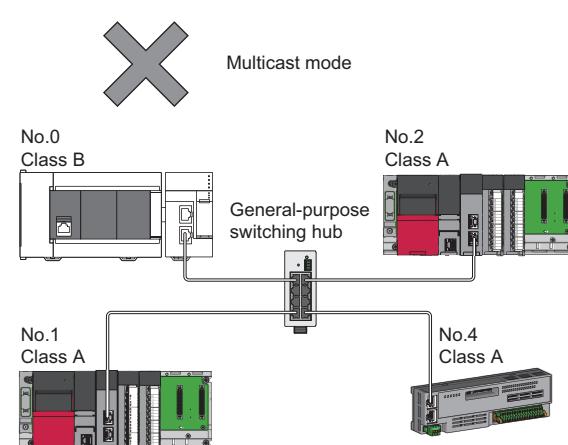
No.0: Master station

No.1, No.2, and No.3: Local station

No.4: Remote station

Class A: Authentication Class A device

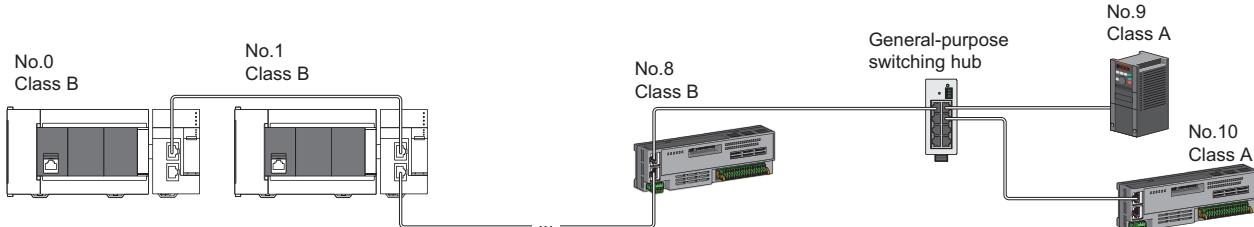
Class B: Authentication Class B device



■Coexistence of line and star topologies

Line and star topologies can be mixed according to the availability of connection as described below.

- Up to eight slave stations of authentication Class B can be connected to the transmission path from the master station to the authentication Class B device of the end.
- To connect an authentication Class B device, line topology or star topology using P1 or P2 of the master station is required.
(The authentication Class B device cannot be connected to the authentication Class A device.)



No.0: Master station

No.1: Slave station (1st station)

No.8: Slave station (8th station)

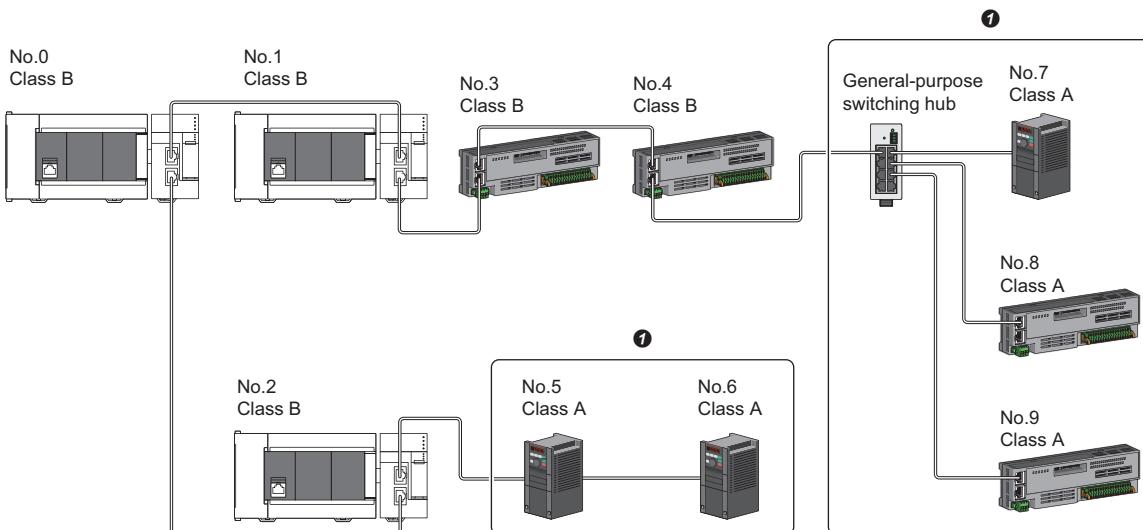
No.9, No.10: Remote station

Class A: Authentication Class A device

Class B: Authentication Class B device

5

- Connection cannot be made if the total cyclic data size of all slave stations on the authentication Class A device side that form a boundary between authentication Class B and authentication Class A exceeds 2K bytes.



No.0: Master station

No.1, No.2: Local station

No.3, No.4, No.5, No.6, No.7, No.8, and No.9: Remote station

Class A: Authentication Class A device

Class B: Authentication Class B device

⑦ Set the total cyclic data size within 2K bytes.

Connection with modules on CC-Link IE TSN with a communication speed of 100Mbps

This section describes the network topology when "Communication Speed" under "Application Settings" is set to "100Mbps".

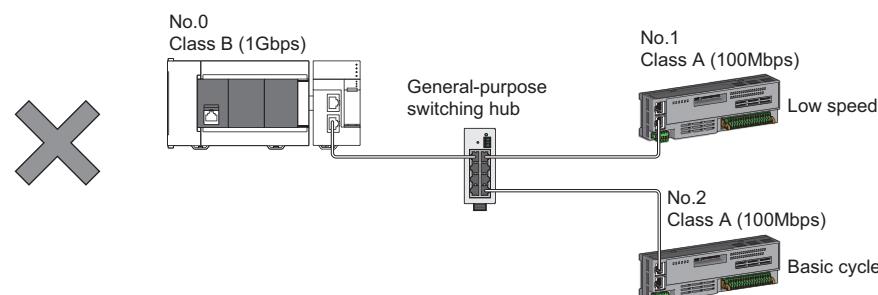
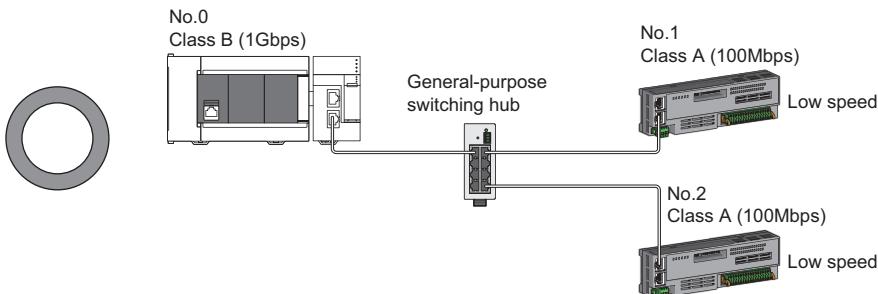
■Line topology

In a structure where a module with a communication speed of 100Mbps exists, the FX5-CCLGN-MS cannot be connected.

■Star topology

The network is configured in a star topology via a switching hub.

- When the master station with a communication speed of 1Gbps and a remote station with a communication speed of 100Mbps exist in the structure, set "Communication Period Setting" to "Low-Speed" for the remote station with a communication speed of 100Mbps.



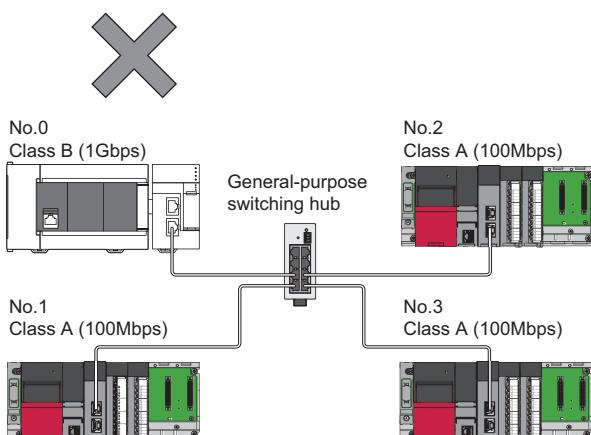
No.0: Master station

No.1, No.2: Remote station

Class A: Authentication Class A device

Class B: Authentication Class B device

- In a structure where a master or local station with a communication speed of 100Mbps exists, the FX5-CCLGN-MS cannot be connected.



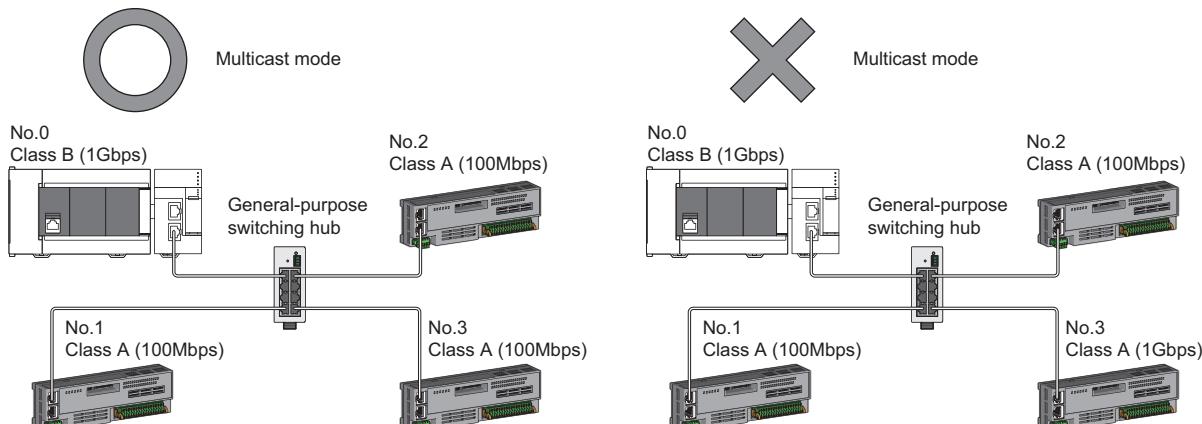
No.0: Master station

No.1, No.2, and No.3: Local station

Class A: Authentication Class A device

Class B: Authentication Class B device

- When "Communication Mode" is set to "Multicast" and the communication speed of the master station is set to "1Gbps", slave stations with different communication speeds of 1Gbps and 100Mbps cannot be connected on the end side via a switching hub.



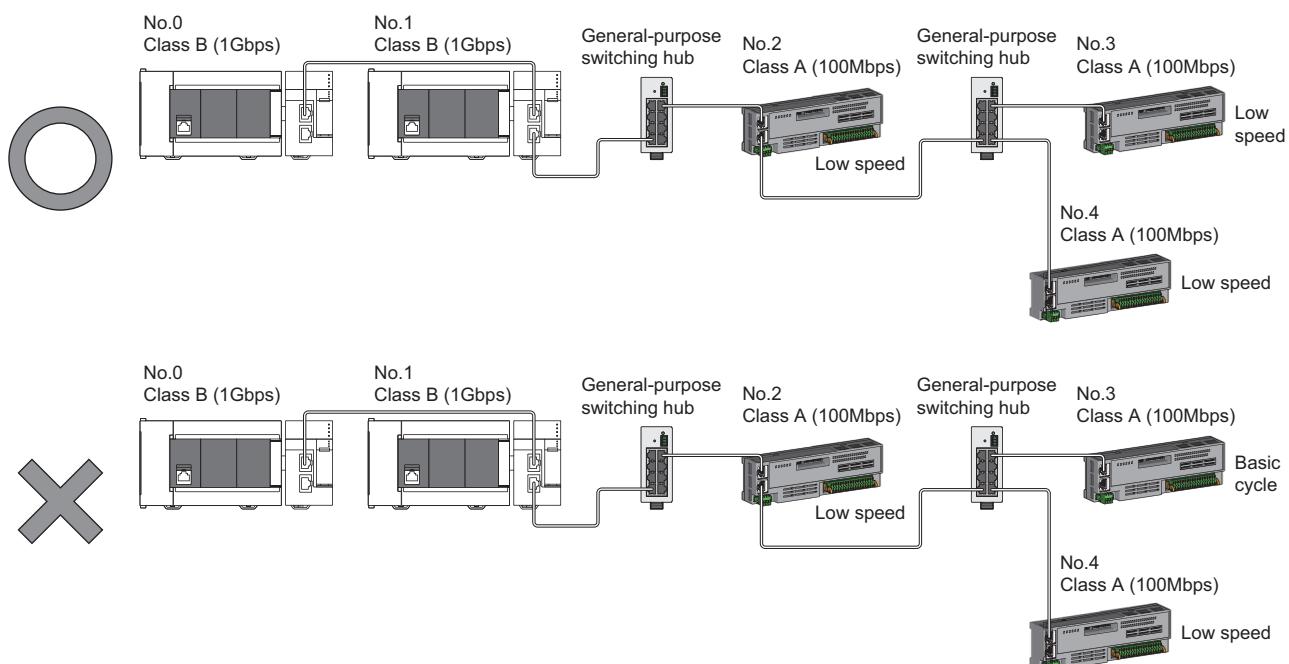
No.0: Master station
No.1, No.2, and No.3: Remote station
Class A: Authentication Class A device
Class B: Authentication Class B device

5

■Coexistence of line and star topologies

Line and star topologies can be mixed in the same network configuration.

- When the master station with a communication speed of 1Gbps and a remote station with a communication speed of 100Mbps exist in the structure, set "Communication Period Setting" to "Low-Speed" for the remote station with a communication speed of 100Mbps.



No.0: Master station
No.1: Local station
No.2, No.3, and No.4: Remote station
Class A: Authentication Class A device
Class B: Authentication Class B device

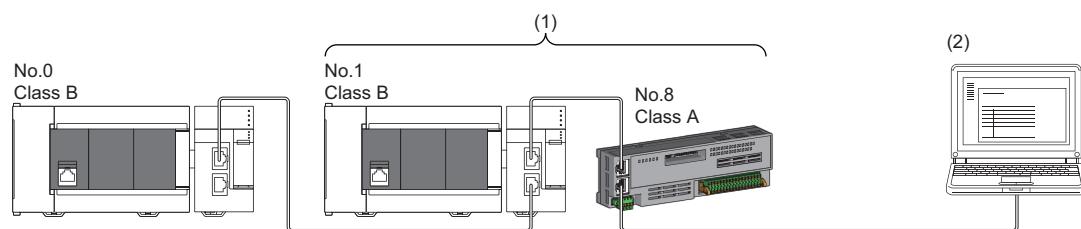
Structure with modules on CC-Link IE TSN and Ethernet devices

Connection with modules on CC-Link IE TSN and Ethernet devices

■Line topology

The network with modules and devices is configured in a line topology. A TSN switching hub is not required.

Up to eight modules on CC-Link IE TSN can be connected to P1 or P2 of the master station at the position indicated with (1). Connect Ethernet devices to the end of the network.



No.0: Master station

No.1: Local station (1st module)

No.8: Remote station (8th module)

(2) Ethernet device

Class A: Authentication Class A device

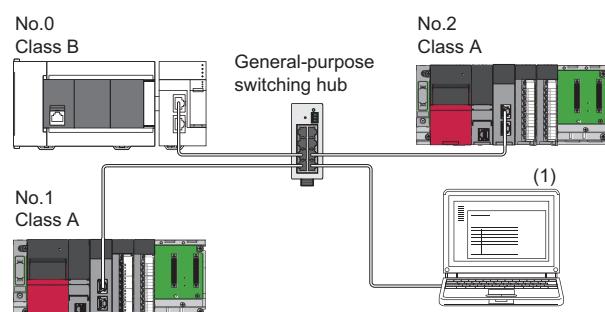
Class B: Authentication Class B device

When an error occurs in a slave station, the stations connected after the faulty station will be disconnected.

■Star topology

Modules or devices are connected in a star topology via a switching hub.

- Because cyclic data is sent to an Ethernet device when a local station is used with an Ethernet device on the end side via a switching hub, communication may not be possible depending on the type of an Ethernet device.



No.0: Master station

No.1, No.2: Local station

(1) Ethernet device

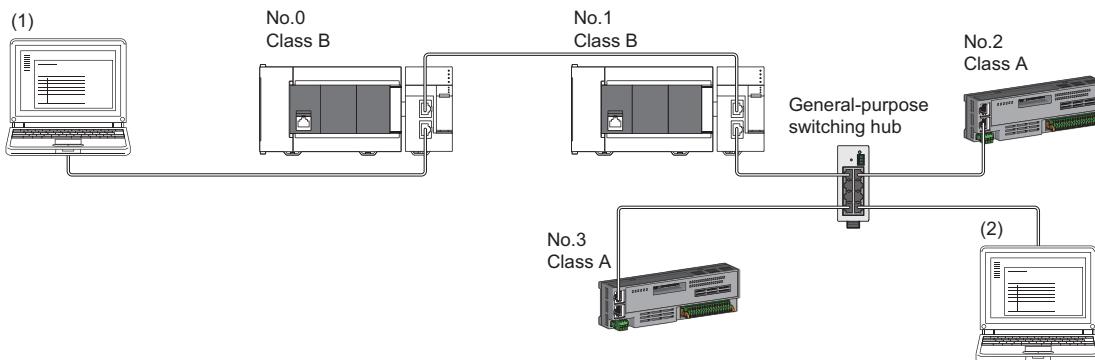
Class A: Authentication Class A device

Class B: Authentication Class B device

■Coexistence of line and star topologies

Line and star topologies can be mixed according to the availability of each connection.

- Connect Ethernet devices at the end of line topology.
- When connecting the Ethernet device in a star topology, connect the Ethernet device to the general-purpose switching hub.



No.0: Master station

No.1: Local station

No.2, No.3: Remote station

(1), (2): Ethernet device

Class A: Authentication Class A device

Class B: Authentication Class B device

5.3 Precautions for System Configuration

Devices connected to the same network

Do not connect the devices as described below. Doing so may cause the disconnection of all stations.

- A module on CC-Link IE TSN and a device having network types other than an Ethernet device (such as CC-Link IE Controller Network and CC-Link IE Field Network) are connected to the same network.
- A module on CC-Link IE TSN and an Ethernet device (such as a personal computer), both of which are on different networks, are connected to one switching hub.

Adding a slave station with no IP address setting

In a line topology, do not connect the slave station with no IP address setting at a place other than the end of the network. A data link may not be performed in the slave stations after the slave station with no IP address setting.

CC-Link IE TSN/CC-Link IE Field diagnostics

If operations such as the following are performed, the actual network configuration and the network map of the CC-Link IE TSN/CC-Link IE Field diagnostics may be a mismatch.

Network configuration	Operation
Star topology	<ul style="list-style-type: none">• Powering off and on a slave station or switching hub• Connecting/disconnecting an Ethernet cable connected to the switching hub• Disconnecting an Ethernet cable from a slave station and connecting it to another slave station or a switching hub• Disconnecting more than nine stations, or half the number of slave stations or more in the system• Changing the network topology when adding a slave station
Line topology	<ul style="list-style-type: none">• Simultaneously powering off/on multiple stations• Simultaneously connecting/disconnecting Ethernet cables to/from multiple stations (When a data link faulty station returns, a data link error will occur in all the stations.)• Disconnecting more than nine stations, or half the number of slave stations or more in the system• Changing the network topology when adding a slave station

Point

The actual network configuration and network map can be matched by executing the network map update of the CC-Link IE TSN/CC-Link IE Field diagnostics. ( Page 144 CC-Link IE TSN/CC-Link IE Field diagnostics)

Calculation of the total cyclic data size

The following shows the calculation formula of the total cyclic data size. The part of the variable surrounded by double quotes (" ") is the setting value of "Network Configuration Settings" under "Basic Settings".

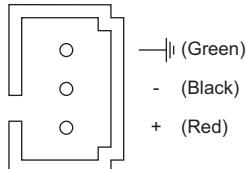
Total cyclic data size = $204 + (146 \times \text{Number of local stations}) + (106 \times \text{Number of remote stations}) + (\text{Number of "RX setting" points} \div 8) + (\text{Number of "RWr setting" points} \times 2)$ [byte]

6 WIRING

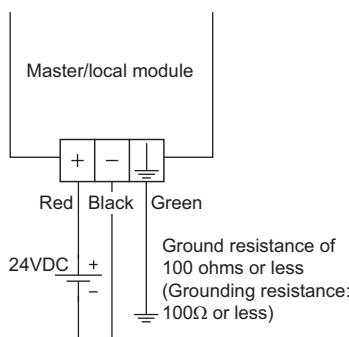
This chapter describes the wiring methods, wiring products, and wiring precautions when using the FX5-CCLGN-MS.

6.1 Power Supply Wiring

Power connector layout



Power supply wiring

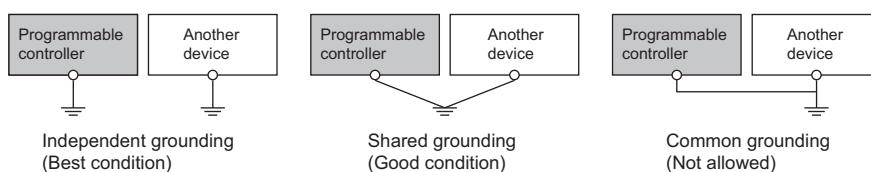


6

Grounding

Observe the following:

- Provide grounding with a ground resistance of 100Ω or less.
- Provide independent grounding when possible.
- If independent grounding cannot be provided, provide "shared grounding" as shown below.



- Keep the distance between the grounding point and the programmable controller as close as possible to shorten the length of ground cable.

6.2 CC-Link IE TSN Wiring

This section describes the wiring when using CC-Link IE TSN.

Wiring methods

The following describes connection and disconnection of the Ethernet cable.

■Connecting the cable

1. Power off the FX5-CCLGN-MS and the external device.
2. Push the Ethernet cable connector into the FX5-CCLGN-MS until it clicks. Pay attention to the connector's direction.
3. Lightly pull it to check that it is securely connected.
4. Power on the FX5-CCLGN-MS and the external device.
5. Check whether the LINK LED of the port connected with an Ethernet cable is on.*¹

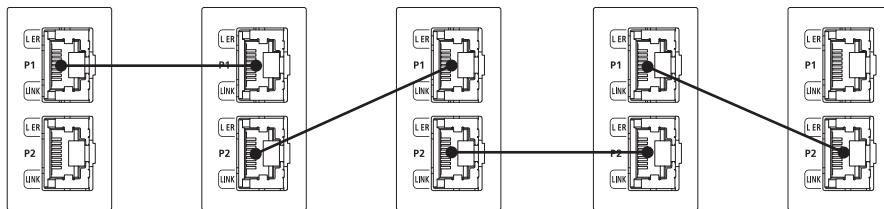
*¹ The time between the Ethernet cable connection and the LINK LED turning on may vary. The LINK LED usually turns on in a few seconds. Note, however, that the time may be extended further if the link-up processing is repeated depending on the status of the device on the line. If the LINK LED does not turn on, refer to the following and take corrective actions.

☞ Page 138 TROUBLESHOOTING



Both P1 connector and P2 connectors can be used.

- When only one of P1 and P2 connectors is used in a star topology, either P1 or P2 connector is applicable.
- When both ports are used in a line topology, P1-P1, P2-P2, and P1-P2 connections are acceptable.

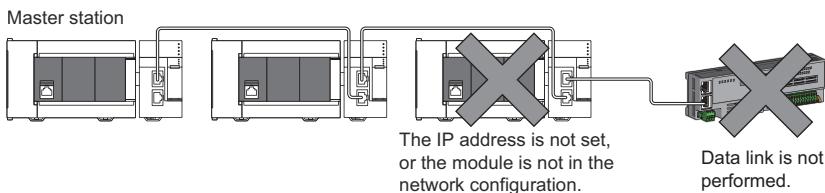


■Disconnecting the cable

1. Power off the FX5-CCLGN-MS.
2. Press the latch down and unplug the Ethernet cable.

■Precautions

- The bending radius of the Ethernet cable is limited. For details, check the specifications of the Ethernet cable to be used.
- Place the Ethernet 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 installing a cable, do not touch the 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 a data link.
- Hold the connector part when connecting and disconnecting the Ethernet cable. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- Check that the Ethernet cable is not disconnected or not shorted and there is no problem with the connector connection.
- Do not use Ethernet cables with broken latches. Doing so may cause the cable to unplug or malfunction.
- For connectors without Ethernet cables, attached caps should be mounted to prevent foreign matter such as dirt or dust.
- The maximum station-to-station distance of the Ethernet cable is 100m. However, the length may be shorter depending on the operating environment of the cable. For details, contact the manufacturer of the cable used.
- In a line topology, do not connect a slave station with no IP address setting or a slave station that is not in the master station's network configuration between the master station and slave stations, or between slave stations. A data link may not be performed between the master station and slave stations with no IP address setting or slave stations that are connected after the connection of a slave station that is not in the master station's network configuration.



- Communication with the Ethernet device may not be possible depending on the specifications of the connected Ethernet device or switching hub. If communications are not possible, reduce the communication data volume of the Ethernet device.

Wiring products

The following describes the devices used for CC-Link IE TSN.

■Ethernet cable

Use Ethernet cable that meets the following standards.

Communication speed	Ethernet cable	Connector	Type
1Gbps	Category 5e or higher, straight cable (double shielded, STP)	RJ45 connector	The following conditioning cables: <ul style="list-style-type: none">IEEE 802.3 (1000BASE-T)ANSI/TIA/EIA-568-B (Category 5e)

Cables for CC-Link IE TSN are available from Mitsubishi Electric System & Service Co., Ltd. (Catalogs for cable are also available.)

In addition, the connector processing of cable length is available for your preference. Please consult your local Mitsubishi representative.

Communication speed	Type	Model (Manufacturer)
1Gbps	Category 5e or higher, straight cable (double shielded, STP)	SC-E5EW series (Mitsubishi Electric System & Service Co., Ltd.)

Point

A communication error may occur due to high-frequency noise from devices other than a programmable controller in a given connection environment. The following describes countermeasures to be taken on the FX5-CCLGN-MS side to avoid high-frequency noise influence.

Wiring

- Use a duplex shield type cable.
- Do not bundle the cable with the main circuit or power cable or do not place it near those lines.
- Place the cable in a duct.

■Switching hub

Use the following industrial switching hubs.

Term	Description	Authentication Class
TSN switching hub	For the models and usage methods of the switching hubs, refer to the CC-Link Partner Association website (www.cc-link.org).	Authentication Class B device
General-purpose switching hub		Authentication Class A device

A switching hub can be used for cascade connection.

When the switching hub is used for cascade connection, check the specifications of the switching hub used.

Precautions

- Since there are different restrictions for system configuration using a TSN switching hub and system configuration using a general-purpose switching hub, setting with an engineering tool is required. (☞ Page 64 SYSTEM CONFIGURATION)
- Do not configure a ring topology when modules are connected to a switching hub. Doing so, all stations will fail and data links cannot be performed.

7 PARAMETER SETTINGS

This chapter describes the parameter settings required for communications between the FX5-CCLGN-MS and other stations.

7.1 Setting Parameters

1. Add the FX5-CCLGN-MS in the engineering tool.

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

2. The required settings, basic settings, and application settings are included in the parameter settings. Select one of the settings from the tree on the following window.

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ Target Module

3. After setting parameters, click the [Apply] button.

4. Write parameters to the FX5 CPU module using the engineering tool.

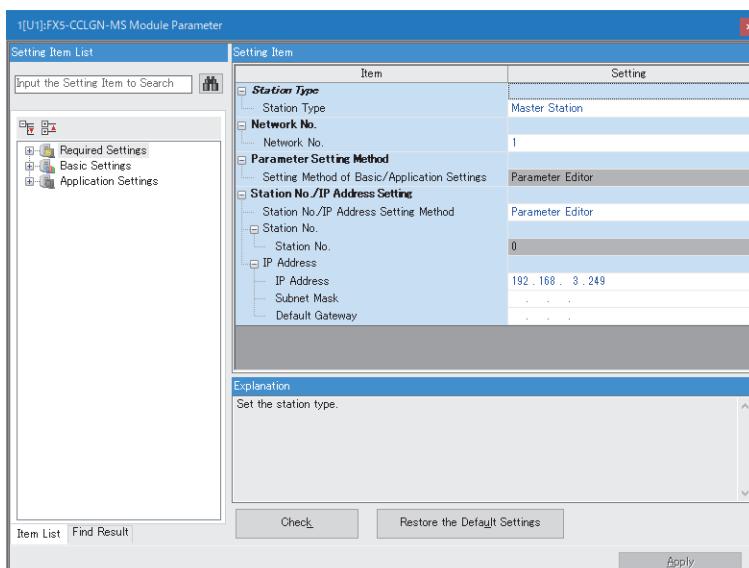
☞ [Online] ⇒ [Write to PLC]

5. The parameters are reflected by resetting the FX5 CPU module or powering off and on the system.

7.2 Required Settings

Set such items as the station type and network number of the FX5-CCLGN-MS.

7



Item	Description	Reference
Station Type	Set the station type of the FX5-CCLGN-MS.	Page 89 Station type
Network No.	Set the network number of the FX5-CCLGN-MS.	Page 90 Network No.
Parameter Setting Method	Set "Basic Settings" and "Application Settings" items using the engineering tool or in program.	Page 90 Parameter setting method
Station No./IP Address Setting	Set the station number or IP address of the FX5-CCLGN-MS.	Page 91 Station No./IP address setting

Station type

Set the station type of the FX5-CCLGN-MS.

Item	Description	Setting range
Station Type	Select whether to use the FX5-CCLGN-MS as the master station or local station. Only one master station can be set in a network.	<ul style="list-style-type: none"> • Master Station • Local Station (Default: Station type set in the "Add New Module" window.)

Network No.

Set the network number of the FX5-CCLGN-MS.

Item	Description	Setting range
Network No.	Set the network number of the FX5-CCLGN-MS.	1 to 239 (Default: 1)

Precautions

Set a network number that does not duplicate any other network numbers.

When a network number is duplicated in the same system, an error will occur in the CPU module.

In particular, when using an Ethernet-equipped module (CPU module) at default, the IP address is 192.168.3.250 and the network number is the third octet of the IP address, thus 3. Because setting the network number of the FX5-CCLGN-MS to 3 causes duplication, set another network number.

Parameter setting method

Set "Basic Settings" and "Application Settings" items using the engineering tool or in program.

Item	Description	Setting range
Setting Method of Basic/Application Settings	Select this item to set the parameter using the engineering tool. The following are advantages. <ul style="list-style-type: none">• All parameters can be easily set in the window without creating a program for setting.• Data can be automatically transferred from the link special relay (SB), link special register (SW), and link devices of the FX5-CCLGN-MS to the devices of the FX5 CPU module.	Parameter Editor (fixed)

Station number/IP address setting of a local station

The station number/IP address of a local station can be also set using the G(P).UINI instruction. This allows project data items other than the station number/IP address to be shared. (MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks))

The procedure for setting the station number of a local station is as follows.

1. Set "Station No./IP Address Setting Method" under "Station No./IP Address Setting" in "Required Settings" to "Program".
2. Set "Setting Method of Basic/Application Settings" under "Parameter Setting Method" in "Required Settings" to "Parameter Editor".
3. Set the station number using the G(P).UINI instruction.

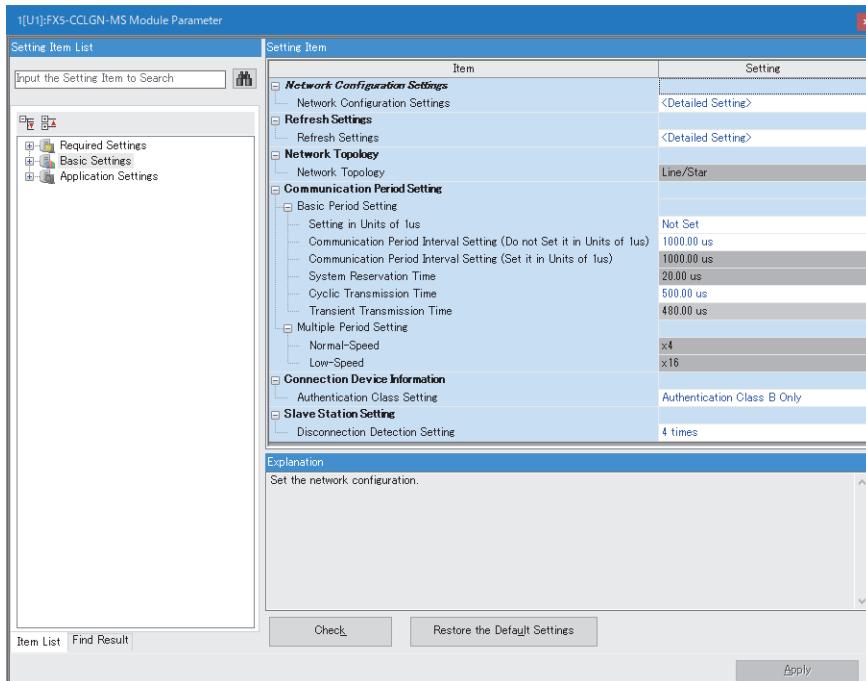
Station No./IP address setting

Set the station number and IP address of the own station of the FX5-CCLGN-MS.

Item	Description	Setting range
Station No./IP Address Setting Method	Select whether to set the station number using the engineering tool or set the station number/IP address using a program (G(P).UINI instruction). This item can be set only for a local station. When selecting "Program", use the G(P).UINI instruction to set the station number/IP address. (MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks))	<ul style="list-style-type: none"> Parameter Editor Program (Default: Parameter Editor)
Station No.	Set the station number of the FX5-CCLGN-MS. This item can be set only for a local station. To set the station number in this setting, set "Station No./IP Address Setting Method" to "Parameter Editor". Set a station number different from those used in the same network.	<ul style="list-style-type: none"> Master station: Fixed to "0" Local station: 1 to 120 (Default: 1)
IP Address	Set the IP address of the own station. Set an IP address different from those used in other stations. (Page 61 IP address duplication detection) Do not set the following values. <ul style="list-style-type: none"> The third and fourth octets are all 0 or all 1. The host address bits are all 0 or all 1. Reserved address 	0.0.0.1 to 223.255.255.254 (00.00.00.01 to DF.FF.FF.FE) (Default: Master station 192.168.3.249, local station 192.168.3.11)
Subnet Mask	Set the subnet mask. Set the same value for the master station and slave station. If the subnet mask is empty, the address class (class A, class B, class C) is determined from the setting of "IP Address", and operation is done with the subnet mask according to the address class. The subnet mask for each class is as follows. <ul style="list-style-type: none"> Class A: 255.0.0.0 Class B: 255.255.0.0 Class C: 255.255.255.0 The IP address for each class is as follows. <ul style="list-style-type: none"> Class A: 0.x.x.x to 127.x.x.x Class B: 128.x.x.x to 191.x.x.x Class C: 192.x.x.x to 223.x.x.x The host address for each class is the 0 section shown below. <ul style="list-style-type: none"> Class A: 255.0.0.0 Class B: 255.255.0.0 Class C: 255.255.255.0 	<ul style="list-style-type: none"> Empty 0.0.1 to 255.255.255.255 (00.00.00.01 to FF.FF.FF.FF) (Default: empty)
Default Gateway	Set the default gateway.	<ul style="list-style-type: none"> Empty 0.0.1 to 223.255.255.254 (00.00.00.01 to DF.FF.FF.FE) (Default: empty)

7.3 Basic Settings

Set the network configurations, refresh settings, or other parameters for the FX5-CCLGN-MS.



○: Can be set, ×: Cannot be set

Item	Description	Availability		Reference
		Master station	Local station	
Network Configuration Settings	Set parameters of slave stations (the number of points and assignment of link devices) in the master station.	○	×	Page 100 "CC-Link IE TSN Configuration" Window
Refresh Settings	Assign link refresh ranges between the following devices. • SB, SW, link devices (RX, RY, RW _r , RW _w) of the FX5-CCLGN-MS ↔ Devices of the FX5 CPU module	○	○	Page 93 Refresh settings
Network Topology	Select the network topology type according to the actual network configuration.	○	×	Page 95 Network topology
Communication Period Setting	Perform basic cycle setting and multiple cycle setting.	○	×	Page 95 Communication period setting
Connection Device Information	Set the authentication Class of connected devices.	○	×	Page 96 Connection device information
Slave Station Setting	Set the number of consecutive communication failures until a slave station is considered disconnected.	○	×	Page 96 Slave station setting

Refresh settings

Assign link refresh ranges between the following devices.

- SB, SW, link devices (RX, RY, RWr, RWw) of the FX5-CCLGN-MS ↔ Devices of the FX5 CPU module

Setting method

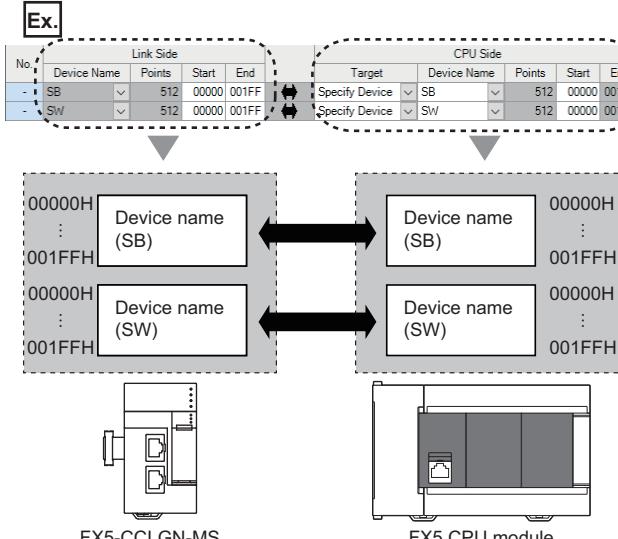
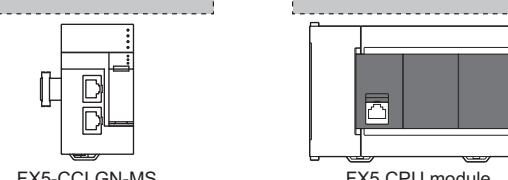
The procedure for the refresh settings is as follows.

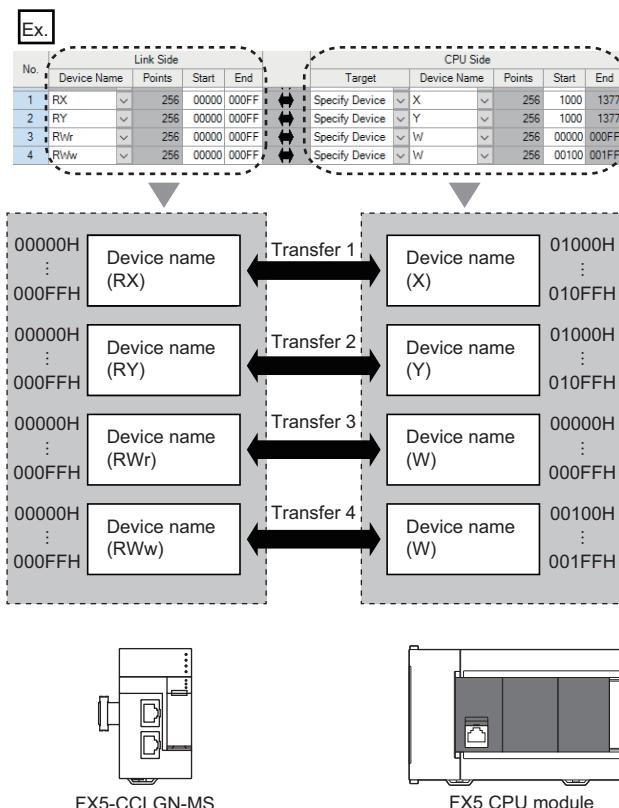
1. Set the required items.
2. Click the [Apply] button to finish "Refresh Settings".

Setting items

The setting items for the refresh settings are as follows.

No.	Link Side				Target	CPU Side				
	Device Name	Points	Start	End		Device Name	Points	Start	End	
-	SB	▼			▼	▼				
-	SW	▼			▼	▼				
1		▼			▼	▼				
2		▼			▼	▼				

Item	Description					Setting range			
	For master stations			For local stations					
Device Assignment Method	Right-click in the setting window and select a link device assignment method from the "Device Assignment Method" menu.					<ul style="list-style-type: none"> • Start/End: Enter the start and end numbers of link devices. • Points/Start: Enter the numbers of points and start numbers of link devices. 			
—	<p>Link Side</p> <p>Set the link refresh ranges of SB and SW. One link refresh range can be set for each of SB and SW. ( Page 32 Link refresh)</p> <p>Ex.</p> 					<ul style="list-style-type: none"> ■ Device Name <ul style="list-style-type: none"> • SB (fixed) • SW (fixed) ■ Points <ul style="list-style-type: none"> • SB: 16 to 4096 (set in increments of 16 points) • SW: 1 to 4096 <p>(Default: empty)</p> <ul style="list-style-type: none"> ■ Start <ul style="list-style-type: none"> • SB: 0H to FF0H (set in increments of 16 points) • SW: 0H to FFFF (set in increments of 1 point) <p>(Default: empty)</p> <ul style="list-style-type: none"> ■ End <ul style="list-style-type: none"> • SB: FH to FFFF (set in increments of 16 points) • SW: 0H to FFFF (set in increments of 1 point) <p>(Default: empty)</p>			
—	<p>CPU Side</p> 					<ul style="list-style-type: none"> ■ Target <ul style="list-style-type: none"> • Specify Device <p>(Default: empty)</p> <ul style="list-style-type: none"> ■ Device name <ul style="list-style-type: none"> • Specify Device (link side is SB): SB, M, L, B, D, R • Specify Device (link side is SW): SW, M, L, B, D, R <p>(Default: empty)</p> <ul style="list-style-type: none"> ■ Points, End <p>Displayed according to setting of "Start".</p> <p>(Default: empty)</p> <ul style="list-style-type: none"> ■ Start <p>Device range of FX5 CPU modules (Set bit devices in increments of 16 points and word devices in increments of 4 points.)</p> <p>(Default: empty)</p>			

Item	Description	Setting range																																																			
		For master stations	For local stations																																																		
1 to 256	Link Side	<p>Set the link refresh ranges of RX, RY, RWr, and RWw. A maximum of 256 points can be set for the link refresh range of each. ( Page 32 Link refresh)</p> <p>Ex.</p>  <table border="1"> <thead> <tr> <th>No.</th> <th>Device Name</th> <th>Points</th> <th>Start</th> <th>End</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RX</td> <td>256</td> <td>00000</td> <td>000FF</td> </tr> <tr> <td>2</td> <td>RY</td> <td>256</td> <td>00000</td> <td>000FF</td> </tr> <tr> <td>3</td> <td>RWr</td> <td>256</td> <td>00000</td> <td>000FF</td> </tr> <tr> <td>4</td> <td>RWw</td> <td>256</td> <td>00000</td> <td>000FF</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Target</th> <th>Device Name</th> <th>Points</th> <th>Start</th> <th>End</th> </tr> </thead> <tbody> <tr> <td>Specify Device</td> <td>X</td> <td>256</td> <td>1000</td> <td>1377</td> </tr> <tr> <td>Specify Device</td> <td>Y</td> <td>256</td> <td>1000</td> <td>1377</td> </tr> <tr> <td>Specify Device</td> <td>W</td> <td>256</td> <td>00000</td> <td>000FF</td> </tr> <tr> <td>Specify Device</td> <td>W</td> <td>256</td> <td>00100</td> <td>001FF</td> </tr> </tbody> </table>	No.	Device Name	Points	Start	End	1	RX	256	00000	000FF	2	RY	256	00000	000FF	3	RWr	256	00000	000FF	4	RWw	256	00000	000FF	Target	Device Name	Points	Start	End	Specify Device	X	256	1000	1377	Specify Device	Y	256	1000	1377	Specify Device	W	256	00000	000FF	Specify Device	W	256	00100	001FF	<p>■Device name</p> <ul style="list-style-type: none"> • RX, RY, RWr, RWw (Default: empty) <p>■Points</p> <ul style="list-style-type: none"> • RX, RY: 16 to 8192 (set in increments of 16 points) • RWr, RWw: 4 to 4096 (set in increments of 4 points) <p>(Default: empty)</p> <p>■Start</p> <ul style="list-style-type: none"> • RX, RY: 0H to 1FF0H (set in increments of 16 points) • RWr, RWw: 0 to FFCH (set in increments of 4 points) <p>(Default: empty)</p> <p>■End</p> <ul style="list-style-type: none"> • RX, RY: FH to 1FFFH (set in increments of 16 points) • RWr, RWw: 3H to FFFFH (set in increments of 4 points) <p>(Default: empty)</p> <p>■Target</p> <ul style="list-style-type: none"> • Specify Device (Default: empty) <p>■Device name</p> <ul style="list-style-type: none"> • Specify Device (link side is RX): X, M, L, B, D, W, R • Specify Device (link side is RY): Y, M, L, B, D, W, R • Specify Device (link side is RWr, RWw): M, L, B, D, W, R <p>(Default: empty)</p> <p>■Points, End</p> <p>Displayed according to setting of "Start". (Default: empty)</p> <p>■Start</p> <p>Device range of FX5 CPU modules (Set bit devices in increments of 16 points and word devices in increments of 4 points.) (Default: empty)</p>
No.	Device Name	Points	Start	End																																																	
1	RX	256	00000	000FF																																																	
2	RY	256	00000	000FF																																																	
3	RWr	256	00000	000FF																																																	
4	RWw	256	00000	000FF																																																	
Target	Device Name	Points	Start	End																																																	
Specify Device	X	256	1000	1377																																																	
Specify Device	Y	256	1000	1377																																																	
Specify Device	W	256	00000	000FF																																																	
Specify Device	W	256	00100	001FF																																																	
CPU Side																																																					

Precautions

■Device set to "CPU Side"

Set a device range not to overlap the one used for the following:

- "Refresh settings" of intelligent function modules

■Link refresh range

Set only link devices used in the FX5 CPU module for link refresh range. Doing so will reduce the number of excess points, resulting in a shorter link refresh time.

Network topology

Select the network topology type according to the actual network configuration.

Setting is not required and can be left as "Line/Star" (default).

Communication period setting

Perform basic cycle setting and multiple cycle setting.

- Basic cycle setting requires calculation of the communication cycle interval and cyclic transmission time. (☞ Page 215 Communication cycle intervals)
- Multiple cycle setting is used when communication cycles coexist. (☞ Page 40 Communication cycle coexistence)

Item	Description	Setting range
Basic Period Setting	Setting in Units of 1μs	Select whether to set the basic cycle in increments of 1μs. • Set • Do Not set (Default: Do Not set)
	Communication Period Interval Setting (Do Not Set it in Units of 1μs)	Select a communication cycle interval.
	Communication Period Interval Setting (Set it in Units of 1μs)	250.00μs to 10000.00μs (in increments of 1μs) (Default: 1000.00μs)
	System Reservation Time	20.00μs (fixed)
	Cyclic Transmission Time	5.00μs to 9966.00μs (in increments 1μs) (Default: 500.00μs)
Multiple Cycle Setting	Transient Transmission Time	14.00μs to 9975.00μs (in increments of 1μs) (Default: 480.00μs)
	Normal-Speed	Select the "Normal-Speed" cycle for a basic cycle. Setting is not required and can be left as "×4". (Default: ×4)
	Low-Speed	Select the "Low-Speed" cycle for a basic cycle. Setting is not required and can be left as "×16". (Default: ×16)

Point

When the TSN switching hub is used, set the timeslot information from the setting values in "Basic Period Setting".

The timeslot information can be checked with the buffer memory. (☞ Page 191 Timeslot information)

Connection device information

Set the information of the connected device.

Item	Description	Setting range
Authentication Class Setting	Set the authentication Class of connected devices.	<ul style="list-style-type: none">• Authentication Class B only• Mixture of Authentication Class B/A or Authentication Class A Only (Default: Authentication Class B only)

Precautions

In the case of "Authentication Class B Only" and "Mixture of Authentication Class B/A or Authentication Class A Only" system configuration, different restrictions apply. (☞ Page 64 SYSTEM CONFIGURATION)

Slave station setting

Set items related to the slave station.

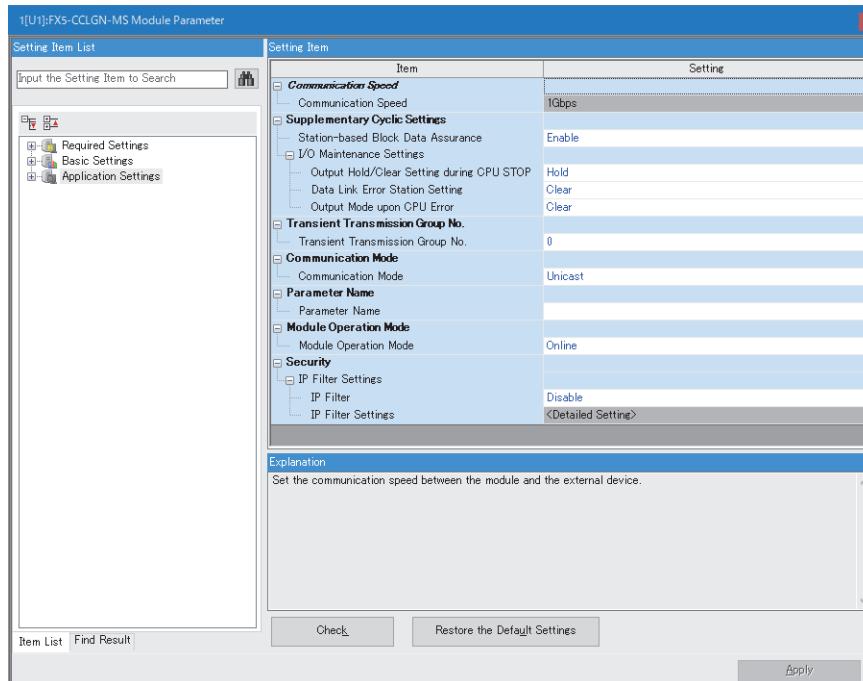
Item	Description	Setting range
Disconnection Detection Setting	Set the number of consecutive communication failures until a slave station is considered disconnected.	<ul style="list-style-type: none">• 2 times• 4 times• 8 times (Default: 4 times)

Precautions

The disconnection detection setting does not necessarily guarantee that the disconnection is performed according to the number of times set. When disconnection is detected, a bit of the disconnected station in 'Data link status of each station' (SW00B0 to SW00B7) turns on. However, the time required this may be at least four times the time required for the number of consecutive communication failures set in the disconnection detection setting.

7.4 Application Settings

Set the supplementary cyclic settings, transient transmission group number, and other settings for the FX5-CCLGN-MS.



7

Item	Description	Reference
Communication Speed	Set the communication speed.	Page 97 Communication speed
Supplementary Cyclic Settings	Set the station-based block data assurance and I/O maintenance settings.	Page 98 Supplementary cyclic settings
Transient Transmission Group No. Setting	Set the transient function.	Page 98 Transient transmission group No. setting
Communication Mode	Set the communication mode.	Page 98 Communication mode
Parameter Name	Set a name for the module parameter if desired.	Page 98 Parameter name
Module Operation Mode	Set the mode for the FX5-CCLGN-MS.	Page 99 Module operation mode
Security	Set the security measures for access to the Ethernet device.	Page 99 Security

Communication speed

Set the communication speed.

Item	Description	Setting range
Communication Speed	Select the communication speed.	1Gbps (fixed)

For details on the connection of modules or devices based on the communication speed setting, refer to the following.

☞ Page 64 SYSTEM CONFIGURATION

Supplementary cyclic settings

Set the station-based block data assurance and I/O maintenance settings.

Item	Description	Setting range
Station-based Block Data Assurance	Select whether to ensure data integrity of the data blocks being refreshed between the FX5 CPU module and the FX5-CCLGN-MS. (☞ Page 34 Cyclic data assurance)	<ul style="list-style-type: none">• Enable• Disable <p>(Default: Enable)</p>
I/O Maintenance Settings	Output Hold/Clear Setting during CPU STOP	Select whether cyclic data output is held or cleared when the FX5 CPU module mounted with the FX5-CCLGN-MS is set to the STOP state. (☞ Page 41 I/O maintenance settings)
	Data Link Error Station Setting	Select whether input data from the master station is held or cleared when a data link error occurs. (☞ Page 41 I/O maintenance settings)
	Output Mode upon CPU Error	Select whether cyclic transmission output data is held or cleared when a stop error occurs in the FX5 CPU module mounted with the FX5-CCLGN-MS. (☞ Page 41 I/O maintenance settings)

Transient transmission group No. setting

Set the transient transmission group number.

Item	Description	Setting range
Transient Transmission Group No. Setting	Set the group number to perform transient transmission using group specification.	0 to 32 (0: No group specification) (Default: 0)

Communication mode

Set the communication mode.

Item	Description	Setting range
Communication Mode	Set the communication mode.	<ul style="list-style-type: none">• Unicast• Multicast <p>(Default: Unicast)</p>

Parameter name

Set a name for the module parameter if desired.

Item	Description	Setting range
Parameter Name	Set a name for the module parameter if desired.	Up to 8 one-byte or two-byte characters (Default: empty)

Module operation mode

Set the mode for the FX5-CCLGN-MS.

For details on the module communication test mode, refer to the following.

☞ Page 143 Module communication test

Item	Description	Setting range
Module Operation Mode	<p>Online</p> <ul style="list-style-type: none"> Select this mode to connect the FX5-CCLGN-MS to the network for performing data link with other stations. <p>Offline</p> <ul style="list-style-type: none"> Select this mode to disconnect the FX5-CCLGN-MS from the network and not perform data link with other stations. <p>Module Communication Test</p> <ul style="list-style-type: none"> Select this mode to check the hardware of the FX5-CCLGN-MS. Select this mode to check the module hardware when communications are unstable. 	<ul style="list-style-type: none"> Online Offline Module Communication Test (Default: Online)

Restriction

The following functions are disabled when "Module Operation Mode" is set to "Offline" or "Module Communication Test". (☞ Page 22 FUNCTIONS)

- Cyclic transmission
- Transient transmission
- RAS
- Interrupt request to CPU module

In line topology, data link is not performed for stations connected after a station in offline mode.

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Security

Set the security measures for access to the Ethernet device.

Item	Description		Setting range
IP Filter Settings	IP Filter	Set whether to use the IP filter.	<ul style="list-style-type: none"> Do Not Use Use (Default: Do Not Use)
	IP Filter Settings	Set the IP addresses to be allowed or denied.	—

IP Filter Settings

Up to 32 IP addresses can be set as an IP address to be allowed or denied by the IP filter.

Range specification as a single setting and specification of the IP addresses to be excluded from the set range are also possible.

Item	Description	Setting range
Access from IP address below	Select whether to allow or deny the access from the specified IP addresses.	<ul style="list-style-type: none"> Allow Deny (Default: Allow)
Range Setting	Select this item when specifying the IP addresses by range.	(Default: Clear)
IP Address	Set the IP addresses to be allowed or denied. When selecting "Range Setting", enter the start IP address (left field) and end IP address (right field) of the range.	0.0.0.1 to 223.255.255.254 (Default: empty)
IP Address Excluded from Range	When selecting "Range Setting", set the IP address to be excluded from the set range. Up to 32 IP addresses can be set.	0.0.0.1 to 223.255.255.254 (Default: empty)

7.5 "CC-Link IE TSN Configuration" Window

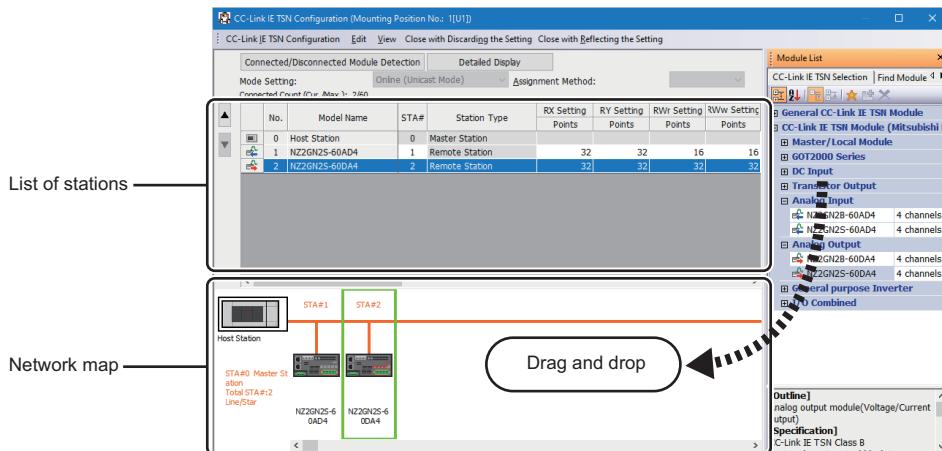
Perform the parameter setting of slave stations, the detection of connected/disconnected devices, or others.

→ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ Target module ⇒ [Module Parameter] ⇒ [Basic Settings] ⇒ [Network Configuration Settings]

Parameter setting of a slave station

Set parameters of slave stations (the number of points and assignment of link devices) in the master station.

1. Select the module in "Module List" and drag it to the list of stations or the network map.



2. Set the required items.
3. Select [Close with Reflecting the Setting] and close the "CC-Link IE TSN Configuration" window.

Setting items

- Simple Display: Click the [Simple Display] button to display a narrow portion of items. Use for operation with default settings or the minimum required settings. (Default)
- Detailed Display: Click the [Detailed display] button to display all items.

Simple display	Detailed display	Description	Setting range
—	Assignment Method	Select a link device assignment method. <ul style="list-style-type: none">• Points/Start: Enter the numbers of points and start numbers of link devices.• Start/End: Enter the start and end numbers of link devices.	<ul style="list-style-type: none">• Points/Start• Start/End <p>(Default: Points/Start)</p>
No.		The total number of slave stations set in the "CC-Link IE TSN Configuration" window is displayed.	—
Model Name		The module model name is displayed. To set a module where the profile is not registered, select it from the "General CC-Link IE TSN Module" list or register the profile before setting the model name. For how to register a profile, refer to the following. GX Works3 Operating Manual	—
STA#		Enter the station number of each slave station connected to the network. Station numbers do not need to be set consecutively, but must be unique.	<ul style="list-style-type: none">• Master station: Fixed to "0"• Slave station: 1 to 120 <p>(Default: Serial number of added stations)</p>
Station Type		Set the station types. Select the station types same as those of the modules connected to the network.	<ul style="list-style-type: none">• Master Station• Local Station• Remote Station <p>(Default: Varies depending on the set module)</p>
RX Setting		Assign RX/RY points in increments of 16. (Page 27 Communications using RX, RY, RWr, and RWw) Modules with settings provided by profile are automatically set from selected models. (Excluding modules with a number of points that is not fixed)	<ul style="list-style-type: none">• Number of points: 16 to 8192• Start: 0H to 1FF0H• End: FH to 1FFFH <p>(Default: Varies depending on the set module)</p>
RY Setting			

Simple display	Detailed display	Description	Setting range
RWw Setting		Assign RWw/RWr points in increments of 4. (☞ Page 27 Communications using RX, RY, RWr, and RWw)	<ul style="list-style-type: none"> • Number of points: 4 to 4096
RWr Setting		Modules with settings provided by profile are automatically set from selected models. (Excluding modules with a number of points that is not fixed)	<ul style="list-style-type: none"> • Start: 0H to FFCH • End: 3H to FFFF <p>(Default: Varies depending on the set module)</p>
Parameter Automatic Setting		Set whether to set the parameters of each slave station automatically. This cannot be set for extension modules. However, the parameter automatic setting of extension modules is interlocked with the settings of the connected main module.	<ul style="list-style-type: none"> • Check: Distribute parameters • Do Not check: Do not distribute parameters <p>(Default: Do Not check)</p>
IP Address		Set the IP address of a station that performs cyclic transmission.	<p>0.0.0.1 to 223.255.255.254</p> <p>(Default: The first to third octets have the same values as the master station, the fourth octet has a serial number from 1 to 254)</p>
Subnet Mask		<p>Set a subnet mask to identify a network address.</p> <p>Set the same value for the master station and slave station. Even if a slave station has a different subnet mask from the master station, it does not result in an input error.</p> <p>If 255.255.255.255 is set, leave it empty.</p>	<ul style="list-style-type: none"> • 0.0.0.1 to 255.255.255.255 • Empty <p>(Default: The same value if there is a master station)</p>
Default Gateway		Set the default gateway address to connect to the external network.	<ul style="list-style-type: none"> • 0.0.0.1 to 223.255.255.254 • Empty <p>(Default: empty)</p>
Reserved/Error Invalid Station		Set the slave station as a reserved station or error invalid station. <ul style="list-style-type: none"> • No Setting: The slave station is connected to the network. • Reserved Station: The slave station is reserved for future expansion. By using a reserved station, link device assignment will not change even if the slave station is added (reservation is canceled). Therefore, modification of the program is not required. Physical connection of the slave station on the network is not required. • Error Invalid Station: Even if a slave station is disconnected during data link, the master station will not detect the slave station as a faulty station. 	<ul style="list-style-type: none"> • No Setting • Reserved Station • Error Invalid Station <p>(Default: No setting, master station is fixed as empty)</p>
Communication Period Setting		When multiple communication cycles are set, set the cycle of each slave station. (☞ Page 40 Communication cycle coexistence)	<ul style="list-style-type: none"> • Basic Period • Normal-Speed • Low-Speed <p>(Default: Basic cycle, master station is fixed as empty)</p>
Station Information	■Alias	Enter the name of a device if required. The name entered is displayed in "Network Status" of the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window. For the extension module of the remote station, the name is not displayed in the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window, even if entered.	Up to 32 one-byte characters (one-byte or two-byte) (Default: empty)
	■Comment	Information entered in "Comment1" on the "Properties" window displayed by right-clicking the module in the list of stations or the network map is displayed.	Up to 32 one-byte characters (one-byte or two-byte) (Default: empty)
	■Station-specific mode setting	Set the station-specific mode of the slave station. (Only when the slave station supports the station-specific mode)	The setting varies depending on the set module.



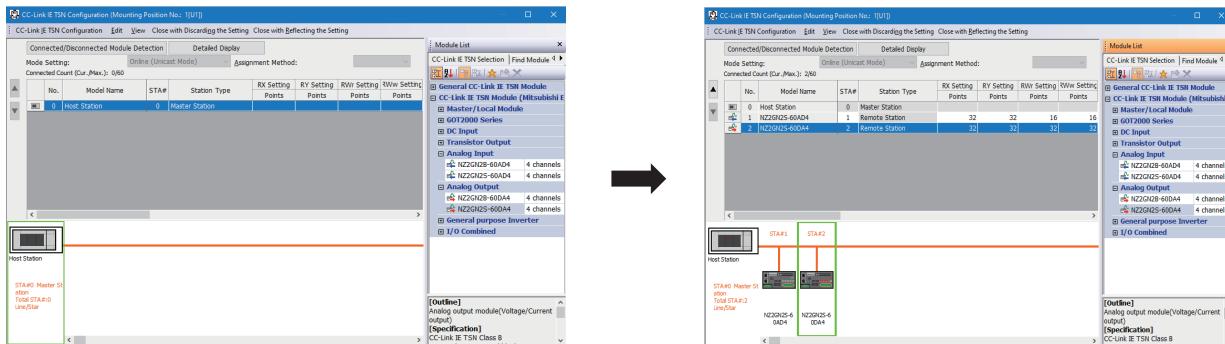
Because a portion of the setting items are not displayed in simple display, when there are deficiencies in setting items that are not displayed, the "Output" window may display a warning or error by selecting [Close with Reflecting the Setting].

If a warning is displayed, switch to detailed display and correct the items.

Connected/Disconnected module detection

Connected slave stations are detected and displayed on the "CC-Link IE TSN Configuration" window.

1. Click the [Connected/Disconnected Module Detection] button.
2. When the [Execute] button is clicked according to the instruction on the window, connected slave stations are detected and displayed on the "CC-Link IE TSN Configuration" window.



3. Check items in the list of stations and change them as necessary. ([Page 100 Setting items](#))
4. Select [Close with Reflecting the Setting] and close the "CC-Link IE TSN Configuration" window.



Detection of connected/disconnected devices cannot be executed in the following cases.

- The FX5-CCLGN-MS is not in online mode. ([Page 99 Module operation mode](#))
- The actual system configuration is incorrect. (Such as IP address duplication)
- The master station does not perform data link.

Connection/Disconnection/Replacement

When the [Connected/Disconnected Module Detection] button is clicked while the saved CC-Link IE TSN configuration is displayed, IP addresses of detected slave stations are compared with the saved IP addresses of slave stations and displayed as follows by connection/disconnection/replacement.

IP address verification result	Operation	Display	When station numbers of detected slave stations are not set
Detected slave stations are in the saved CC-Link IE TSN structure.	Replace	<p>When parameters between a detected slave station and a saved CC-Link IE TSN structure mismatch, the parameters are replaced with the parameters of the detected slave station.</p> <p>When the model name, model version, and station type are mismatched, the following settings are inherited.</p> <ul style="list-style-type: none"> • "RX Setting", "RY Setting", "RWr Setting", "RWw Setting" • "IP Address" of the master station • "Subnet Mask" • "Default Gateway" • "Reserved/Error Invalid Station" (however, if "Reserved Station" is set, the setting will change to the default.) • "Network Synchronous Communication" • "Communication Period Setting" <p>If only the station number is mismatched, only the station number is reflected, and all the settings are inherited.</p> <p>(However, if the station number of the detected device has not been set, the station number of the device before replacement is inherited.)</p>	The station number takes over the station number of the saved CC-Link IE TSN structure.
Slave stations in the saved CC-Link IE TSN structure are not detected.	Disconnect	<ul style="list-style-type: none"> • Modules other than extension modules: Setting of "Reserved/Error Invalid Station" is changed to "Reserved Station". • Extension modules: Are deleted. 	—

IP address verification result	Operation	Display	When station numbers of detected slave stations are not set
Detected slave stations are not in the saved CC-Link IE TSN structure.	Connect	<p>Detected slave stations are added. (Settings other than "IP Address", "STA#", and "Station Type" are default)</p> <p>When adding a device, the defaults other than IP address, station number, and station type are set.</p> <p>(However, if the station number of the detected device has not been set, the station number is also set to the default.)</p> <p>Added slave stations are displayed in the list of stations in the following order.</p> <ul style="list-style-type: none"> • Modules other than extension modules: In the order of IP addresses, following disconnected slave stations. • Extension modules: In the order of sub-IDs, following connected main modules and extension modules. 	<p>A station number is automatically numbered as the lowest unused station number in the range from 1 to 120.</p> <p>The order of automatic numbering is the same as the displayed order in the list of stations (see left).</p>

Precautions

In the CC-Link IE TSN structure, when a station number is set to a slave station and parameters are written to the FX5 CPU module, the station number of the slave station is held in the master station. When parameters are not to be written in FX5 CPU modules, they are saved in the CC-Link IE TSN structure as slave stations with the station number not set.



Register the profile of the target device to detect in advance.

If the profile is not registered, the following may be displayed.

- "Model Name" is "General Remote Station", "General Local Station", or "General Extension Module".
- "Station Type" is "Remote Station", "Local Station", or "Extension Module".

For how to register a profile, refer to the following.

GX Works3 Operating Manual

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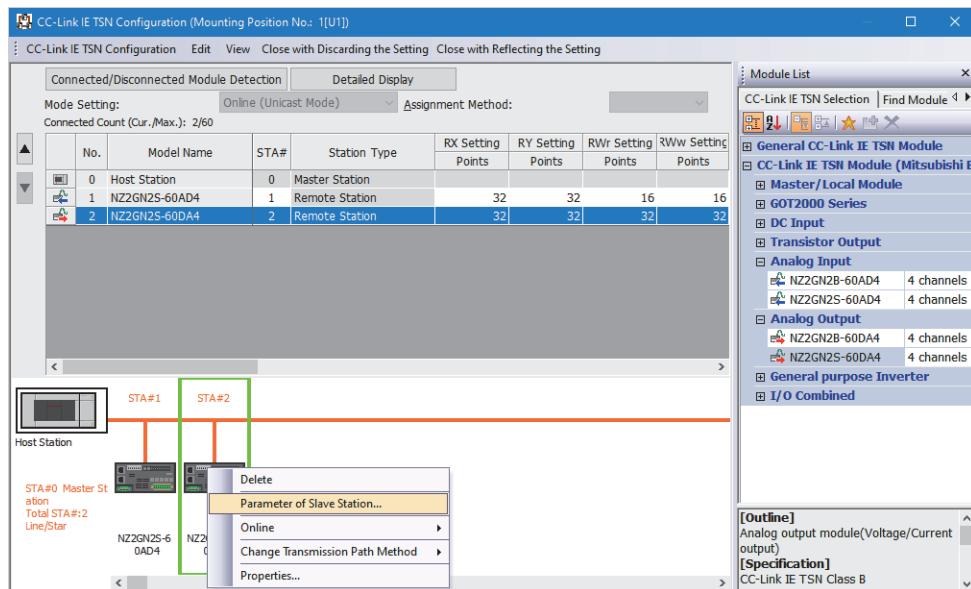
- Even when the profile is registered, if modules that are not available for detection of connected/disconnected devices are used, "Model Name" and "Station Type" are not displayed correctly.
- This function is not available for local stations.
- Reserved stations or data link faulty stations cannot be detected by this function.
- If this function is executed when the slave station has been disconnected after the master station was powered on, the setting of "Reserved Station/Error Invalid Station" does not change to "Reserved Station", but it becomes "No Setting".
- A module that cannot be used with FX5-CCLGN-MS, for example, a module with a safety communication function or a module that requires a CANopen profile, may be detected.

Parameter processing of a slave station

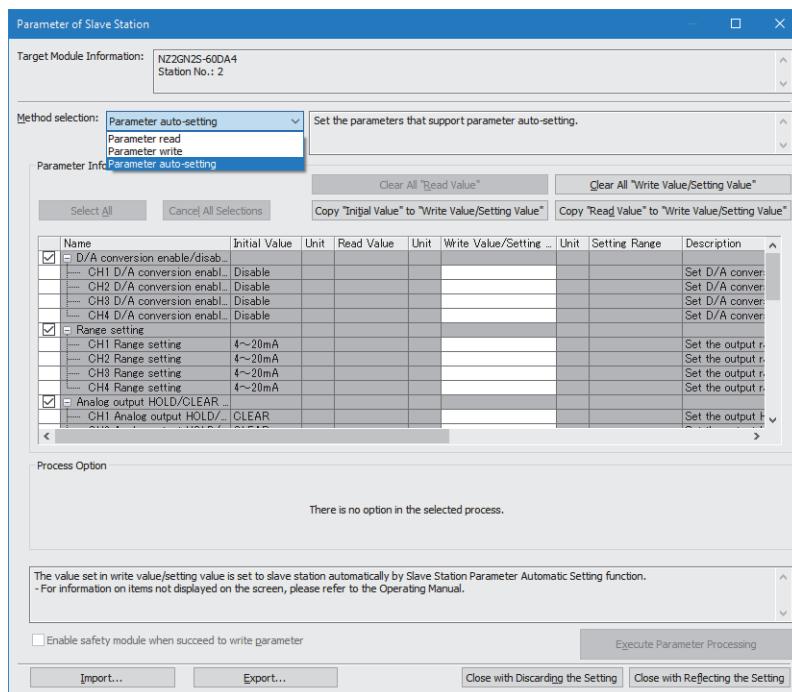
The processing is to read and save the parameters from the slave station, and to write the saved parameters to the slave station.

Also, it automatically sets parameters of the slave station from the master station. (☞ Page 63 Slave station parameter automatic setting)

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ Target module ⇒ [Basic Settings] ⇒ [Network Configuration Settings]



Select and right-click the slave station, and select "Parameter of Slave Station" to display the "Parameter of Slave Station" window.



Item		Description
Target Module Information		Information for the selected slave stations is displayed.
Method selection		Select processing to be executed for selected slave stations. <ul style="list-style-type: none"> Parameter auto-setting: Automatically set contents of "Write Value/Setting Value" to the slave station. (Page 63 Slave station parameter automatic setting) Parameter read: Read parameters from the selected slave station. Parameter write: Write parameters to the selected slave station.
Parameter Information	[Clear All "Read Value"] button	Click to clear all setting details that were read using "Parameter read".
	[Clear All "Write Value/Setting Value"] button	Click to clear all setting details that are written using "Parameter write".
Processing option		When there are options for processing selected by "Method Selection", setting items are displayed.
[Import] button		Read contents of parameter processing created in a CSV file.
[Export] button		Output contents of parameter processing set in this window to a CSV file.

Procedure for clearing a saved parameter

When returning the saved parameters of a not-required slave station to the not-set status, perform the following procedure.

1. If the saved parameters are to be saved, output them in a CSV file using the [Export] button.
2. Delete not-required slave stations from the list of stations.
3. Select the same module as the deleted slave station in "Module List", and drag it to the list of stations or the network map.

Conditions for clearing a saved parameter

Saved parameters of a slave station can be cleared under the following conditions.

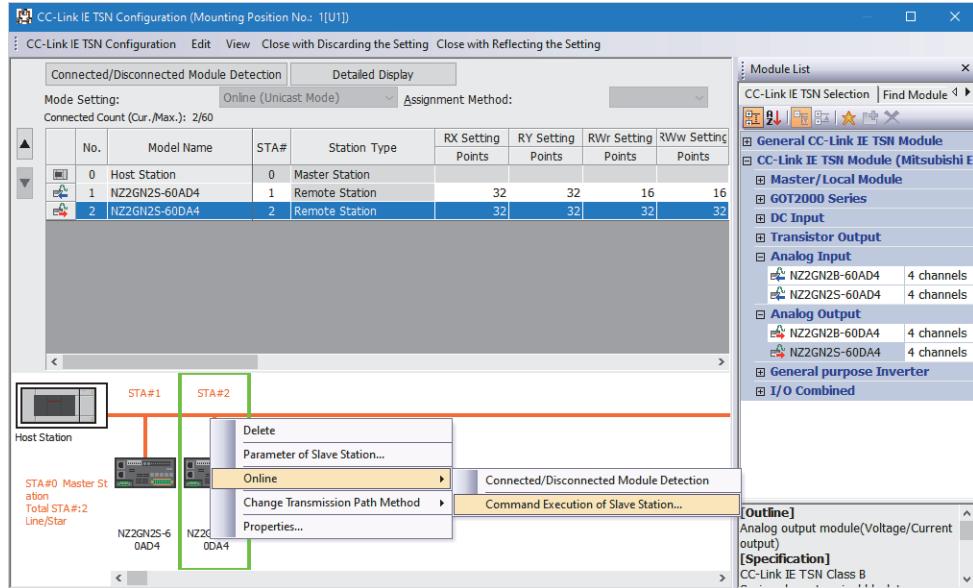
When saved parameters are cleared, execute "Parameter auto-setting" or "Parameter read" in the "Parameter of Slave Station" window and read the parameters of the slave station.

Item	Operation	Description
"CC-Link IE TSN Configuration" window	Open the "CC-Link IE TSN Configuration" window.	When there is not a slave station with the station number that matches saved parameters in the "CC-Link IE TSN Configuration" window, saved parameters of the relevant slave station are skipped. Skipped parameters of the slave station are cleared.
	Reflect setting and close the window.	Saved parameters of a slave station that is not in the actual system configuration are cleared.
	Execute detection of connected/disconnected devices.	All saved parameters are cleared.
	Change the function version in the "Properties" window.	When the "Properties" window is closed, saved parameters are cleared.
"Parameter of Slave Station" window	Open the "Parameter of Slave Station" window.	Saved parameters that mismatch the relevant slave station are skipped. Clicking the [Close with Reflecting the Setting] button in the above state clears the skipped saved parameters.
Module Parameter	Manually delete "Network Configuration Settings" to apply.	Parameters of "Network Configuration Settings" return to default.
	Change the "Setting Method of Basic/Application Settings" under "Parameter Setting Method" in "Required Settings" from "Parameter Editor" to "Program".	
	Change "Station Type" or set parameters that do not exist.	
System Parameter	Divert system parameters from another project.	Parameters of the slave station are not diverted.
Module Configuration	Delete a module and check.	Parameters are deleted together with the module.
Navigation window	Delete a module.	
Read from PLC	Read module parameters that have a different network configuration and the same Intelligent module No.	Parameters are overwritten.
Navigation window	Import the data of a simple motion module to take network settings.	
MELSOFT Navigator	Reflect the parameter.	Saved parameters are cleared.

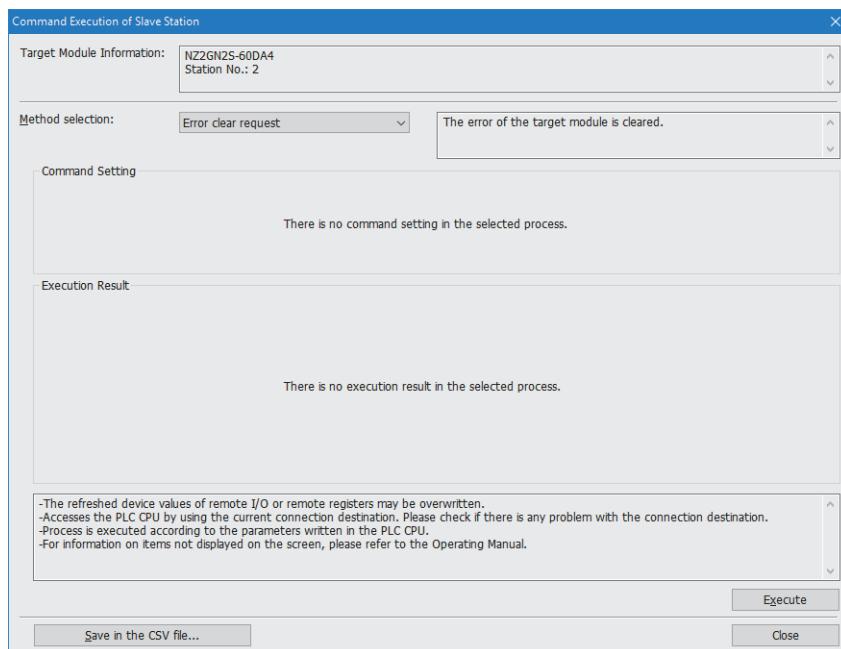
Command execution to slave stations

Commands to a slave station (Error clear request, Error history clear request) are executed.

⇨ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Basic Settings] ⇨ [Network Configuration Settings]



Select and right-click the slave station, select "Command Execution of Slave Station" from "Online" to display the "Command Execution of Slave Station" window.



Item	Description
Target Module Information	Information for the selected slave stations is displayed.
Method selection	Select processing to be executed for selected slave stations. <ul style="list-style-type: none"> Error clear request Error history clear request
Command setting	When there are command settings for processing selected by "Method selection", setting items are displayed.
Execution Result	Execution results of the processing selected in "Method selection" are displayed.
[Save in the CSV file...] button	Outputs the contents of this window to a CSV file.

8 DEDICATED INSTRUCTION

This chapter describes the transmission ranges and dedicated instructions that can be used in the FX5-CCLGN-MS.

Point

For details on dedicated instructions, refer to the following.

 MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks)

Link dedicated instructions

The following table lists the instructions used for transient transmission to or from programmable controllers on other stations.

■Instruction list

Instruction	Description
GP.READ	Reads the data from devices in the programmable controller of another station.
GP.SREAD	Reads the data from devices in the programmable controller of another station. For the GP.SREAD instruction, when the reading of the data is completed, another station's devices are turned on. Other stations can recognize that the data was read by GP.SREAD.
GP.WRITE	Writes the data to devices in the programmable controller of another station.
GP.SWRITE	Writes the data to devices in the programmable controller of another station. For the GP.SWRITE instruction, when the writing of the data is completed, another station's devices are turned on. Other stations can recognize that the data was written by GP.SWRITE.
GP.SEND	Sends data to the programmable controller of another station.
GP.RECV	Reads the data received from the programmable controller of another station.

■Transient transmission ranges

In a single network system, communication with all stations on the network is possible.

8

Other dedicated instructions

Set the parameter in the FX5-CCLGN-MS.

■Instruction list

Instruction	Description
G(P).UINI	Sets the station number and IP address in the FX5-CCLGN-MS.

8.1 Precautions for Dedicated Instructions

This section describes precautions when using dedicated instructions.

Precautions for dedicated instructions (common)

■When changing data specified by dedicated instructions

Do not change any data (such as control data) until execution of the dedicated instruction is completed.

■When the dedicated instruction is not completed

Check whether the mode of the FX5-CCLGN-MS is set to online.

A dedicated instruction cannot be executed when the mode is offline or module communication test.

Precautions for link dedicated instructions

The following describes precautions when executing multiple link dedicated instructions simultaneously.

■Channel of the link dedicated instructions

When executing multiple link dedicated instructions simultaneously, check that the channels for the instructions are not duplicated. Link dedicated instructions with the same channel number cannot be executed simultaneously. To use the same channel for multiple link dedicated instructions, configure an interlock so that an instruction is executed after completion of another.

■When link dedicated instructions are executed simultaneously

When link dedicated instructions are executed simultaneously, the subsequently requested instruction is skipped. When the instruction is skipped, the dedicated instruction skip flag (SM699) turns on.

9 PROGRAMMING

This chapter describes programming and startup examples of CC-Link IE TSN.

9.1 Precautions for Programming

This section describes precautions to create CC-Link IE TSN programs.

Cyclic transmission program

For a cyclic transmission program, configure an interlock with the following module labels (link special relay (SB), link special register (SW)).

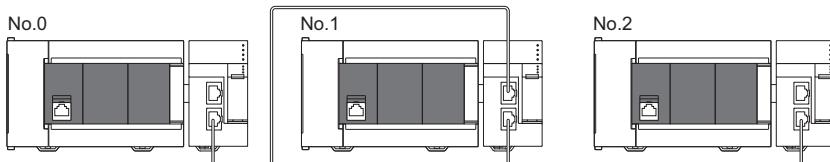
- 'Data link error status of own station' (SB0049)
- 'Data link status of each station' (SW00B0 to SW00B7)

9.2 Communication Example between the Master Station and Local station

The following system configuration is used to explain communication between the master station and local station.

System configuration

- CPU module: FX5 CPU module
- Master/local module: FX5-CCLGN-MS (Intelligent module No.: 0000H to 001FH)



No.0: Master station (station No.0)
No.1: Local station (station No.1)
No.2: Local station (station No.2)

Link device assignment

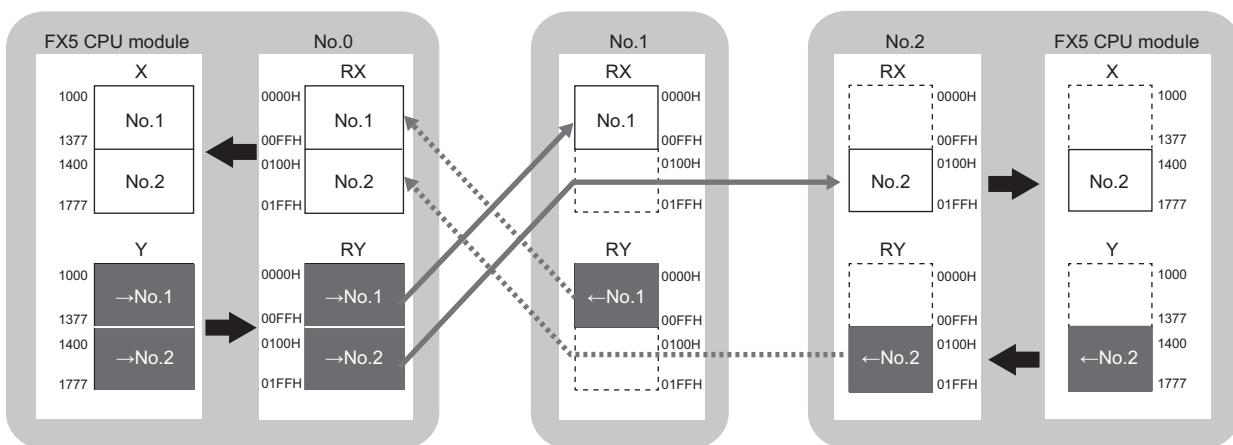
For RX, RY, RWr, and RWw, 256 points are assigned to each station.

Unicast mode

■RX/RY assignment

Each of the following No.0 to No.2 represents a station number.

No.0 is master station, and No.1 and No.2 are local stations.

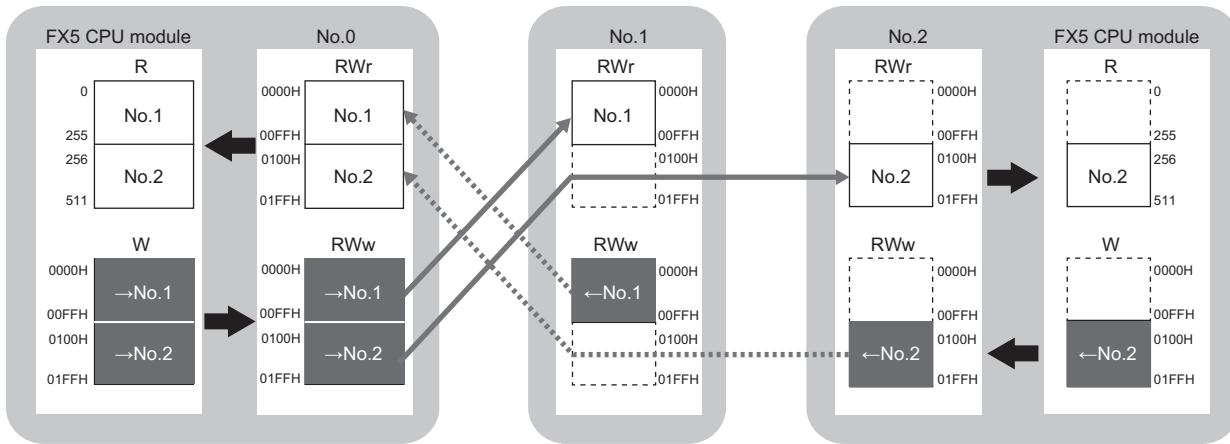


→No.1, →No.2: Send range: to station No.1, send range: to station No.2
←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

■RW_r/RW_w assignment

Each of the following No.0 to No.2 represents a station number.

No.0 is master station, and No.1 and No.2 are local stations.



→No.1, →No.2: Send range: to station No.1, send range: to station No.2

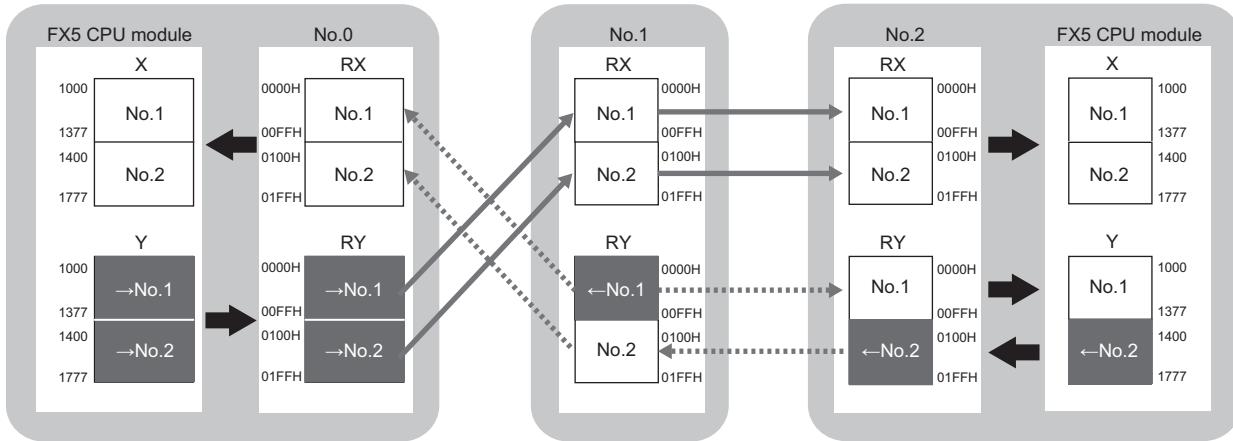
←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

Multicast mode

■RX/RY assignment

Each of the following No.0 to No.2 represents a station number.

No.0 is master station, and No.1 and No.2 are local stations.



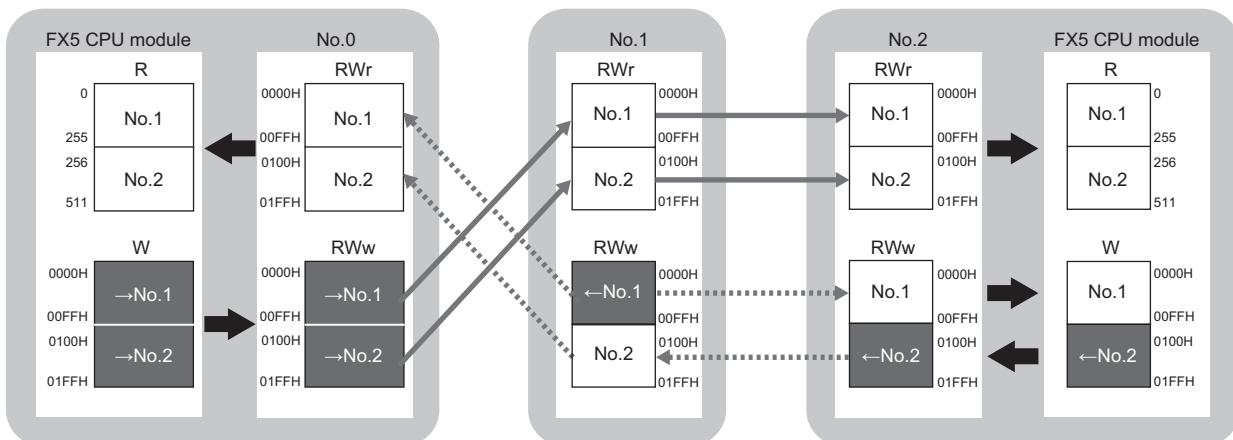
→No.1, →No.2: Send range: to station No.1, send range: to station No.2

←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

■RW_r/RW_w assignment

Each of the following No.0 to No.2 represents a station number.

No.0 is master station, and No.1 and No.2 are local stations.



→No.1, →No.2: Send range: to station No.1, send range: to station No.2

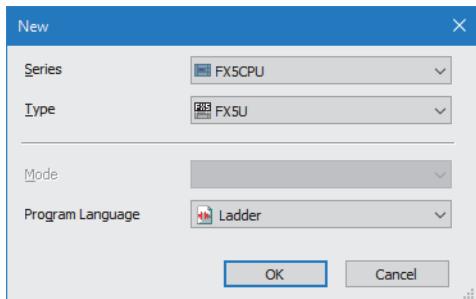
←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

Setting in the master station

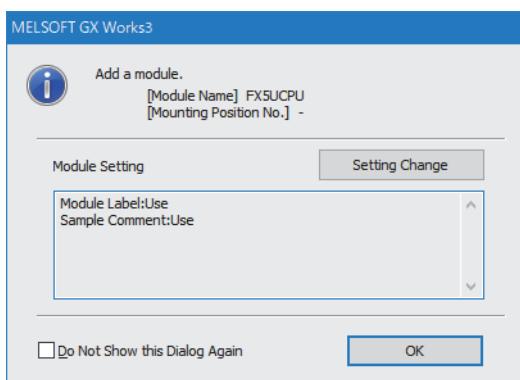
Connect the engineering tool to the FX5 CPU module on the master station and set the parameters.

1. Set the FX5 CPU module as follows.

 [Project] \Rightarrow [New]

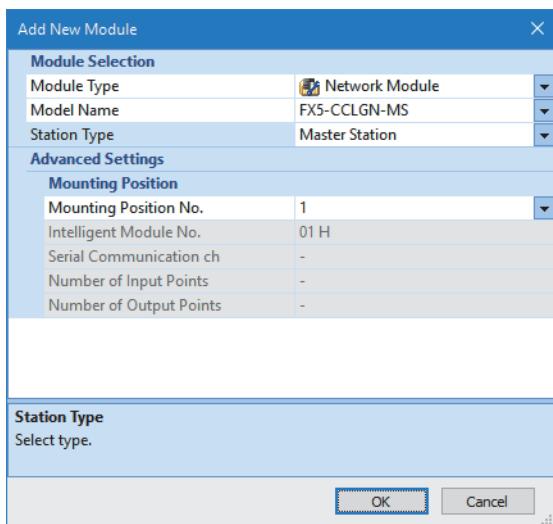


2. Click the [Setting Change] button to use the module label.

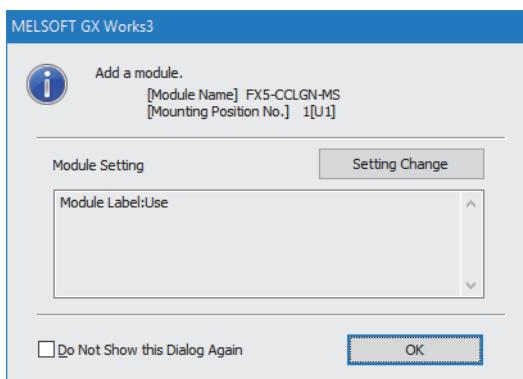


3. Set the FX5-CCLGN-MS as follows.

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



4. Click the [OK] button to add a module label of the FX5-CCLGN-MS.



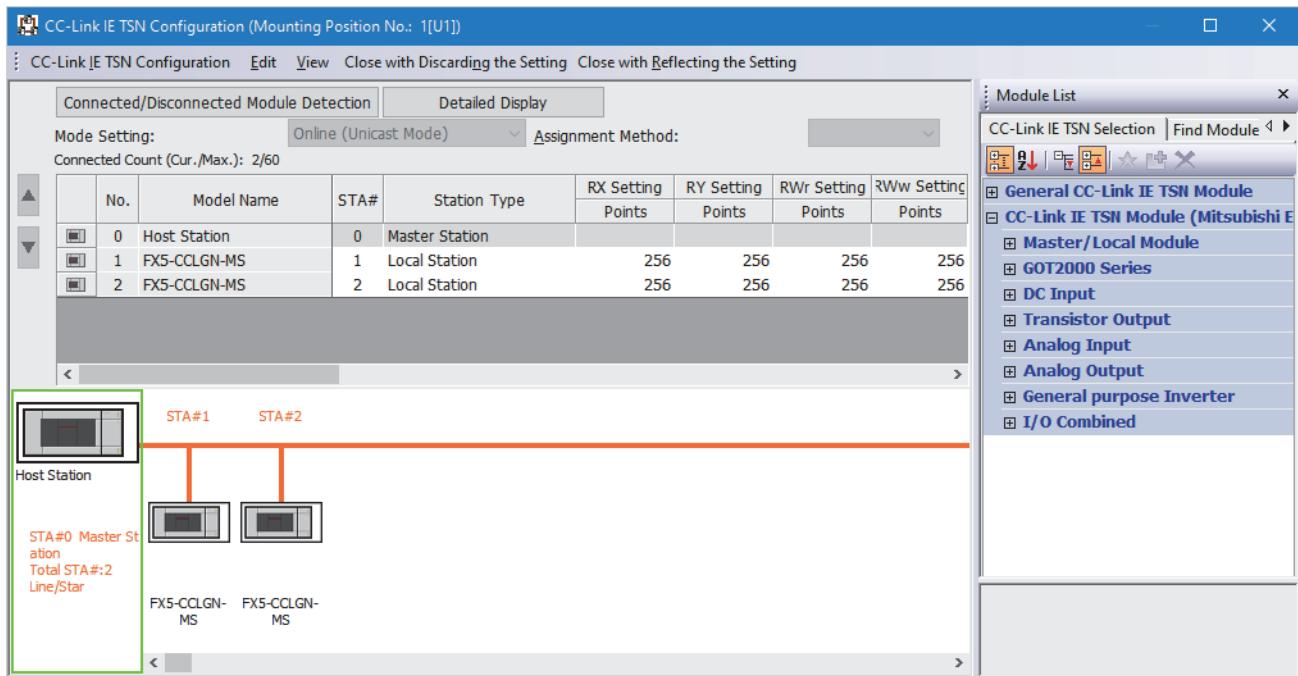
5. Set the items in "Required Settings" as follows.

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Required Settings]

Setting Item	
Item	Setting
Station Type	Master Station
Network No.	1
Parameter Setting Method	Parameter Editor
Station No./IP Address Setting	Parameter Editor
Station No.	0
IP Address	192.168.3.249
Subnet Mask	
Default Gateway	

6. Set the network configuration as follows. (Set the IP address for each station.)

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Basic Settings] ⇒ [Network Configuration Settings]



7. Click the [Close with Reflecting the Setting] button to close the "CC-Link IE TSN Configuration" window.

8. Set the refresh settings as follows.

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Basic Settings] ⇒ [Refresh Settings]

No.	Link Side					CPU Side					
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
-	SB	▼			◀▶	▼					
-	SW	▼			◀▶	▼					
1	RX	▼	512	00000	001FF	◀▶	Specify Device	▼	X	▼	512 1000 1777
2	RY	▼	512	00000	001FF	◀▶	Specify Device	▼	Y	▼	512 1000 1777
3	Rlw	▼	512	00000	001FF	◀▶	Specify Device	▼	W	▼	512 00000 001FF
4	Rwr	▼	512	00000	001FF	◀▶	Specify Device	▼	R	▼	512 0 511

9. In "Communication Mode" under "Application Settings", set "Unicast" or "Multicast".

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Application Settings] ⇒ [Communication Mode]

10. Click the [Apply] button.

11. Write the set parameters to the FX5 CPU module on the master station. Then, reset the FX5 CPU module or power off and on the system.

☞ [Online] ⇒ [Write to PLC]



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

☞ Page 89 PARAMETER SETTINGS

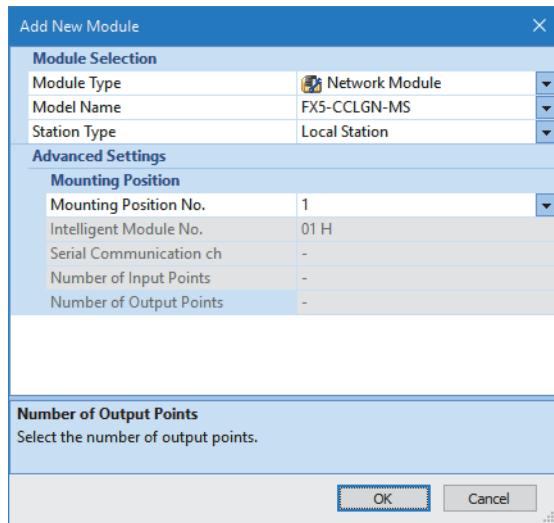
Settings in the local stations

Connect the engineering tool to the FX5 CPU module on the local station and set parameters. Set the same setting for station No.1 and station No.2.

1. Set the FX5 CPU module and add the module labels of the FX5 CPU module. The setting method of the FX5 CPU module and addition method of the module label are the same as those of the master station. (☞ Page 128 Setting in the master station)

2. Set the FX5-CCLGN-MS as follows.

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



3. Add the module labels of the FX5-CCLGN-MS. The addition method of the module label is the same as that of the master station. (☞ Page 128 Setting in the master station)

4. Set the items in "Required Settings" as follows.

☞ [Navigation window] ⇄ [Parameter] ⇄ [Module Information] ⇄ [FX5-CCLGN-MS] ⇄ [Required Settings]
 • For station No.1

Setting Item	
Item	Setting
Station Type	Local Station
Network No.	1
Parameter Setting Method	Parameter Editor
Station No./IP Address Setting	Parameter Editor
Station No.	1
IP Address	192.168.3.1

• For station No.2

Setting Item	
Item	Setting
Station Type	Local Station
Network No.	1
Parameter Setting Method	Parameter Editor
Station No./IP Address Setting	Parameter Editor
Station No.	2
IP Address	192.168.3.2

5. Set the refresh settings as follows. Set the local stations with station No.1 and station No.2 to the same refresh settings.

☞ [Navigation window] ⇄ [Parameter] ⇄ [Module Information] ⇄ [FX5-CCLGN-MS] ⇄ [Basic Settings] ⇄ [Refresh Settings]

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB									
-	SW									
1	RX	512	00000	001FF	Specify Device	X	512	1000	1777	
2	RY	512	00000	001FF	Specify Device	Y	512	1000	1777	
3	Rlw	512	00000	001FF	Specify Device	lw	512	00000	001FF	
4	Rwr	512	00000	001FF	Specify Device	R	512	0	511	

6. Click the [Apply] button.

7. Write the set parameters to the FX5 CPU module on the local station. Then, reset the FX5 CPU module or power off and on the system.

☞ [Online] ⇄ [Write to PLC]



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

☞ Page 89 PARAMETER SETTINGS

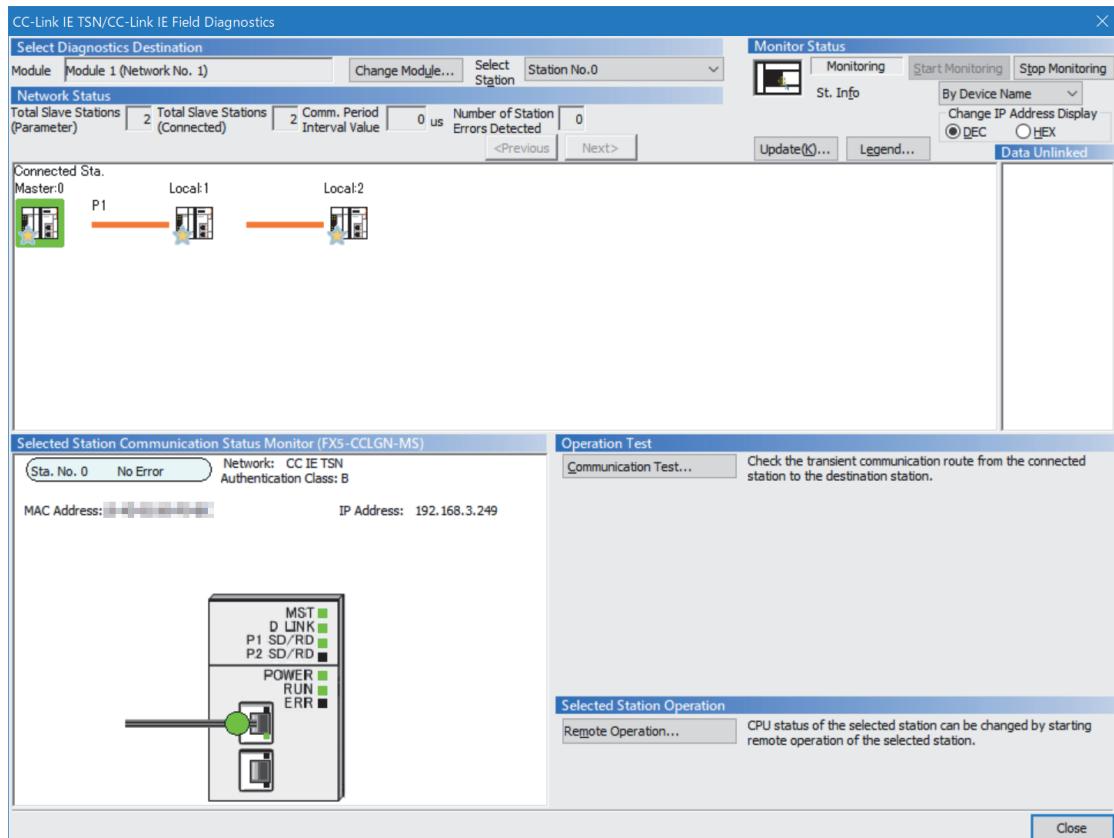
Checking the network status

Once parameters are set for the master station and local station, check whether data links between the master station and local station is normally operating. For the check, use the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool.

1. Connect the engineering tool to the FX5 CPU module on the master station.
2. Start the CC-Link IE TSN/CC-Link IE Field diagnostics.

☞ [Diagnostics] ⇒ [CC-Link IE TSN/CC-Link IE Field Diagnostics]

If the following display appears, a data link is normal.



If an error icon appears in "Network Status" area, use the CC-Link IE TSN/CC-Link IE Field diagnostics to identify the cause of the error and take corrective actions. (☞ Page 144 Checking the Network Status)

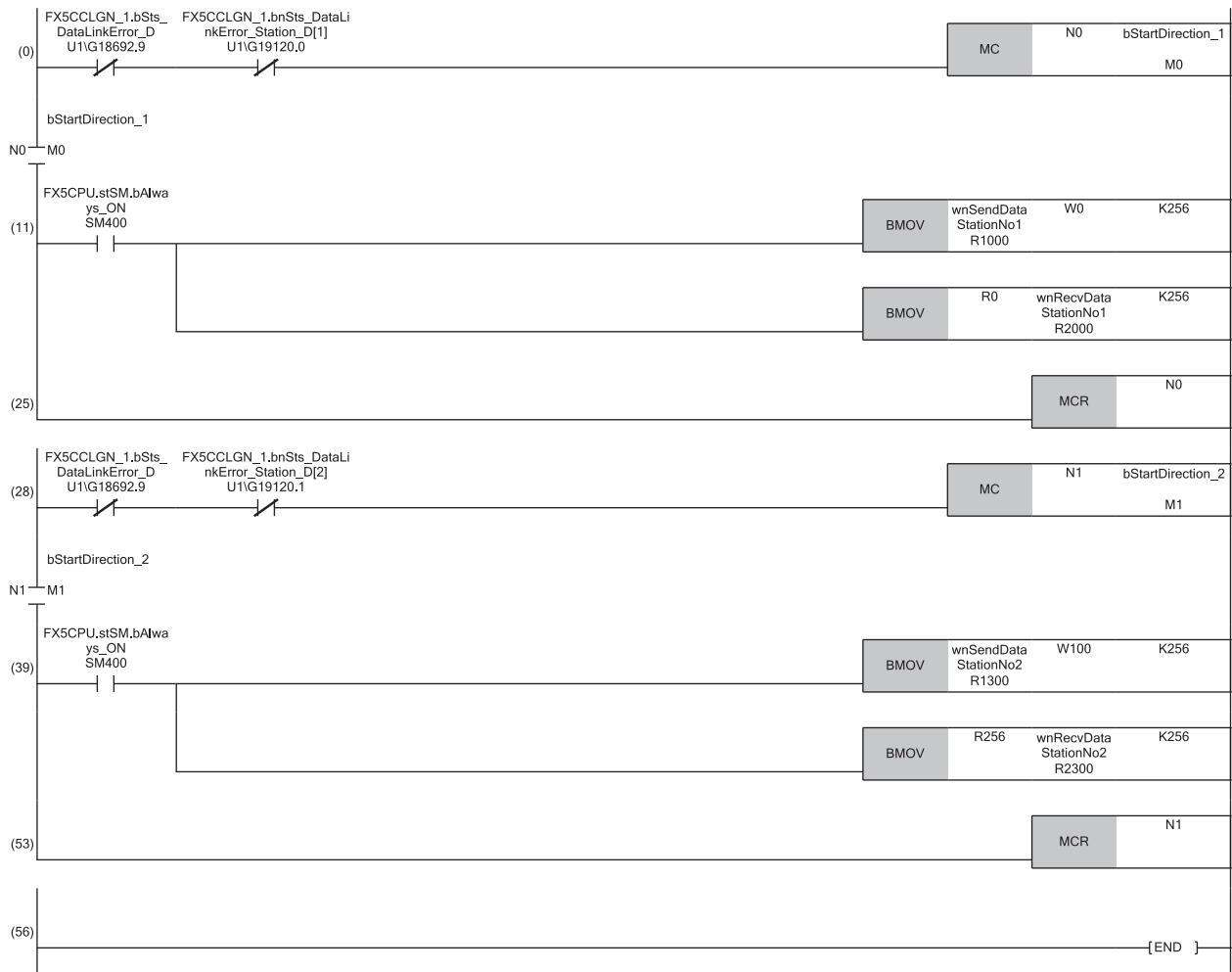
Program example (At unicast mode)

This section describes a program example when "Communication Mode" under "Application Settings" is set to "Unicast".

Master station (station No.0)

Classification	Label name	Description	Device																																			
Module label	FX5CCLGN_1.bSts_DataLinkError_D	Data link error status of own station	SB0049																																			
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[1]	Data link status of each station (station No.1)	SW00B0.0																																			
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[2]	Data link status of each station (station No.2)	SW00B0.1																																			
Label to be defined	Define global labels as shown below:																																					
	<table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection_1</td> <td>Bit</td> <td>VAR_GLOBAL</td> <td>M0</td> </tr> <tr> <td>2</td> <td>bStartDirection_2</td> <td>Bit</td> <td>VAR_GLOBAL</td> <td>M1</td> </tr> <tr> <td>3</td> <td>wnSendDataStationNo1</td> <td>Word [Signed]</td> <td>VAR_GLOBAL</td> <td>R1000</td> </tr> <tr> <td>4</td> <td>wnRecvDataStationNo1</td> <td>Word [Signed]</td> <td>VAR_GLOBAL</td> <td>R2000</td> </tr> <tr> <td>5</td> <td>wnSendDataStationNo2</td> <td>Word [Signed]</td> <td>VAR_GLOBAL</td> <td>R1300</td> </tr> <tr> <td>6</td> <td>wnRecvDataStationNo2</td> <td>Word [Signed]</td> <td>VAR_GLOBAL</td> <td>R2300</td> </tr> </tbody> </table>				Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection_1	Bit	VAR_GLOBAL	M0	2	bStartDirection_2	Bit	VAR_GLOBAL	M1	3	wnSendDataStationNo1	Word [Signed]	VAR_GLOBAL	R1000	4	wnRecvDataStationNo1	Word [Signed]	VAR_GLOBAL	R2000	5	wnSendDataStationNo2	Word [Signed]	VAR_GLOBAL	R1300	6	wnRecvDataStationNo2	Word [Signed]	VAR_GLOBAL	R2300
	Label Name	Data Type	Class	Assign (Device/Label)																																		
1	bStartDirection_1	Bit	VAR_GLOBAL	M0																																		
2	bStartDirection_2	Bit	VAR_GLOBAL	M1																																		
3	wnSendDataStationNo1	Word [Signed]	VAR_GLOBAL	R1000																																		
4	wnRecvDataStationNo1	Word [Signed]	VAR_GLOBAL	R2000																																		
5	wnSendDataStationNo2	Word [Signed]	VAR_GLOBAL	R1300																																		
6	wnRecvDataStationNo2	Word [Signed]	VAR_GLOBAL	R2300																																		

■Master station (station No.0)



(11) Communication program with the local station (station No.1)

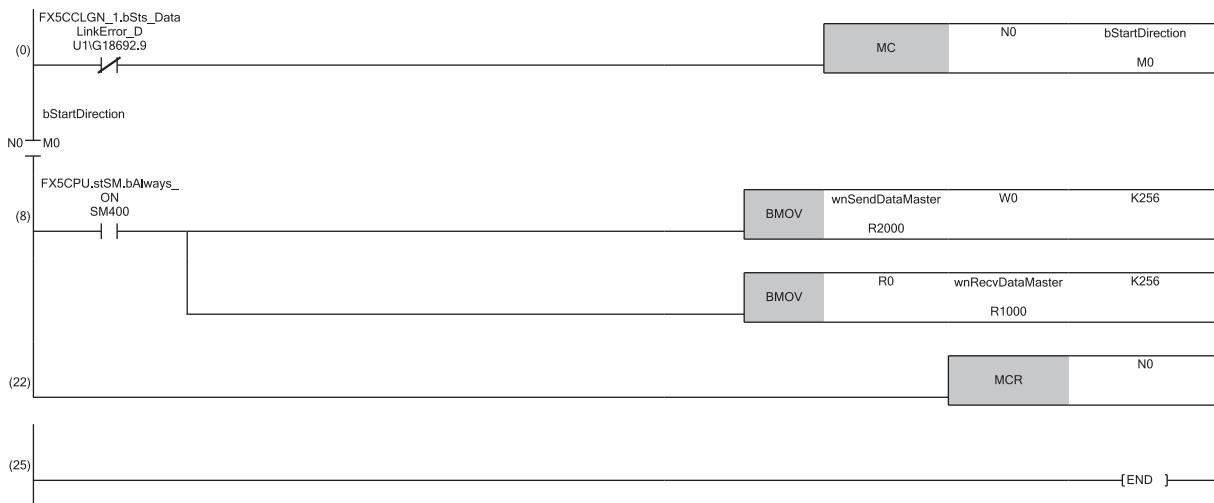
(39) Communication program with the local station (station No.2)



If no response is received for several cycles, 'Data link status of each station' (SW00B0 to SW00B7) is determined to be a cyclic transmission faulty station.

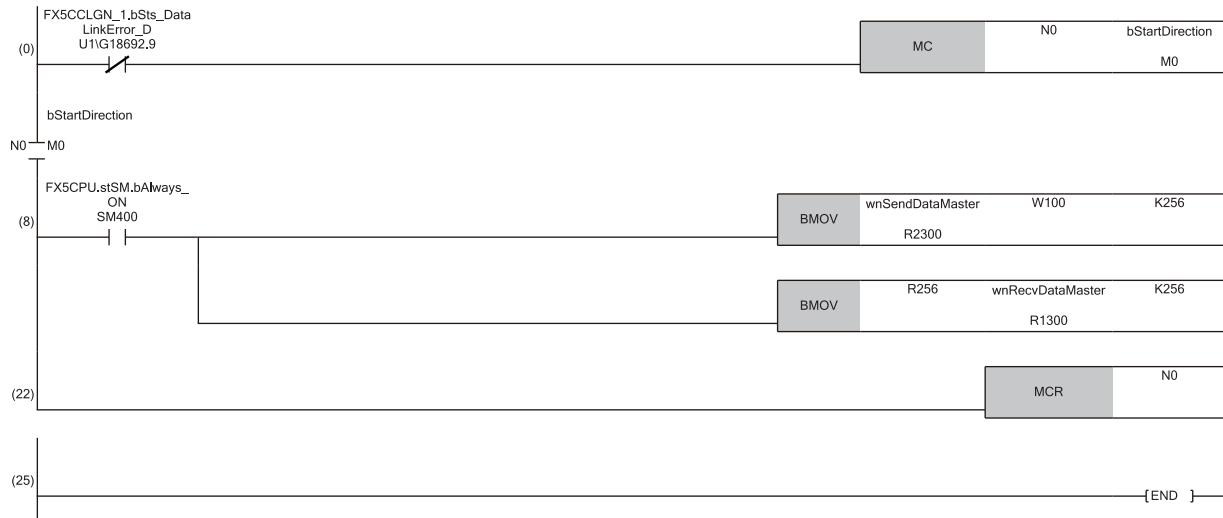
Local station (station No.1, station No.2)

Classification	Label name	Description	Device																																									
Module label	FX5CCLGN_1.bSts_DataLinkError_D	Data link error status of own station	SB0049																																									
Label to be defined	<p>Define global labels as shown below:</p> <ul style="list-style-type: none"> • Local station (station No.1) <table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>▼ M0</td> </tr> <tr> <td>2</td> <td>wnSendDataMaster</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>▼ R2000</td> </tr> <tr> <td>3</td> <td>wnRecvDataMaster</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>▼ R1000</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • Local station (station No.2) <table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>▼ M0</td> </tr> <tr> <td>2</td> <td>wnSendDataMaster</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>▼ R2300</td> </tr> <tr> <td>3</td> <td>wnRecvDataMaster</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>▼ R1300</td> </tr> </tbody> </table>					Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection	Bit	... VAR_GLOBAL	▼ M0	2	wnSendDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R2000	3	wnRecvDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R1000		Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection	Bit	... VAR_GLOBAL	▼ M0	2	wnSendDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R2300	3	wnRecvDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R1300
	Label Name	Data Type	Class	Assign (Device/Label)																																								
1	bStartDirection	Bit	... VAR_GLOBAL	▼ M0																																								
2	wnSendDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R2000																																								
3	wnRecvDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R1000																																								
	Label Name	Data Type	Class	Assign (Device/Label)																																								
1	bStartDirection	Bit	... VAR_GLOBAL	▼ M0																																								
2	wnSendDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R2300																																								
3	wnRecvDataMaster	Word [Signed]	... VAR_GLOBAL	▼ R1300																																								

■Local station (station No.1)

(8) Communication program with the master station (station No.0)

■Local station (station No.2)



(8) Communication program with the master station (station No.0)

Restriction

When "Communication Mode" is set to "Unicast", 'Data link status of each station' (SW00B0 to SW00B7) cannot be used as an interlock in the local station. Execute communications with other stations, taking account of the operating status in stations to be communicated.

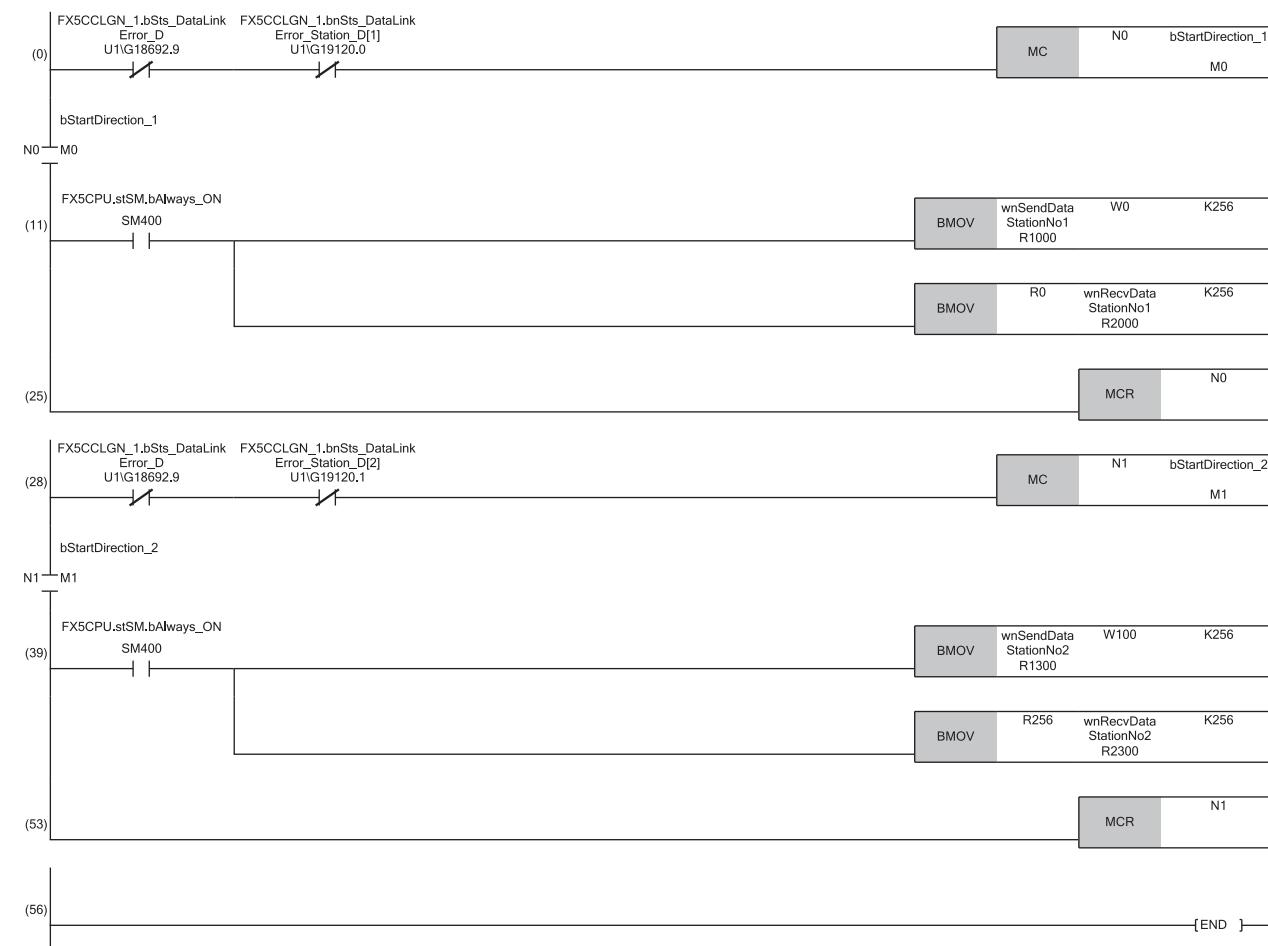
Program example (At multicast mode)

This section describes a program example when "Communication Mode" under "Application Settings" is set to "Multicast".

Master station (station No.0)

Classification	Label name	Description	Device																																			
Module label	FX5CCLGN_1.bSts_DataLinkError_D	Data link error status of own station	SB0049																																			
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[1]	Data link status of each station (station No.1)	SW00B0.0																																			
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[2]	Data link status of each station (station No.2)	SW00B0.1																																			
Label to be defined	Define global labels as shown below:																																					
	<table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection_1</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>M0</td> </tr> <tr> <td>2</td> <td>bStartDirection_2</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>M1</td> </tr> <tr> <td>3</td> <td>wnSendDataStationNo1</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R1000</td> </tr> <tr> <td>4</td> <td>wnRecvDataStationNo1</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R2000</td> </tr> <tr> <td>5</td> <td>wnSendDataStationNo2</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R1300</td> </tr> <tr> <td>6</td> <td>wnRecvDataStationNo2</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R2300</td> </tr> </tbody> </table>				Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection_1	Bit	... VAR_GLOBAL	M0	2	bStartDirection_2	Bit	... VAR_GLOBAL	M1	3	wnSendDataStationNo1	Word [Signed]	... VAR_GLOBAL	R1000	4	wnRecvDataStationNo1	Word [Signed]	... VAR_GLOBAL	R2000	5	wnSendDataStationNo2	Word [Signed]	... VAR_GLOBAL	R1300	6	wnRecvDataStationNo2	Word [Signed]	... VAR_GLOBAL	R2300
	Label Name	Data Type	Class	Assign (Device/Label)																																		
1	bStartDirection_1	Bit	... VAR_GLOBAL	M0																																		
2	bStartDirection_2	Bit	... VAR_GLOBAL	M1																																		
3	wnSendDataStationNo1	Word [Signed]	... VAR_GLOBAL	R1000																																		
4	wnRecvDataStationNo1	Word [Signed]	... VAR_GLOBAL	R2000																																		
5	wnSendDataStationNo2	Word [Signed]	... VAR_GLOBAL	R1300																																		
6	wnRecvDataStationNo2	Word [Signed]	... VAR_GLOBAL	R2300																																		

Master station (station No.0)



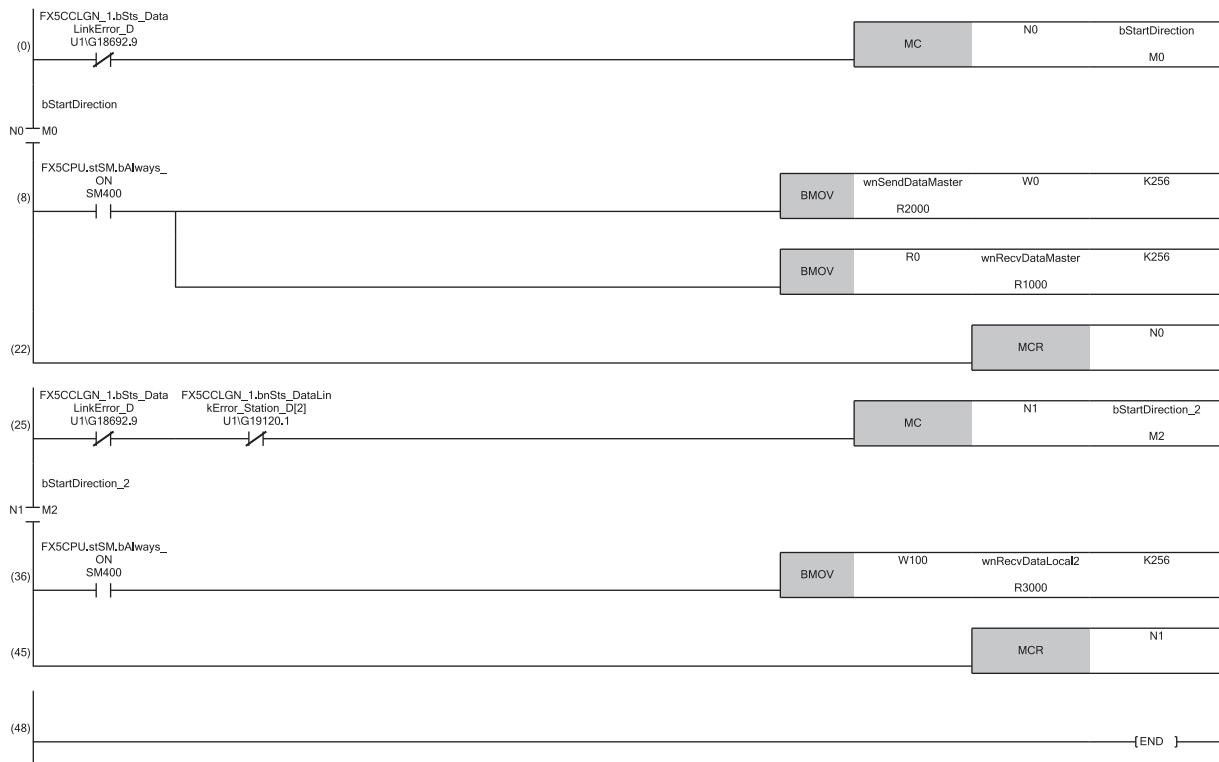
(11) Communication program with the local station (station No.1)

(39) Communication program with the local station (station No.2)

Local station (station No.1, station No.2)

Classification	Label name	Description	Device																														
Module label	FX5CCLGN_1.bSts_DataLinkError_D	Data link error status of own station	SB0049																														
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[1]	Data link status of each station (station No.1)	SW00B0.0																														
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[2]	Data link status of each station (station No.2)	SW00B0.1																														
Label to be defined	Define global labels as shown below:																																
<ul style="list-style-type: none"> Local station (station No.1) 			<table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection</td> <td>Bit</td> <td>VAR.GLOBAL</td> <td>M0</td> </tr> <tr> <td>2</td> <td>wnSendDataMaster</td> <td>Word [Signed]</td> <td>VAR.GLOBAL</td> <td>R2000</td> </tr> <tr> <td>3</td> <td>wnRecvDataMaster</td> <td>Word [Signed]</td> <td>VAR.GLOBAL</td> <td>R1000</td> </tr> <tr> <td>4</td> <td>wnRecvDataLocal2</td> <td>Word [Signed]</td> <td>VAR.GLOBAL</td> <td>R3000</td> </tr> <tr> <td>5</td> <td>bStartDirection_2</td> <td>Bit</td> <td>VAR.GLOBAL</td> <td>M2</td> </tr> </tbody> </table>		Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection	Bit	VAR.GLOBAL	M0	2	wnSendDataMaster	Word [Signed]	VAR.GLOBAL	R2000	3	wnRecvDataMaster	Word [Signed]	VAR.GLOBAL	R1000	4	wnRecvDataLocal2	Word [Signed]	VAR.GLOBAL	R3000	5	bStartDirection_2	Bit	VAR.GLOBAL	M2
	Label Name	Data Type	Class	Assign (Device/Label)																													
1	bStartDirection	Bit	VAR.GLOBAL	M0																													
2	wnSendDataMaster	Word [Signed]	VAR.GLOBAL	R2000																													
3	wnRecvDataMaster	Word [Signed]	VAR.GLOBAL	R1000																													
4	wnRecvDataLocal2	Word [Signed]	VAR.GLOBAL	R3000																													
5	bStartDirection_2	Bit	VAR.GLOBAL	M2																													
<ul style="list-style-type: none"> Local station (station No.2) 			<table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection</td> <td>Bit</td> <td>VAR.GLOBAL</td> <td>M0</td> </tr> <tr> <td>2</td> <td>wnSendDataMaster</td> <td>Word [Signed]</td> <td>VAR.GLOBAL</td> <td>R2300</td> </tr> <tr> <td>3</td> <td>wnRecvDataMaster</td> <td>Word [Signed]</td> <td>VAR.GLOBAL</td> <td>R1300</td> </tr> <tr> <td>4</td> <td>wnRecvDataLocal1</td> <td>Word [Signed]</td> <td>VAR.GLOBAL</td> <td>R3300</td> </tr> <tr> <td>5</td> <td>bStartDirection_1</td> <td>Bit</td> <td>VAR.GLOBAL</td> <td>M1</td> </tr> </tbody> </table>		Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection	Bit	VAR.GLOBAL	M0	2	wnSendDataMaster	Word [Signed]	VAR.GLOBAL	R2300	3	wnRecvDataMaster	Word [Signed]	VAR.GLOBAL	R1300	4	wnRecvDataLocal1	Word [Signed]	VAR.GLOBAL	R3300	5	bStartDirection_1	Bit	VAR.GLOBAL	M1
	Label Name	Data Type	Class	Assign (Device/Label)																													
1	bStartDirection	Bit	VAR.GLOBAL	M0																													
2	wnSendDataMaster	Word [Signed]	VAR.GLOBAL	R2300																													
3	wnRecvDataMaster	Word [Signed]	VAR.GLOBAL	R1300																													
4	wnRecvDataLocal1	Word [Signed]	VAR.GLOBAL	R3300																													
5	bStartDirection_1	Bit	VAR.GLOBAL	M1																													

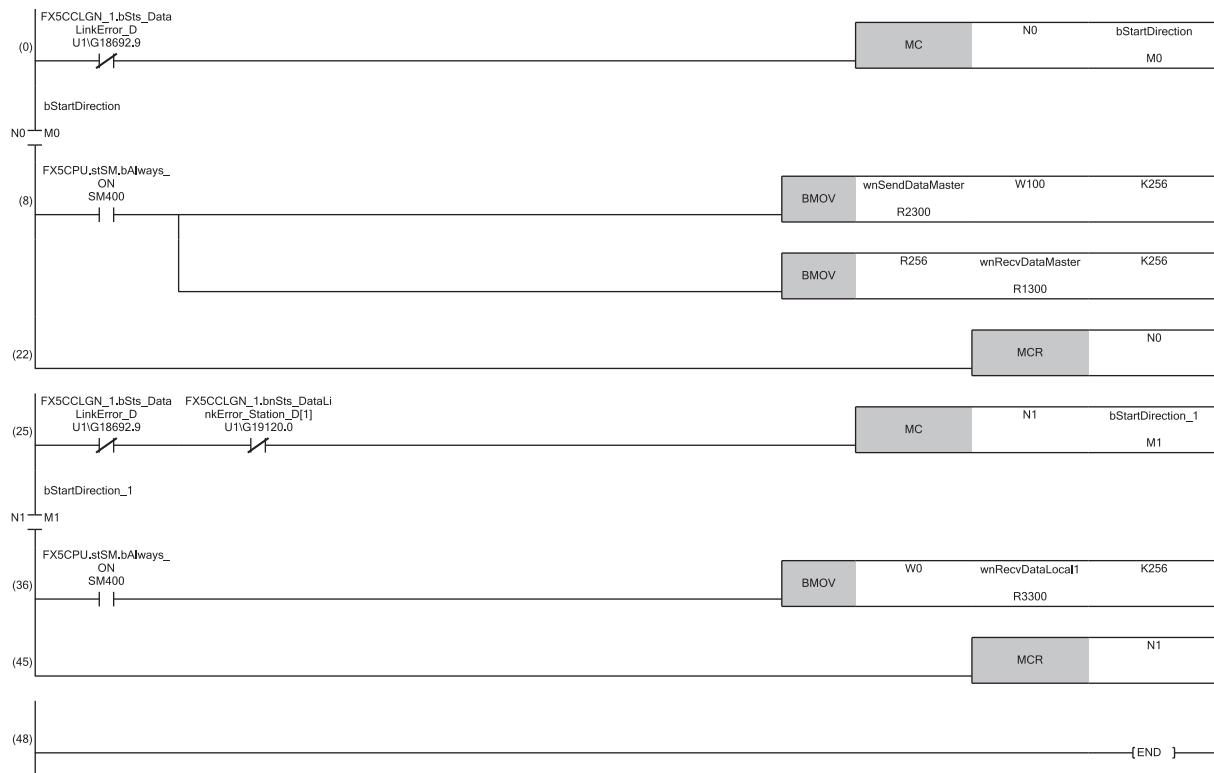
■Local station (station No.1)



(8) Communication program with the master station (station No.0)

(36) Communication program with the local station (station No.2)

■ Local station (station No.2)



(8) Communication program with the master station (station No.0)

(36) Communication program with the local station (station No.1)

9.3 Examples of Communication with Authentication Class A Remote Stations

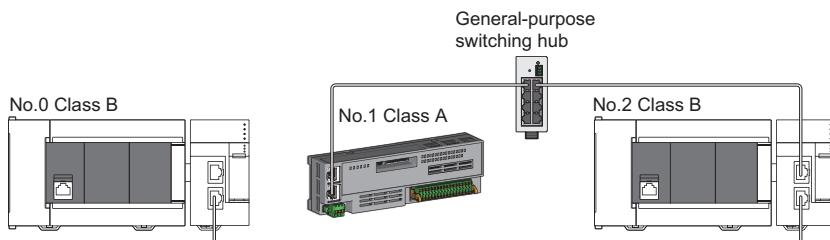
When "Communication Mode" is set to "Multicast", the local station cannot obtain data output by the authentication Class A remote station. Use the following communication examples so that the local station can obtain data output by the authentication Class A remote station.

System configuration

The following is an example of communications between the authentication Class B master station (station No.0), authentication Class A remote station (station No.1), and local station (station No.2).

System configuration

- CPU module: FX5 CPU module
- Master/local module: FX5-CCLGN-MS
- Remote module: Authentication Class A remote station



No.0: Authentication Class B master station (station No.0)

No.1: Authentication Class A remote station (station No.1)

No.2: Authentication Class B local station (station No.2)

Link device assignment

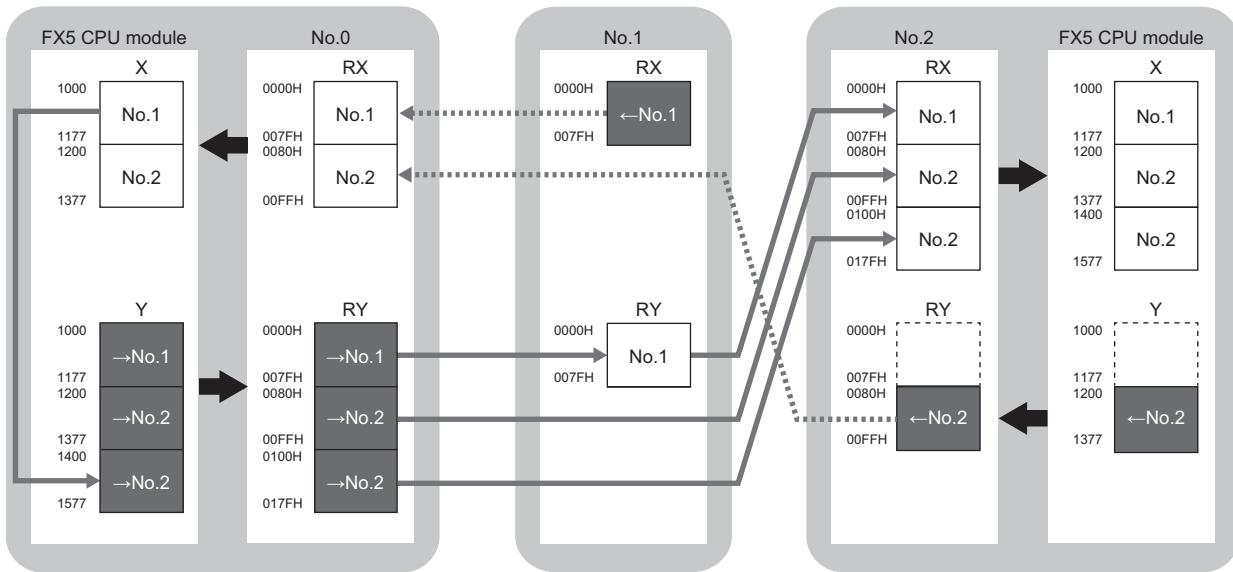
For RX and RWr, 128 points are assigned to each station.

For RY and RWw, 128 points are assigned to a remote station and 256 points to a local station.

■RX/RY assignment

Each of the following No.0 to No.2 represents a station number.

- No.0: Master station (station No.0)
- No.1: Remote station (station No.1)
- No.2: Local station (station No.2)



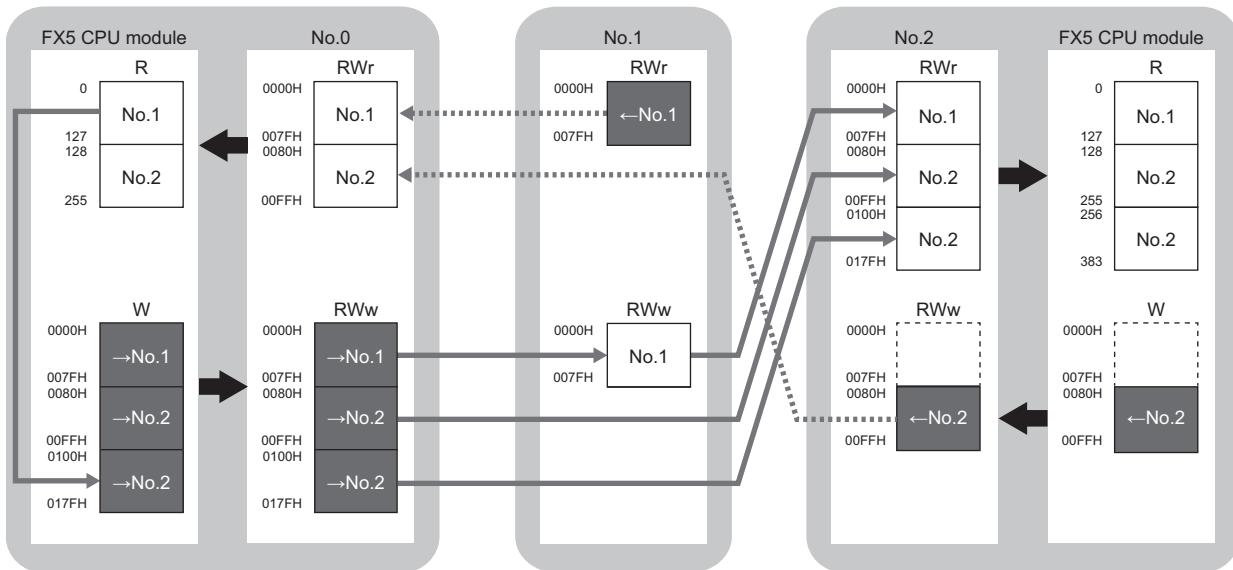
→No.1, →No.2: Send range: to station No.1, send range: to station No.2

←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

■RW_r/RW_w assignment

Each of the following No.0 to No.2 represents a station number.

- No.0: Master station (station No.0)
- No.1: Remote station (station No.1)
- No.2: Local station (station No.2)



→No.1, →No.2: Send range: to station No.1, send range: to station No.2

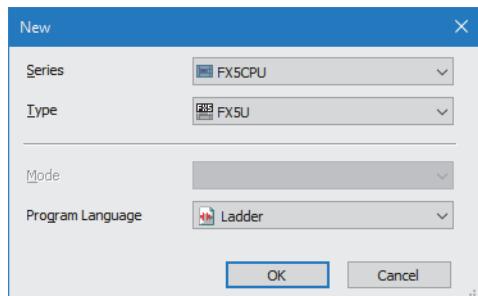
←No.1, ←No.2: Send range: from station No.1, send range: from station No.2

Setting in the master station

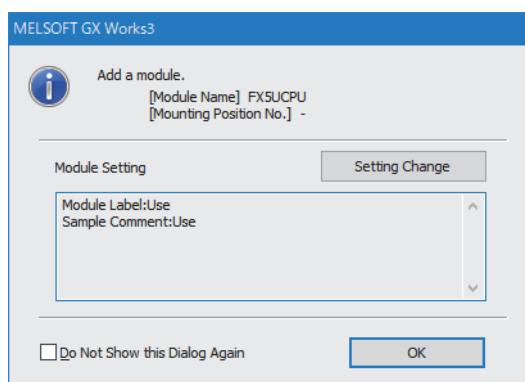
Connect the engineering tool to the FX5 CPU module on the master station and set the parameters.

1. Set the FX5 CPU module as follows.

→ [Project] ⇒ [New]

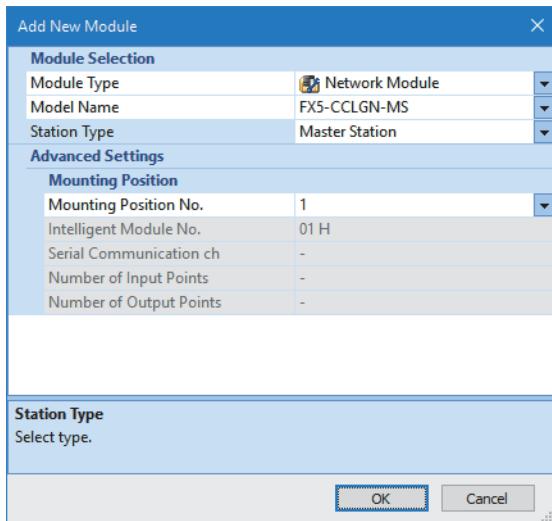
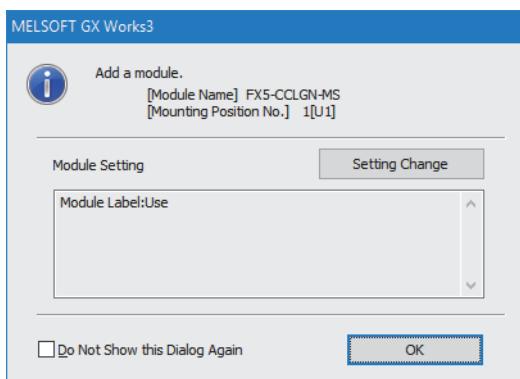


2. Click the [Setting Change] button to use the module label.



3. Set the FX5-CCLGN-MS as follows.

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

**4.** Click the [OK] button to add a module label of the FX5-CCLGN-MS.

5. Set the items in "Required Settings" as follows.

☛ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Required Settings]

Setting Item	
Item	Setting
Station Type	
Station Type	Master Station
Network No.	
Network No.	1
Parameter Setting Method	
Setting Method of Basic/Application Settings	Parameter Editor
Station No./IP Address Setting	
Station No./IP Address Setting Method	Parameter Editor
Station No.	
Station No.	0
IP Address	
IP Address	192.168.3.249
Subnet Mask	...
Default Gateway	...

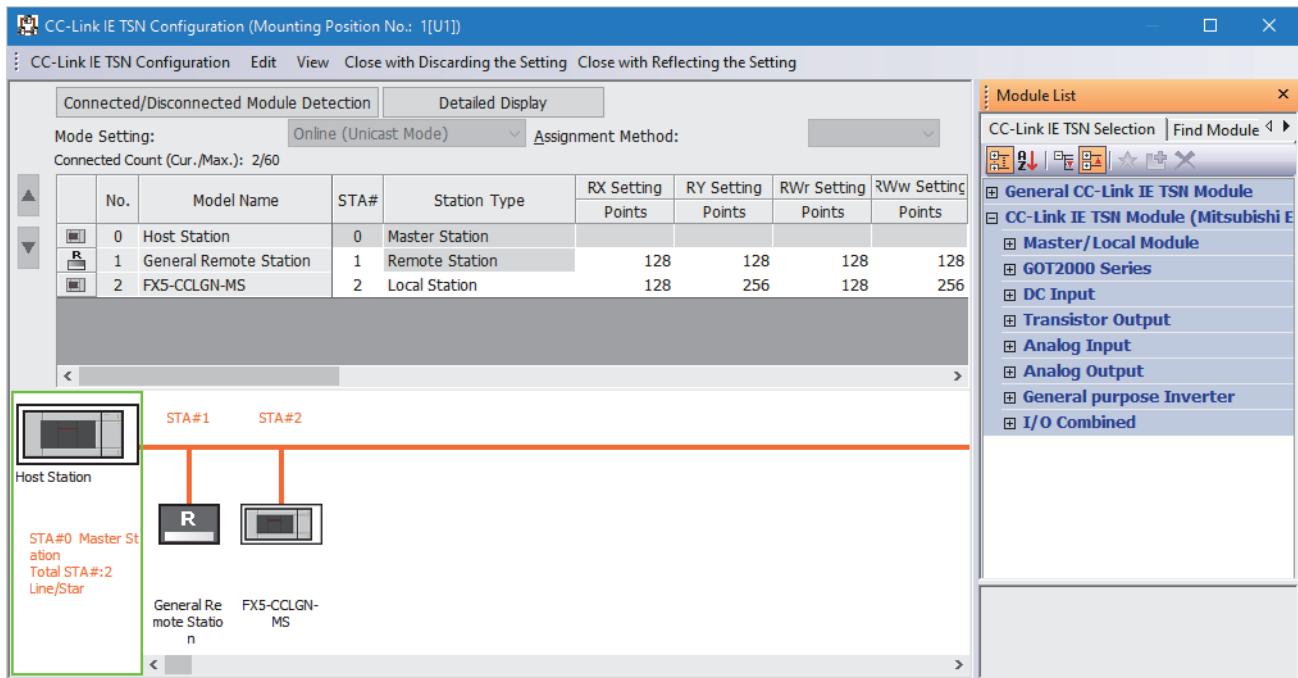
6. Set the items in "Basic Settings" as follows.

☛ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Network Configuration Settings	
Network Configuration Settings	<Detailed Setting>
Refresh Settings	
Refresh Settings	<Detailed Setting>
Network Topology	
Network Topology	Line/Star
Communication Period Setting	
Basic Period Setting	
Setting in Units of 1us	Not Set
Communication Period Interval Setting (Do not Set it in Units of 1us)	1000.00 us
Communication Period Interval Setting (Set it in Units of 1us)	1000.00 us
System Reservation Time	20.00 us
Cyclic Transmission Time	500.00 us
Transient Transmission Time	300.00 us
Multiple Period Setting	
Normal-Speed	×4
Low-Speed	×16
Connection Device Information	
Authentication Class Setting	Mixture of Authentication Class B/A or Authentication Class A Only
Slave Station Setting	
Disconnection Detection Setting	4 times

7. Set the network configuration as follows. (Set the IP address for each station.)

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Basic Settings] ⇒ [Network Configuration Settings]



8. Click the [Close with Reflecting the Setting] button to close the "CC-Link IE TSN Configuration" window.

9. Set the refresh settings as follows.

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Basic Settings] ⇒ [Refresh Settings]

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	▼			◀▶	▼				
-	SW	▼			◀▶	▼				
1	RX	▼	256	00000	000FF	Specify Device	▼	X	▼	256 1000 1377
2	RY	▼	384	00000	0017F	Specify Device	▼	Y	▼	384 1000 1577
3	Rlw	▼	384	00000	0017F	Specify Device	▼	W	▼	384 00000 0017F
4	Rwr	▼	256	00000	000FF	Specify Device	▼	R	▼	256 0 255

10. Set the items in "Application Settings" as follows.

☛ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Application Settings]

Setting Item	
Item	Setting
Communication Speed	
Communication Speed	1Gbps
Supplementary Cyclic Settings	
Station-based Block Data Assurance	Enable
I/O Maintenance Settings	
Output Hold/Clear Setting during CPU STOP	Hold
Data Link Error Station Setting	Clear
Output Mode upon CPU Error	Clear
Transient Transmission Group No.	
Transient Transmission Group No.	0
Communication Mode	
Communication Mode	Multicast
Parameter Name	
Parameter Name	
Module Operation Mode	
Module Operation Mode	Online
Security	
IP Filter Settings	
IP Filter	Disable
IP Filter Settings	<Detailed Setting>

11. Click the [Apply] button.

12. Write the set parameters to the FX5 CPU module on the master station. Then, reset the FX5 CPU module or power off and on the system.

☛ [Online] ⇒ [Write to PLC]



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

☛ Page 89 PARAMETER SETTINGS

Remote station settings

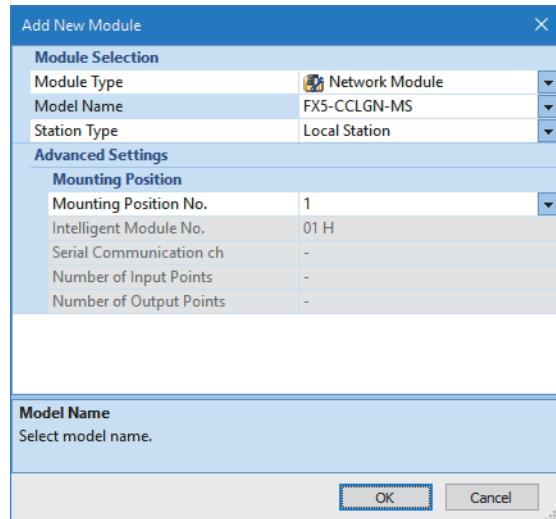
Set the setting of the IP address set in "Network Configuration Settings" of the master station.

Settings in the local stations

Connect the engineering tool to the FX5 CPU module on the local station and set parameters.

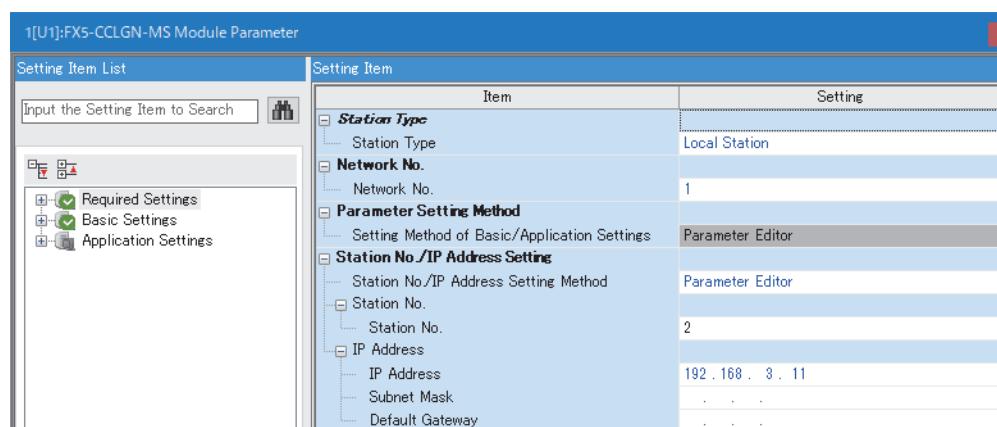
1. Set the FX5 CPU module and add the module labels of the FX5 CPU module. The setting method of the FX5 CPU module and addition method of the module label are the same as those of the master station. (☞ Page 128 Setting in the master station)
2. Set the FX5-CCLGN-MS as follows.

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



3. Set to use the FX5-CCLGN-MS module label. The addition method of the module label is the same as that of the master station. (☞ Page 128 Setting in the master station)
4. Set the items in "Required Settings" as follows.

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Required Settings]



5. Set the refresh settings as follows.

☛ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Basic Settings] ⇒ [Refresh Settings]

No.	Link Side					CPU Side					
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
-	SB	▼			↔	▼					
-	SW	▼			↔	▼					
1	RX	▼	384	00000	0017F	Specify Device	▼ X	▼	384	1000	1577
2	RY	▼	256	00000	000FF	Specify Device	▼ Y	▼	256	1000	1377
3	Rlw	▼	256	00000	000FF	Specify Device	▼ W	▼	256	00000	000FF
4	Rlw	▼	384	00000	0017F	Specify Device	▼ R	▼	384	0	383

6. Set the items in "Application Settings" as follows.

☛ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-CCLGN-MS] ⇒ [Application Settings]

Setting Item	
Item	Setting
Communication Speed	1Gbps
Communication Speed	1Gbps
Supplementary Cyclic Settings	
I/O Maintenance Settings	
Output Hold/Clear Setting during CPU STOP	Hold
Data Link Error Station Setting	Clear
Output Mode upon CPU Error	Clear
Transient Transmission Group No.	0
Parameter Name	
Parameter Name	
Module Operation Mode	Online
Security	
IP Filter Settings	
IP Filter	Disable
IP Filter Settings	<Detailed Setting>

7. Click the [Apply] button.

8. Write the set parameters to the FX5 CPU module on the local station. Then, reset the FX5 CPU module or power off and on the system.

☛ [Online] ⇒ [Write to PLC]



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

☛ Page 89 PARAMETER SETTINGS

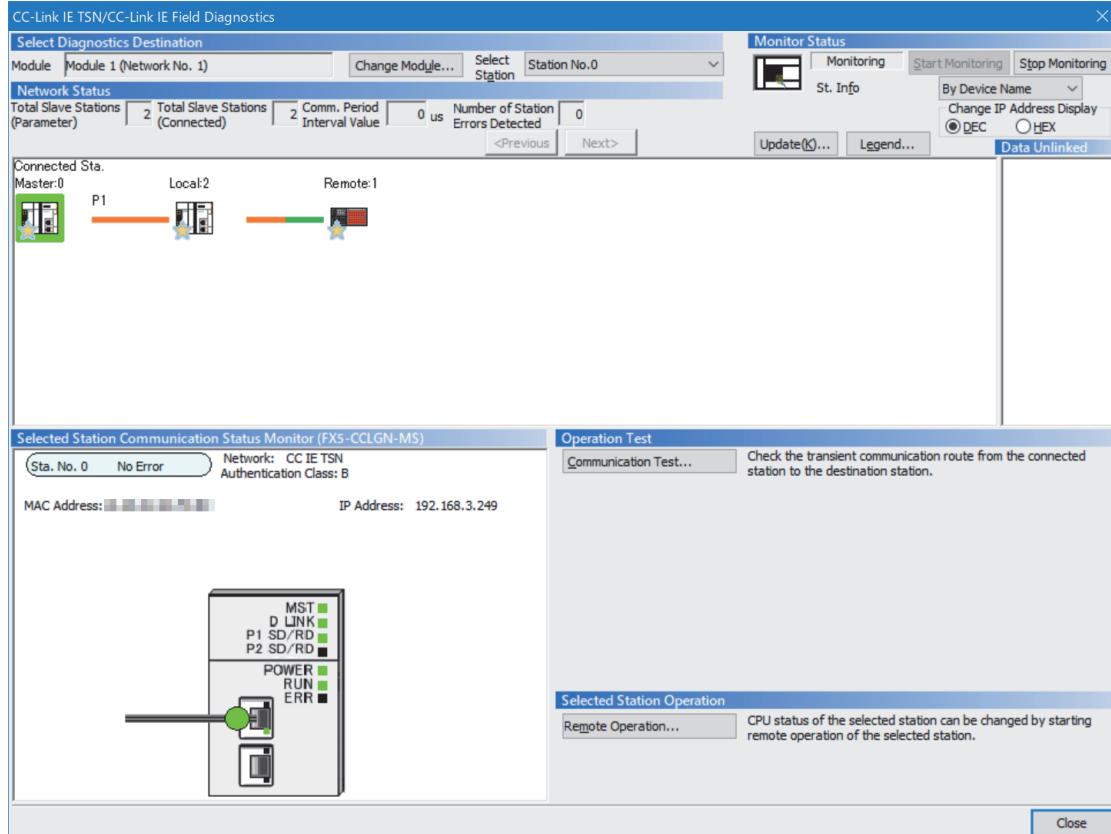
Checking the network status

After starting up the system, check whether data link can be normally performed. For the check, use the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool.

1. Connect the engineering tool to the FX5 CPU module on the master station.
2. Start the CC-Link IE TSN/CC-Link IE Field diagnostics.

☞ [Diagnostics] ⇒ [CC-Link IE TSN/CC-Link IE Field Diagnostics]

If the following display appears, a data link is normal.



If an error icon appears in "Network Status" area, use the CC-Link IE TSN/CC-Link IE Field diagnostics to identify the cause of the error and take corrective actions. (☞ Page 144 Checking the Network Status)

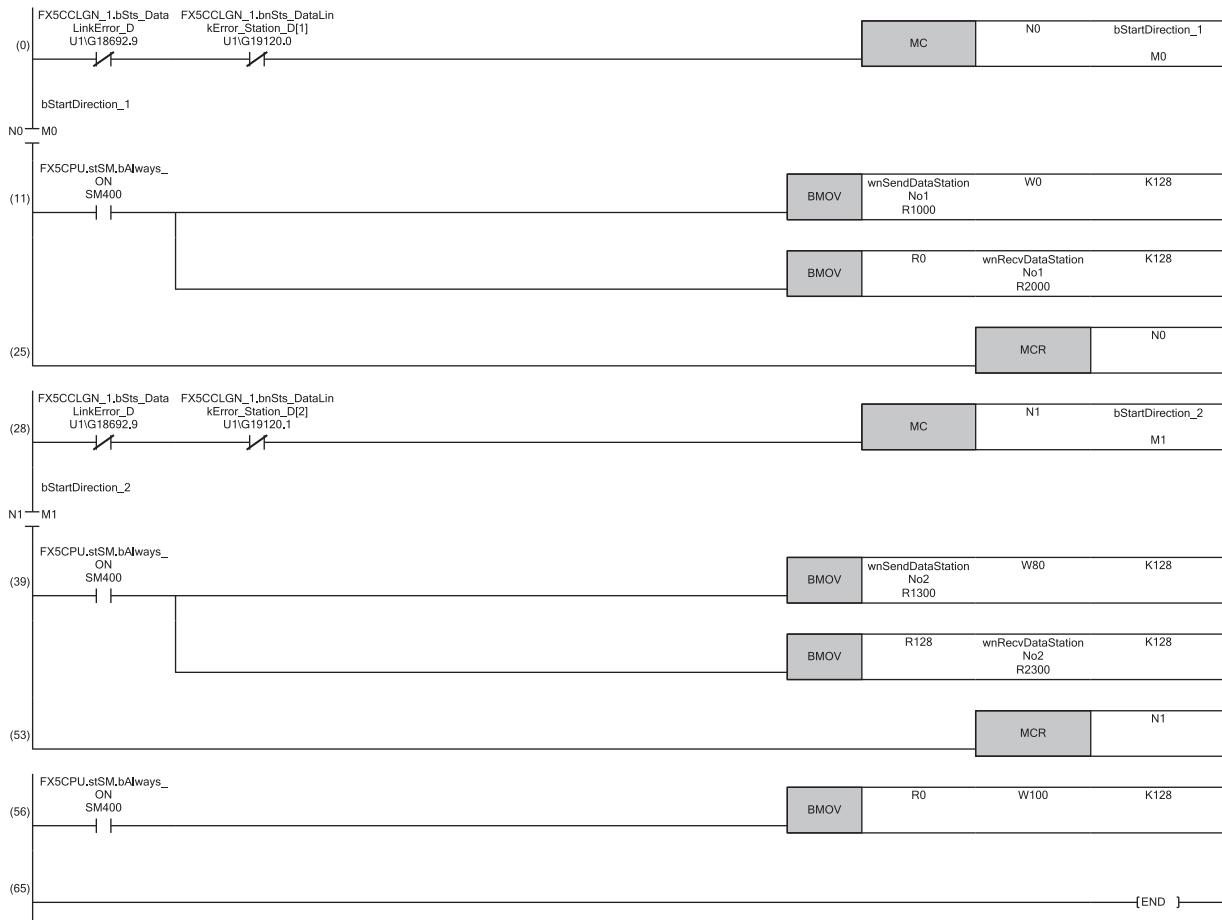
Program examples

The following is a program example of communications between the authentication Class B master station (station No.0), authentication Class A remote station (station No.1), and local station (station No.2).

Master station (station No.0)

Classification	Label name	Description	Device																												
Module label	FX5CCLGN_1.bSts_DataLinkError_D	Data link error status of own station	SB0049																												
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[1]	Data link status of each station (station No.1)	SW00B0.0																												
	FX5CCLGN_1.bnSts_DataLinkError_Station_D[2]	Data link status of each station (station No.2)	SW00B0.1																												
Label to be defined	Define global labels as shown below:																														
	<table border="1"> <thead> <tr> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1 bStartDirection_1</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>M0</td> </tr> <tr> <td>2 bStartDirection_2</td> <td>Bit</td> <td>... VAR_GLOBAL</td> <td>M1</td> </tr> <tr> <td>3 wnSendDataStationNo1</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R1000</td> </tr> <tr> <td>4 wnRecvDataStationNo1</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R2000</td> </tr> <tr> <td>5 wnSendDataStationNo2</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R1300</td> </tr> <tr> <td>6 wnRecvDataStationNo2</td> <td>Word [Signed]</td> <td>... VAR_GLOBAL</td> <td>R2300</td> </tr> </tbody> </table>			Label Name	Data Type	Class	Assign (Device/Label)	1 bStartDirection_1	Bit	... VAR_GLOBAL	M0	2 bStartDirection_2	Bit	... VAR_GLOBAL	M1	3 wnSendDataStationNo1	Word [Signed]	... VAR_GLOBAL	R1000	4 wnRecvDataStationNo1	Word [Signed]	... VAR_GLOBAL	R2000	5 wnSendDataStationNo2	Word [Signed]	... VAR_GLOBAL	R1300	6 wnRecvDataStationNo2	Word [Signed]	... VAR_GLOBAL	R2300
Label Name	Data Type	Class	Assign (Device/Label)																												
1 bStartDirection_1	Bit	... VAR_GLOBAL	M0																												
2 bStartDirection_2	Bit	... VAR_GLOBAL	M1																												
3 wnSendDataStationNo1	Word [Signed]	... VAR_GLOBAL	R1000																												
4 wnRecvDataStationNo1	Word [Signed]	... VAR_GLOBAL	R2000																												
5 wnSendDataStationNo2	Word [Signed]	... VAR_GLOBAL	R1300																												
6 wnRecvDataStationNo2	Word [Signed]	... VAR_GLOBAL	R2300																												

■Master station (station No.0)



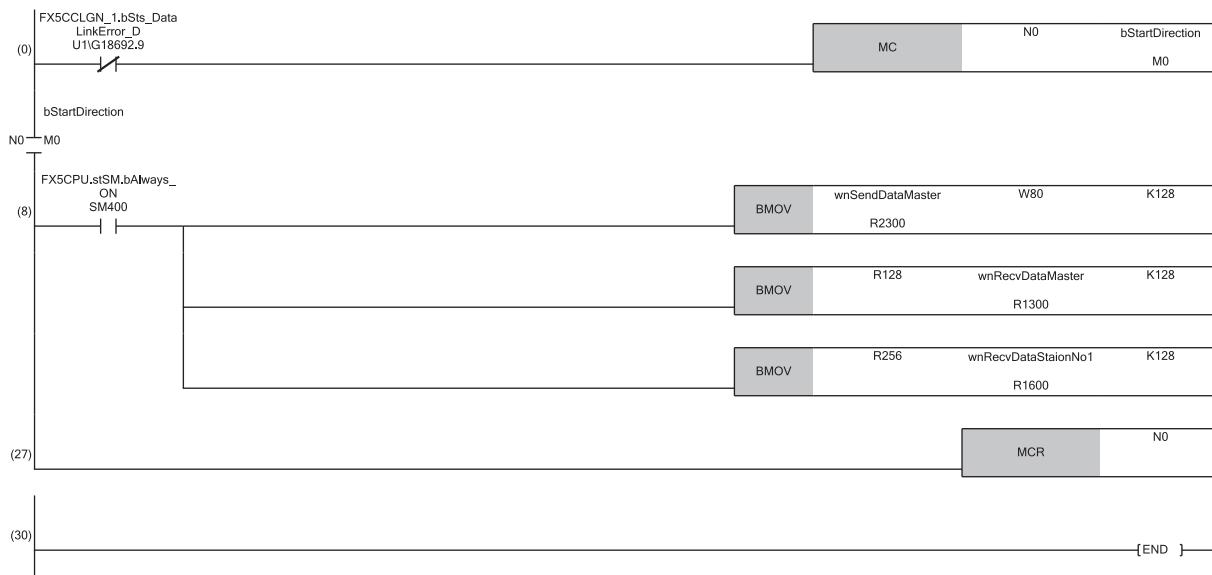
(11) Communication program with the remote station (station No.1)

(39) Communication program with the local station (station No.2)

(56) Program for sending data received from the remote station (station No.1) to the local station (station No.2)

Local station (station No.2)

Classification	Label name	Description	Device																									
Module label	FX5CCLGN_1.bSts_DataLinkError_D	Data link error status of own station	SB0049																									
Label to be defined	Define global labels as shown below: • Local station (station No.2)																											
	<table border="1"> <thead> <tr> <th></th> <th>Label Name</th> <th>Data Type</th> <th>Class</th> <th>Assign (Device/Label)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>bStartDirection</td> <td>Bit</td> <td>...</td> <td>VAR_GLOBAL M0</td> </tr> <tr> <td>2</td> <td>wnSendDataMaster</td> <td>Word [Signed]</td> <td>...</td> <td>VAR_GLOBAL R2300</td> </tr> <tr> <td>3</td> <td>wnRecvDataMaster</td> <td>Word [Signed]</td> <td>...</td> <td>VAR_GLOBAL R1300</td> </tr> <tr> <td>4</td> <td>wnRecvDataStationNot</td> <td>Word [Signed]</td> <td>...</td> <td>VAR_GLOBAL R1600</td> </tr> </tbody> </table>				Label Name	Data Type	Class	Assign (Device/Label)	1	bStartDirection	Bit	...	VAR_GLOBAL M0	2	wnSendDataMaster	Word [Signed]	...	VAR_GLOBAL R2300	3	wnRecvDataMaster	Word [Signed]	...	VAR_GLOBAL R1300	4	wnRecvDataStationNot	Word [Signed]	...	VAR_GLOBAL R1600
	Label Name	Data Type	Class	Assign (Device/Label)																								
1	bStartDirection	Bit	...	VAR_GLOBAL M0																								
2	wnSendDataMaster	Word [Signed]	...	VAR_GLOBAL R2300																								
3	wnRecvDataMaster	Word [Signed]	...	VAR_GLOBAL R1300																								
4	wnRecvDataStationNot	Word [Signed]	...	VAR_GLOBAL R1600																								

■Local station (station No.2)

(8) Communication program with the master station (station No.0) and the remote station (station No.1)

10 TROUBLESHOOTING

This chapter describes troubleshooting of CC-Link IE TSN.

10.1 Checking with LED

This section describes troubleshooting with LEDs.

When the RUN LED turns off

When the RUN LED turns off after powering on the FX5-CCLGN-MS, check the following.

Check item	Action
Is the FX5-CCLGN-MS mounted correctly?	Securely mount the FX5-CCLGN-MS on the FX5 CPU module.

If the above action does not solve the problem, perform the module communication test to check for hardware failure. ( Page 143 Module communication test)

When the ERROR LED turns on or is flashing

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

Check item	Action
Does any error occur in the module diagnostics?	Take the actions displayed on the window.
Is a disconnected station displayed by the CC-Link IE TSN/CC-Link IE Field diagnostics?	<ul style="list-style-type: none">• Perform the network configuration setting in accordance with the station actually connected.• Execute the following for the disconnected station.  Page 139 When the D LINK LED turns off or is flashing
Are RX, RY, RWr, and RWw assigned for the CC-Link IE TSN configuration of the master station?	Check that all the assignment of RX, RY, RWr, and RWw of a station where an error occurs is not blank.

If the above actions do not solve the problem, perform the module communication test to check for hardware failure. ( Page 143 Module communication test)

When the D LINK LED turns off or is flashing

When the D LINK LED turns off or is flashing, check the following.

Check item	Action
Is the master station operating normally?	<ul style="list-style-type: none"> If an error occurs in the FX5 CPU module on the master station, eliminate the cause of the FX5 CPU module error. If an error occurs in the FX5-CCLGN-MS on the master station, take action according to the module diagnosis procedure.
Is the master station connected to the network?	Connect the master station to the network.
Does the IP address of each station match the "Network Configuration Settings" of the master station?	Correct the setting of the IP address in "Network Configuration Settings" of the master station. <ul style="list-style-type: none"> Set IP addresses in a way that does not duplicate the third to fourth octets of the IP address in all stations. Set the IP address and subnet mask to match the network addresses of all stations. Set the third and fourth octets of the IP address to values other than all 0 or all 1. Set the host section to a value other than all 0 or all 1. Set an address other than some reserved addresses fixed for special purposes as the IP address.
In the "Network Configuration Settings" of the master station, are the third and fourth octets of the IP address duplicated with those of any other stations?	
In the "Network Configuration Settings" of the master station, does the network address (the subnet mask part of the IP address) match the master station?	
Are the third and fourth octets of the IP address set to values other than all 0 or all 1?	
Is the host section set to a value other than all 0 or all 1?	
Is there a reserved address fixed for a special purpose set as the IP address?	
Do the used Ethernet cables conform to the Ethernet standard?	Replace the cables with Ethernet cables which conform to the standard. (☞ Page 16 Performance Specifications of CC-Link IE TSN)
Is the switching hub used operating normally?	<ul style="list-style-type: none"> Use a switching hub that conforms to the standard. (☞ Page 16 Performance Specifications of CC-Link IE TSN) Power off and on the switching hub.
Does the station-to-station distance meet the specifications?	Set the station-to-station distance within range. (☞ Page 16 Performance Specifications of CC-Link IE TSN)
Does the cabling condition (bending radius) meet the specifications?	Refer to the manual for the Ethernet cable, and correct the bending radius.
Is any Ethernet cable disconnected?	Replace the Ethernet cable.
Is the network configured in the ring topology?	Configure the network to avoid the ring topology.
Has the time synchronization source station been reset?	<ul style="list-style-type: none"> Since a station is temporarily disconnected after switching the time synchronization source, wait for it to return. Avoid unnecessary disconnections or returns in a station that is the time synchronization source.
Is the time synchronization source station turned off?	
Is the time synchronization source station operating normally?	Take action by referring to the manual for the time synchronization device.
Has any other station been reset?	<ul style="list-style-type: none"> Avoid unnecessary reset since a station is disconnected while resetting. Start other stations.
Are other stations turned off?	Power on other stations.
Are other stations connected to the FX5-CCLGN-MS operating normally?	Execute the CC-Link IE TSN/CC-Link IE Field diagnostics from the master station to identify the faulty module of another station. After identification, take action by referring to the manual for the relevant module.
Is the IP address of another station set?	Set an IP address to a slave station with no IP address setting.
Are other stations set in the network configuration of the master station?	Set connected slave stations in the network configuration of the master station.
Is a type of wiring described in the restrictions in the wiring specifications mistakenly performed?	Correct the wiring. (☞ Page 85 WIRING)
Are station numbers unique?	Change the duplicated station number.
Is the IP address duplicated with another station?	Change the IP address of the duplicated station.
Are 61 or more slave stations connected? (When used as a master station)	Make adjustment so that the number of connected slave stations is within 60 when the master station operates, and within 120 when local stations operate.
Are 121 or more slave stations connected? (When used as a local station)	
Do CC-Link IE TSN devices and Ethernet devices coexist?	Correct the wiring. (☞ Page 85 WIRING)
Does the IP filter setting mistakenly block communications from the IP address of another station?	Change the IP filter setting parameter to allow communication for the IP address of another station.
Are time synchronization devices with time synchronization priority of 0 to 15 connected?	<ul style="list-style-type: none"> Remove time synchronization devices with time synchronization priority of 0 to 15, or change the priority to between 16 and 255. Manual for the time synchronization devices used

When the L ER LED turns on

When the L ER LED turns on, check the following.

Check item	Action
Are the Ethernet cables used normally?	<ul style="list-style-type: none">• Use an Ethernet cable that conforms to the standard. (☞ Page 16 Performance Specifications of CC-Link IE TSN)• Set the station-to-station distance within range. (☞ Page 16 Performance Specifications of CC-Link IE TSN)• If the Ethernet cable is disconnected, reconnect it.
Is the switching hub used operating normally?	<ul style="list-style-type: none">• Use a switching hub that conforms to the standard. (☞ Page 16 Performance Specifications of CC-Link IE TSN)• Power off and on the switching hub.
Is "Module Operation Mode" under "Application Settings" of the master station set to "Online"?	Set "Module Operation Mode" under "Application Settings" of the master station to "Online".
Is there any source of noise near the module or cables?	Change the location of the module or cables.

When the LINK LED turns off

When the LINK LED turns off, check the following.

Check item	Action
Do the used Ethernet cables conform to the Ethernet standard?	Replace the cables with Ethernet cables which conform to the standard. (☞ Page 88 Ethernet cable)
Does the station-to-station distance meet the specifications?	Set the station-to-station distance within range. (☞ Page 16 Performance Specifications of CC-Link IE TSN)
Does the cabling condition (bending radius) meet the specifications?	Refer to the manual for the Ethernet cable, and correct the bending radius.
Is any Ethernet cable disconnected?	Replace the Ethernet cable.
Is the switching hub used operating normally?	<ul style="list-style-type: none">• Use a switching hub that conforms to the standard. (☞ Page 88 Switching hub)• Power off and on the switching hub.
Are other stations connected to the FX5-CCLGN-MS operating normally?	Take action by referring to the manual for the modules of other stations.
Is the communication speed of connected devices 1Gbps?	Connect devices which support a communication speed of 1Gbps.

If the above actions do not solve the problem, perform the module communication test to check for hardware failure. (☞

Page 143 Module communication test)

10.2 Checking the Module Status

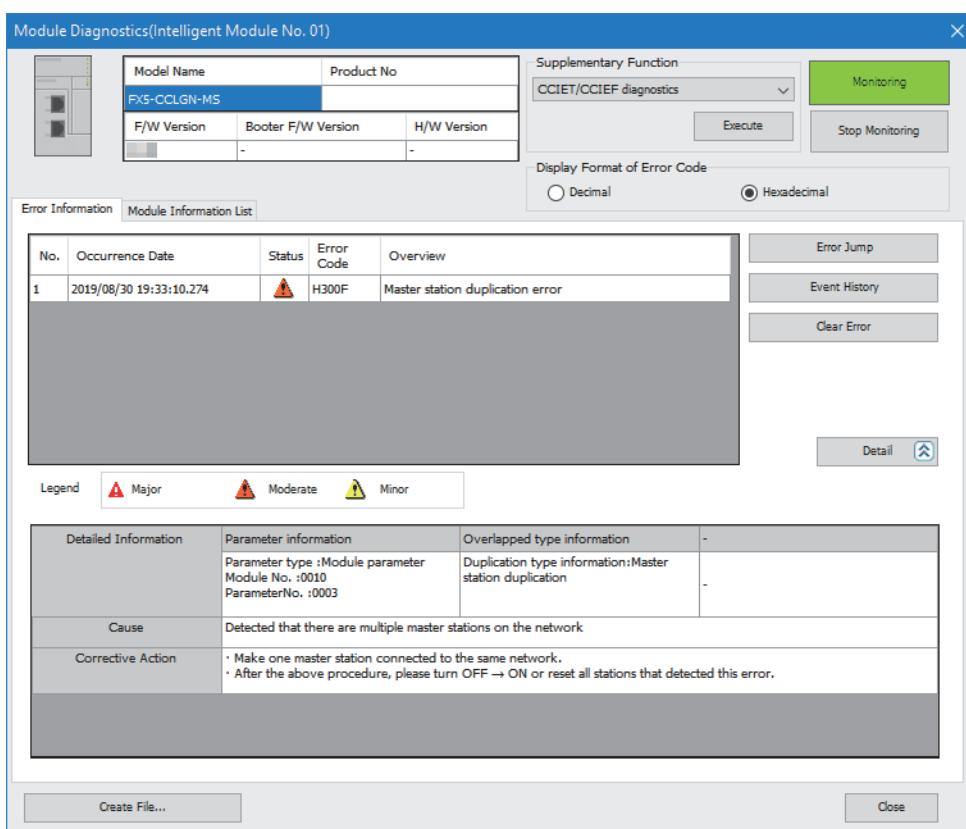
Module diagnostics

The following items can be checked in the "Module Diagnostics" window for the FX5-CCLGN-MS.

Item		Description
[Error Information] tab		Displays the details of the errors currently occurring and the corrective actions for these errors. "-" may be displayed in "Occurrence Data" of an error that occurred immediately after the power was turned on.
[Module Information List] tab		Displays the LED information and individual information of the FX5-CCLGN-MS.
Supplementary Function	CCIET/CCIEF diagnostics	Enables checking the cause to resolve the problem when an error occurs in the CC-Link IE TSN. (☞ Page 144 Checking the Network Status)

Error Information

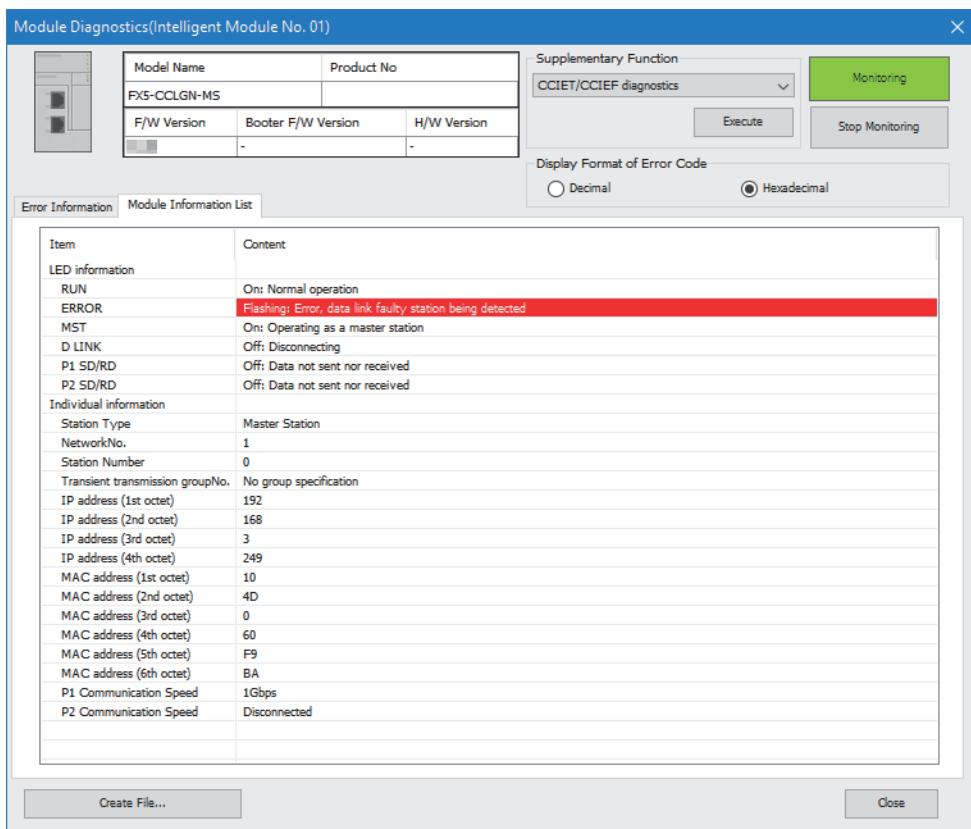
The details of the errors currently occurring and the corrective actions for these errors are displayed in the [Error Information] tab.



Item		Description
Status	Major:	An error such as hardware failure or memory failure. The module stops operating.
	Moderate:	An error, such as parameter error, which affects module operation. The module stops operating.
	Minor:	An error such as communication failure. The module continues operating.
Error code	(☞ Page 159 List of Error Codes)	
[Event History] button	Click this button to check the history of errors that have occurred on the network, errors detected for each module, and operations that have been executed. (☞ Page 180 Event List)	
Detailed Information	Displays up to three information items for each error, such as parameter information, operation source information, and system configuration information. (☞ Page 179 List of Parameter Numbers)	
Cause	Displays the detailed error causes.	
Action	Displays the actions to eliminate the error causes.	

Module Information List

The LED information and individual information of the FX5-CCLGN-MS are displayed in the [Module Information List] tab.



Item	Description	
LED information	Displays the LED status of the FX5-CCLGN-MS.	
Individual information	Station Type	Displays the station type set for the selected module.
	Network No.	Displays the network number set for the selected module.
	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.
	IP address	Displays the IP address set for the selected module.
	MAC address	Displays the MAC address of the selected module.
	P1 Communication Speed	Displays the communication speed set using the auto-negotiation function.
	P2 Communication Speed	

Module communication test

The module communication test checks the hardware of the FX5-CCLGN-MS. The module hardware is checked when the communication using the FX5-CCLGN-MS is unstable.

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 communication can be performed normally with the Ethernet cable connected between two connectors of the module.

Procedure

1. Set the following setting to "Module Communication Test".

 [Navigation window] \Rightarrow [Parameter] \Rightarrow [Module Information] \Rightarrow Target module \Rightarrow [Module Parameter] \Rightarrow [Application Settings] \Rightarrow [Module Operation Mode]

2. Connect the P1 and P2 of the FX5-CCLGN-MS with an Ethernet cable.

3. Write the module parameters to the FX5 CPU module.

4. Reset or power off and on the FX5 CPU module to start the module communication test.

Point

- Do not execute access to buffer memory during the module communication test. Otherwise, the test may be completed with an error.
- Do not perform a module communication test while connected to another station. The operation of the other station may fail. Be sure to use an Ethernet cable to connect together the P1 and P2 of the FX5-CCLGN-MS on which a module communication test is performed.

Checking on the status and result of the module communication test

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

Test status	RUN LED	ERROR LED
Test in progress	Flashing	Off
Normal completion	On	Off
Completed with an error	On	On

10.3 Checking the Network Status

The network status is checked and troubleshooting is performed by using the CC-Link IE TSN/CC-Link IE Field diagnostics to check the network status and error definition and by performing an operation test to check communications.

CC-Link IE TSN/CC-Link IE Field diagnostics

For CC-Link IE TSN, perform status monitoring, operation tests, or others.

Precautions

In the following cases, the CC-Link IE TSN/CC-Link IE Field diagnostics cannot start.

- The FX5-CCLGN-MS is not connected to FX5 CPU modules specified on the "Specify Connection Destination Connection" window.
- "Module Operation Mode" under "Application Settings" of the FX5-CCLGN-MS is not set to online mode.
- The module error (error code: 20E0H) occurs.
- The engineering tool is not connected to a station with the same communication speed as the master station.
- The network topology of the diagnostics destination does not support the version of the engineering tool or module.

Function list

The following table lists the functions of the CC-Link IE TSN/CC-Link IE Field diagnostics.

○: Diagnosed △: Diagnosed with restrictions ×: Not diagnosed

Function type	Function	Description	Connection destination of engineering tool		Reference
			Master station	Local station	
Network status monitor function	Network map	<ul style="list-style-type: none">• Displays the network configuration of CC-Link IE TSN. This function displays the current status of the same network as a network map, and displays the Ethernet cable connection status, IP address duplication, and station disconnection status. A network map to be displayed is automatically generated from the current configuration on the network.• Whether an error occurred in any of the devices and Ethernet cables that configure the network can be checked. In addition, the operating status of a station set in the network parameters can be checked.	○	○	Page 148 "CC-Link IE TSN/CC-Link IE Field Diagnostics" window
	Selected Station Communication Status Monitor	<ul style="list-style-type: none">• Displays the module status and communication status of the selected station. If an error occurred in the module, this function displays diagnostic information such as the cause of the error and corrective action.• Detailed error definition of the selected station and corrective action for the error can be checked.	○	○	
	Data Unlinked	<ul style="list-style-type: none">• Displays a station with its setting existing in the network parameters but not displayed in the network map (a station that has never joined the network).• This function can check the non-existence of a station set in the network parameter.	○	○	

Function type	Function	Description	Connection destination of engineering tool		Reference
			Master station	Local station	
Operation test/execution function	Communication Test	<ul style="list-style-type: none"> This test specifies the network number and station number or the IP address to check whether transient transmission can be performed from the connected station (own station) to the communication destination. Transient transmission to the specified communication destination can be checked. In addition, when the communication destination is a station on another network, this test can check the relay stations that are passed through until transient transmission arrives from the connected station (own station) at the communication destination. 	<input type="radio"/>	<input type="radio"/>	Page 152 Communication test
Remote Operation		This function can remotely operate (RUN, STOP, and RESET) the FX5 CPU module and slave module.	\triangle^*1	\triangle^*1	Page 153 Remote operation

*1 If the setting on the "Specify Connection Destination Connection" window of the engineering tool is as follows, remote operation cannot be executed with "All Stations Specified".

Connection via Ethernet with the selections "Ethernet Board" for the personal computer-side I/F and "CC IE TSN/Field Module" for the programmable controller-side I/F

Restriction

When starting the CC-Link IE TSN/CC-Link IE Field diagnostics by specifying "Other Station (Single Network)" or "Other Station (Co-existence Network)" in "Other Station Setting" on the "Specify Connection Destination Connection" window, the following restrictions apply.

- A communication test cannot be used.
- If MELSECNET/H, multidrop connection of serial communication modules, an interface board for a personal computer, or network modules of the MELSEC-Q/L series are included in the communication path, diagnostics cannot start.

Usage methods

The following describes how to use the CC-Link IE TSN/CC-Link IE Field diagnostics.

1. Connect the engineering tool to the FX5 CPU module.

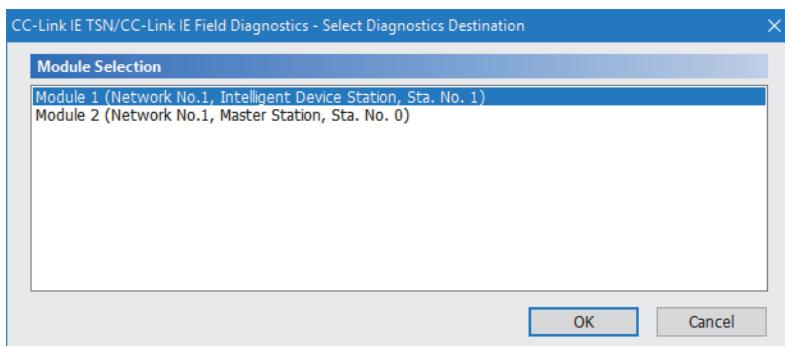
If a slave station cannot be monitored due to an error such as Ethernet cable disconnection, directly connect the engineering tool to the slave station.

2. Start the CC-Link IE TSN/CC-Link IE Field diagnostics.

→ [Diagnostics] ⇒ [CC-Link IE TSN/CC-Link IE Field Diagnostics]

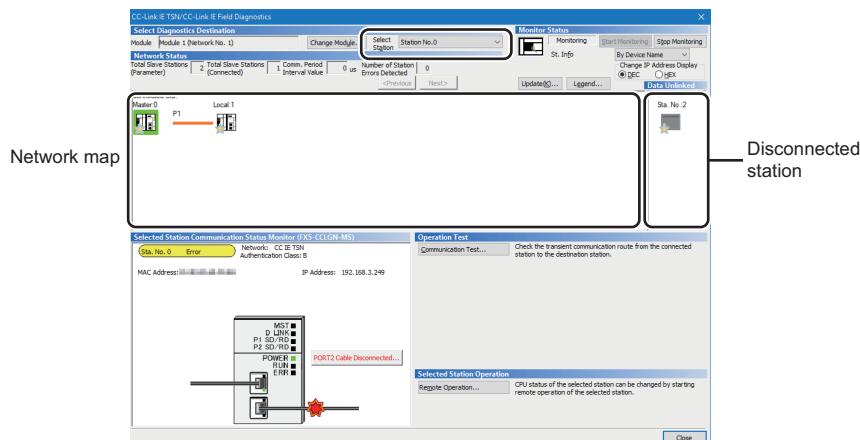
3. When the following window opens, select the FX5-CCLGN-MS to be diagnosed and click the [OK] button to start the CC-Link IE TSN/CC-Link IE Field diagnostics.

Modules are listed in the order configured in module information.



When two FX5-CCLGN-MSs with the same network number are mounted on the FX5 CPU module, the FX5-CCLGN-MS which is closer to the FX5 CPU module is always diagnosed, regardless of setting.

4. Select the station to be diagnosed from "Select Station" or in the network map.



- An icon indicating an error is displayed on the module icon of the station where an error occurs.
- A disconnected station that has performed data link is indicated with the "Disconnected Station" icon in the network map. However, a disconnected station in following case is displayed on the right end of the area.

Stations displayed on the right end of the area.

- A station that was reconnected to a network after disconnecting/inserting the Ethernet cable or powering off and on the system, and remains disconnected
- A disconnected station with the station icon deleted in the network map by clicking the [Update] button
- The "Error" icon is displayed on the icon of a cable where a communication error occurs. To check the details of the communication error, click the neighboring stations of the "Error" icon.



When the station to be diagnosed cannot be selected, the status of network number mismatch or duplication of master stations cannot be checked using the CC-Link TSN/CC-Link IE Field diagnostics. Connect the engineering tool directly to the station where the error has occurred, and check the error details on the "System Monitor" window.

5. The status of a station selected in "Network Status" is displayed in "Selected Station Communication Status Monitor".

(☞ Page 148 "CC-Link IE TSN/CC-Link IE Field Diagnostics" window)

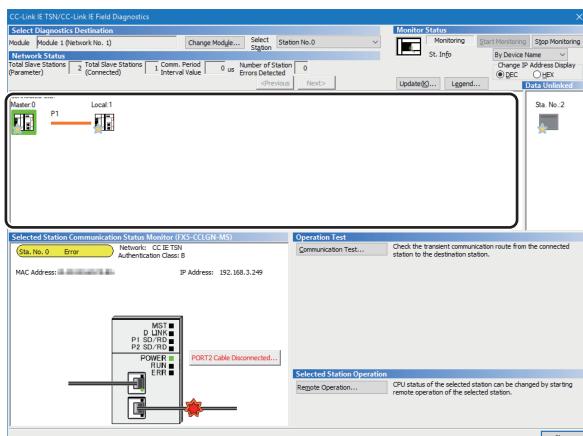
The station status is displayed on the top of "Selected Station Communication Status Monitor".

If an error occurs, a button indicating the error such as [PORT2 Communication Error] is displayed in "Selected Station Communication Status Monitor". Click the button to check the error details and actions.

6. Various tests and operations can be performed by clicking the "Operation Test" or "Selected Station Operation" on the bottom left of the window. (☞ Page 152 Communication test, Page 153 Remote operation)

"CC-Link IE TSN/CC-Link IE Field Diagnostics" window

Network map



Item		Description
Select Diagnostics Destination	Module	The FX5-CCLGN-MS under diagnostics is displayed.
	[Change Module] button	Allows to change the target FX5-CCLGN-MS when multiple FX5-CCLGN-MSs are mounted. When two FX5-CCLGN-MSs with the same network number are mounted on the FX5 CPU module, the FX5-CCLGN-MS which is closer to the FX5 CPU module is always diagnosed, regardless of setting.
	Select Station	Selects the station number of the station to be diagnosed. A station to be diagnosed can also be selected by clicking the module icon displayed in the network map.
Monitor Status	[Start Monitoring] button	Starts monitoring the CC-Link IE TSN/CC-Link IE Field diagnostics.
	[Stop Monitoring] button	Stops monitoring the CC-Link IE TSN/CC-Link IE Field diagnostics.
[Update] button		If the actual network configuration and network map of the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window are inconsistent, the network map update is executed so they are matched. A data link error may momentarily occur in all the stations and outputs of the connected slave stations may turn off since all stations on the network will be reconnected when executing the network map update. Set output data if needed.
[Legend] button		Displays the meaning of icons displayed in the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window.
St. Info		The display name of the slave station can be selected from "By Device Name", "By Station Type", "By Model Name", or "By IP Address". (Default: "By Device Name") "By Device Name" displays the information entered in "Alias" of "Network Configuration Settings" under "Basic Settings". The station type is displayed when the "Alias" is not entered.
Network Status	Total Slave Stations (Parameter)	Displays the total number of slave stations set in "Network Configuration Settings" under "Basic Settings".
	Total Slave Stations (Connected)	Stores the total number of slave stations (number of slave stations) that are actually connected by data link in the CC-Link IE TSN.
	Communication Cycle Interval Setting value	The communication cycle interval set in "Communication Period Setting" under "Basic Settings" of the master station is displayed. (μs unit)
	Number of Station Errors Detected	Indicates the number of error stations in the displayed network.
	Change IP Address Display	Allows to select from "DEC" or "HEX" for IP address display on the selected communication status monitor and network map. (Default: Decimal)
	Network map	Indicates the CC-Link IE TSN structure and the status of each station. (Page 149 Network map)
	Data Unlinked	Displays a disconnected station that has been set in "Network Configuration Settings" under "Basic Settings" but has not yet performed data link. Reserved stations or error invalid stations are also included.
Selected Station Communication Status Monitor		Displays status of the station selected in "Network Status". (Page 151 Selected Station Communication Status Monitor)
Operation Test	[Communication Test] button	Performs a communication test. (Page 152 Communication test)
Selected Station Operation	[Remote Operation] button	Performs remote operations (such as RUN, STOP, and RESET operations) on the FX5 CPU module. (Page 143 Module communication test)

Network map

Icon

The module type and station number are displayed with an icon.



- Click: Selection
- Right-click: Executes tests or debugging.
- **↑ ↓ ← →** keys on the keyboard: Move the focus to the module to be diagnosed, and determine it with the **Space** key.

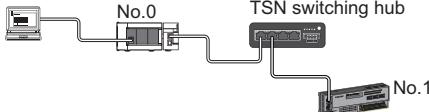
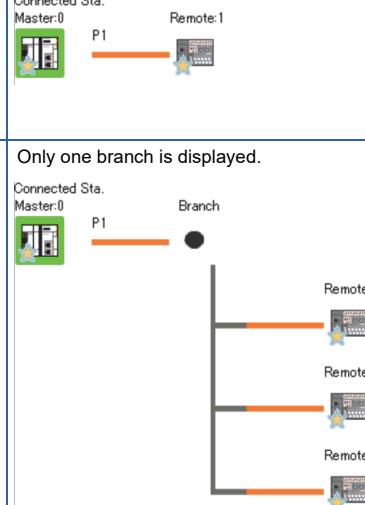
No.	Description
(1)	Displays the station (own station) where the engineering tool is connected.
(2)	Displays the station type and station number. "?" is displayed when a station number has not been set. When the background of the text is colored, the relevant station may have been set as a reserved station or an error invalid station. Click the [Legend] button to check the meaning of the background colors.
(3)	Module status is displayed. Click the [Legend] button to check the meaning of the icon. When the "Error (Illegal ring connection detected)" icon is displayed, take actions displayed in "Troubleshooting" of "Error details". (☞ Page 151) When a station where an error has occurred is selected
(4)	P1 or P2 to which an Ethernet cable is connected is displayed.

Network map

A network map is displayed according to the connection status.

Connection status	Display of the network map
Line topology	<p>Connected Sta. Master:0</p> <p>Local:1</p> <p>Remote:2</p> <p>P1</p>
Star topology	<p>Connected Sta. Master:0</p> <p>Branch</p> <p>No.0</p> <p>TSN switching hub</p> <p>No.1</p> <p>No.2</p> <p>P1</p>
Coexistence of line and star topologies	<p>Connected Sta. Master:0</p> <p>Branch</p> <p>P2</p> <p>P1</p> <p>No.0</p> <p>TSN switching hub</p> <p>No.1</p> <p>No.2</p> <p>No.3</p> <p>No.4</p> <p>Local:1</p> <p>Remote:1</p> <p>Remote:2</p> <p>Remote:3</p> <p>Remote:4</p>

In the following cases, the network map is displayed differently from the actual connection status.

Connection status	Display of the network map												
Two stations are connected through a switching hub.	Branches are not displayed in the network map.  <table><tr><td>Connected Sta.</td><td></td></tr><tr><td>Master:0</td><td>P1</td></tr><tr><td>Remote:1</td><td></td></tr></table>	Connected Sta.		Master:0	P1	Remote:1							
Connected Sta.													
Master:0	P1												
Remote:1													
Switching hubs are in cascade connection.	Only one branch is displayed.  <table><tr><td>Connected Sta.</td><td></td></tr><tr><td>Master:0</td><td>P1</td></tr><tr><td>Branch</td><td></td></tr><tr><td>Remote:3</td><td></td></tr><tr><td>Remote:2</td><td></td></tr><tr><td>Remote:1</td><td></td></tr></table>	Connected Sta.		Master:0	P1	Branch		Remote:3		Remote:2		Remote:1	
Connected Sta.													
Master:0	P1												
Branch													
Remote:3													
Remote:2													
Remote:1													

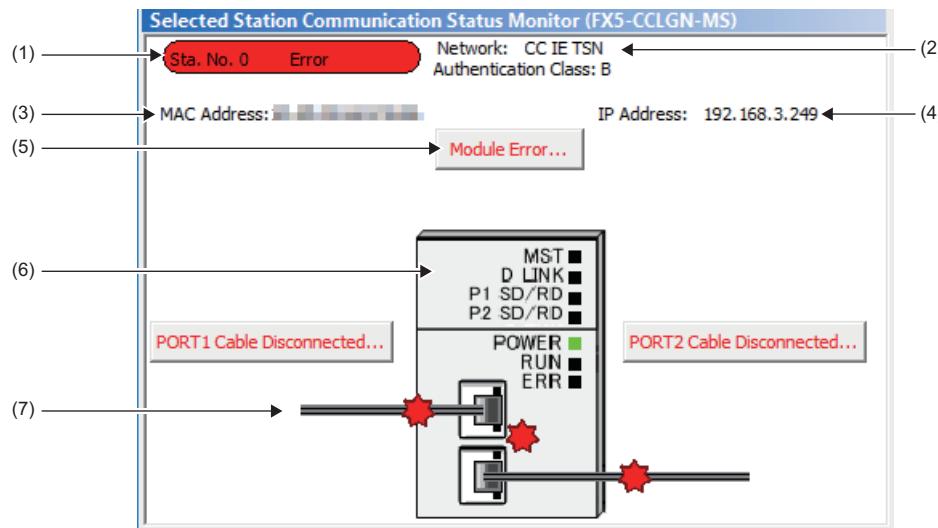
Precautions

Stations in offline mode are not displayed in the network map. In line topology, stations connected after a station in offline mode are not displayed because they are disconnected.

Selected Station Communication Status Monitor

Status of the station selected in "Network Status" is displayed.

When a station where an error has occurred is selected



No.	Description
(1)	Indicates the station number and operating status. <ul style="list-style-type: none"> Station number No error (light blue): Normal operation Station number Error (yellow): Error (Data link is continued) Station number Error (red): Error (Data link is stopped)
(2)	Displays the network type.
(3)	Displays a MAC address.*1
(4)	Displays an IP address.
(5)	Click this button to check error details. Take actions according to the description displayed in "Error Factor" and "Troubleshooting".
(6)	The LED status of a module and communication status of P1 and P2 is displayed. (参照 Page 19 LED indication)
(7)	Status of the Ethernet cables connected to P1 and P2 is displayed.

*1 When 00-00-00-00-00-00 is displayed as a MAC address, the status of the selected station cannot be checked with the selected station communication status monitor. Connect the engineering tool directly to the station where the error has occurred, and check the error details on the "System Monitor" window.

When a selected station is not available for communication status monitor

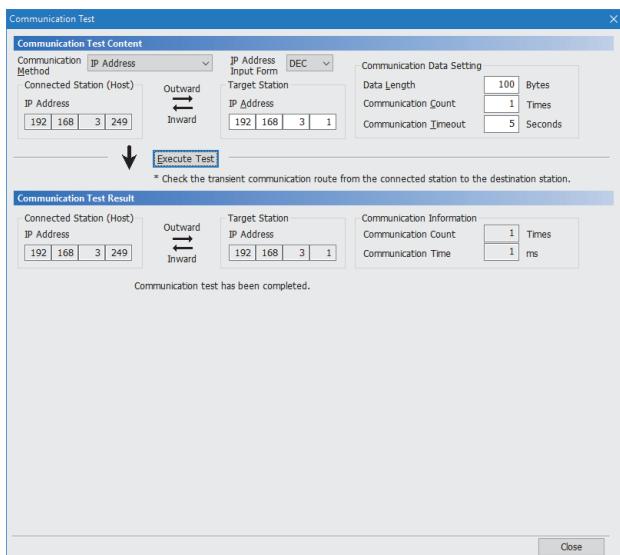
The information of devices are not displayed. The "Error details" window (detailed information, error factor, troubleshooting) is displayed.

Communication test

This function checks if transient transmission data can be properly routed from the own station to the communication target. Depending on selection for "Communication Method" ("Network No./Station No." or "IP Address"), the range that can be checked may vary.

Selection of "Communication Method"	Communication target of transient transmission	
	Stations on the same network	Stations on the other network
Network No./Station No.	<input type="radio"/> Available for check	<input checked="" type="radio"/> Not available for check
IP Address	<input type="radio"/> Available for check	<input checked="" type="radio"/> Not available for check

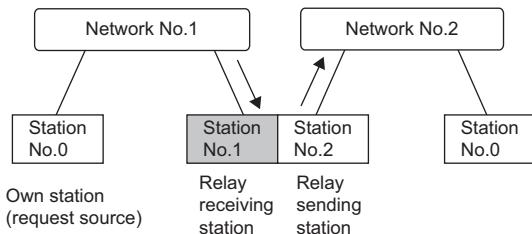
The following explains the procedure for a communication test.



1. Display the "Communication Test" window and select "Network No./Station No." or "IP Address" from "Communication Method".
[Diagnostics] ⇒ [CC-Link IE TSN/CC-Link IE Field Diagnostics] ⇒ [Communication Test] button
2. Enter values for "Target Station" and "Communication Data Setting".
3. Click the [Execute Test] button to execute the communication test. If an error occurs, take corrective actions according to the error message.

Precautions

- When a relay sending station is set to "Target Station", the communication test ends with an error. Set a relay receiving station to "Target Station".



- When "Network No./Station No." is selected for "Communication Method" and a station mounted on the same system (module connected with a connector or cable) is set for "Target Station", the communication test ends with an error.
- This test cannot check whether transient transmission can be performed from the connected station (own station) to a station on another network by specifying an IP address.
- Since this function uses PING, a communication test target station communication error (error code D919H) occurs if the communication target does not respond to PING. When executing this function, check if the security setting (such as firewall) of the communication target is set to respond to PING. Moreover, if the target is set not to respond to PING in the security settings (such as a firewall), it may take some time until a timeout error occurs on the engineering tool. For details on when communication of the engineering tool is not allowed in the firewall settings of Windows, refer to the following.

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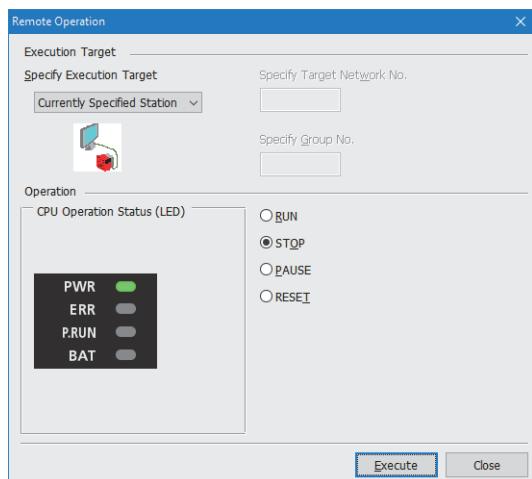
Remote operation

This function executes remote operations (such as RUN, STOP, and RESET operations) to the station selected on the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window, from the engineering tool. (Remote operation for slave stations is available only for RESET.)

The displayed window varies depending on the station selected. For the operations with a module other than the FX5-CCLGN-MS selected, refer to the manual for the module used.

Procedure

To perform remote operations, follow the steps below.



1. Select the module where the remote operations are performed in the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window.
2. Click the [Remote Operation] button in the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window, or right-click a module icon in the "Network Status" and click [Remote Operation].
The "Remote Operation" window is displayed.
3. Specify "Current Specified Station" in "Specify Execution Target".
The remote operations are performed only to the CPU module on the station selected in the CC-Link IE TSN/CC-Link IE Field diagnostics.
4. Select a remote operation (RUN, STOP, PAUSE, or RESET) to be performed in "Operation" to the CPU module.*1
5. Click the [Execute] button to perform the remote operation.

*1 To perform remote RESET, set "Remote Reset Setting" under "Operation Related Setting" of "CPU Parameter" to "Enable" in advance.



For details on the remote operations, refer to the user's manual for the CPU module used.

10.4 Troubleshooting by Symptom

This section describes troubleshooting by symptom. Perform the troubleshooting by symptom when a data link cannot be performed with the target station even though no error occurs in the FX5-CCLGN-MS. If an error has occurred in the FX5-CCLGN-MS, identify the error cause using the engineering tool. (☞ Page 144 Checking the Network Status)

When cyclic transmission cannot be performed

The following table lists the actions to be taken if cyclic transmission cannot be performed to the master station.

Check item	Action	
Is the D LINK LED of the FX5-CCLGN-MS turned on?	Perform troubleshooting for when the D LINK LED turns off or is flashing. (☞ Page 139 When the D LINK LED turns off or is flashing)	
Do the station types set in "Network Configuration Settings" of the master station match those set for the connected slave stations?	<ul style="list-style-type: none">Check 'Station type match status of each station' (SB00E8) and 'Station type match status' (SW00E8 to SW00EF) to correct the station type of stations in which the station type does not match.Correct that "Network Configuration Settings" of the master station and the actual system configuration match.	
When "Connection Device Information" is set to "Authentication Class B Only", is a dedicated TSN switching hub used?	<p>Correct the switching hub and the switching hub settings. For the setting method, refer to the manual for the switching hub used.</p> <ul style="list-style-type: none">When using a TSN switching hub, check the precautions and restrictions for system configuration on the CC-Link Partner Association website. (www.cc-link.org)Correct the switching hub delay time according to the switching hub used. (☞ Page 215 Communication cycle intervals) For the switching hub delay time of the switching hub used, contact the manufacturer.	
Does the IP filter setting mistakenly block communications from the IP address of another station?	Change the IP filter setting parameter to allow communication for the IP address of another station.	
The connection device information of the master station is set to "Authentication Class B Only".	Are authentication Class A devices connected?	Disconnect the authentication Class A devices.
	Is a general-purpose switching hub connected between authentication Class B devices?	Check the connected device and disconnect the general-purpose switching hub or replace it with a TSN switching hub.
	Are nine or more authentication Class B devices connected to each port of the master station?	Reduce the number of authentication Class B devices to eight or less for each port of the master station.
	Are any authentication Class B devices other than the master station connected in star topology?	Other than the master station, do not connect authentication Class B devices to a general-purpose switching hub in star topology.
	Is a general-purpose switching hub connected between authentication Class B devices?	Check the connected device and connect the master station to authentication Class B devices in line topology instead of using a general-purpose switching hub.
	Is an Ethernet device connected to a place other than the end of the network?	Check the connected device and connect the Ethernet device at the end of the network.
When the station is connected in line topology, is the communication speed setting matched among stations?	Is a general-purpose switching hub other than the NZ2EHG-T8(N) and DT135TX used?	Use the NZ2EHG-T8(N) or DT135TX.
		Correct "Communication Speed" under "Application Settings" so that the communication speed is matched for each station.
Is there any reason on the slave station side why cyclic communication is not performed?	<ul style="list-style-type: none">Check if an error has occurred on the slave station.Check if the slave station settings and parameters are correct.Refer to the manual of the slave station for troubleshooting.	
Is the event code 00C44 registered in the event history?	Set the same communication speed for the master station and the slave station parameter automatic setting target station.	
In multicast mode, is the authentication Class A remote station connected to the master station, remote station, or authentication Class A local station?	<ul style="list-style-type: none">Check the connected device and connect the authentication Class A remote station to the authentication Class B local station.Set unicast mode.	
In multicast mode, are a local station and an authentication Class A remote station connected on the end side via a switching hub?	<ul style="list-style-type: none">Check the connected device and do not connect a local station and an authentication Class A remote station on the end side via the switching hub.Set unicast mode.	
Is a device number outside the setting range set for a link side device in "Refresh Setting"?	Check that the device numbers of RX and RWr set in "Refresh Setting" are within the applicable range.	

If the above actions do not solve the problem, perform the module communication test to check for hardware failure. (☞ Page 143 Module communication test)

When transient transmission cannot be performed

The following lists the actions to be taken if transient transmission cannot be performed with the target station, and the engineering tool cannot perform monitoring.

Check item	Action
Is the D LINK LED of the FX5-CCLGN-MS flashing or turned on?	Perform troubleshooting to be performed when the D LINK LED turns off. (☞ Page 139 When the D LINK LED turns off or is flashing)
Is the data link status of the target station normal?	In the CC-Link IE TSN/CC-Link IE Field diagnostics, identify the cause of the error and take action. (☞ Page 144 Checking the Network Status)
Are the following data set correctly when a module FB or dedicated instruction is executed? <ul style="list-style-type: none"> • Target station CPU type • Target network number • Target station number 	Correct the section where the module FB or dedicated instruction is executed in the program.
Is the network number duplicated on the network?	Correct the parameter so that duplication does not occur among network numbers.
Are multiple link dedicated instructions with the same channel setting executed simultaneously?	<ul style="list-style-type: none"> • Set a different channel to each instruction. • Shift the execution timing of the link dedicated instructions.
Does the IP filter setting mistakenly block communications from the IP address of another station?	Change the IP filter setting parameter to allow communication for the IP address of another station.
The connection device information of the master station is set to "Authentication Class B Only".	Are authentication Class A devices connected?
	Is a general-purpose switching hub connected?
The connection device information of the master station is set to "Mixture of Authentication Class B/A or Authentication Class A Only".	Are nine or more authentication Class B devices connected to each port of the master station?
	Are any authentication Class B devices other than the master station connected in star topology?
	Is a general-purpose switching hub connected between authentication Class B devices?
	Is an Ethernet device connected to a place other than the end of the network?
	Is a general-purpose switching hub other than the NZ2EHG-T8(N) and DT135TX used?
When the station is connected in line topology, is the communication speed setting matched among stations?	Correct "Communication Speed" under "Application Settings" so that the communication speed is matched for each station.
Is there any reason on the slave station side why cyclic communication is not performed?	<ul style="list-style-type: none"> • Check if an error has occurred on the slave station. • Check if the slave station settings and parameters are correct. • Refer to the manual of the slave station for troubleshooting.
Is the event code 00C44 registered in the event history?	Set the same communication speed for the master station and the slave station parameter automatic setting target station.
In multicast mode, is the authentication Class A remote station connected to the master station, remote station, or authentication Class A local station?	<ul style="list-style-type: none"> • Check the connected device and connect the authentication Class A remote station to the authentication Class B local station. • Set unicast mode.
In multicast mode, are a local station and an authentication Class A remote station connected on the end side via a switching hub?	<ul style="list-style-type: none"> • Check the connected device and do not connect a local station and an authentication Class A remote station on the end side via the switching hub. • Set unicast mode.

If the above actions do not solve the problem, perform the following tests to check for an error.

- Communication test (☞ Page 152 Communication test)
- Module communication test (☞ Page 143 Module communication test)

When a station is disconnected from the network

The following is the action to be taken when a station in data link is disconnected.

Check item	Action
Is the ambient temperature for the module outside the specified range?	Keep the ambient temperature within the specified range by taking action such as removing heat source.

If the above action does not solve the problem, perform the module communication test to check for hardware failure. (☞ Page 143 Module communication test)

When a station is repeatedly disconnected and reconnected

The following lists the actions to be taken when a station in data link is repeatedly disconnected and reconnected.

Check item	Action
Do the used Ethernet cables conform to the Ethernet standard?	If not, replace them with Ethernet cables that satisfy the Ethernet standard. (☞ Page 88 Ethernet cable)
Is the station-to-station distance 100m or less?	Change the station-to-station distance to 100m or less.
Does the cabling condition (bending radius) meet the specifications?	Refer to the manual for the Ethernet cable, and if the bending radius exceeds the specified range, correct the bending radius.
Is any Ethernet cable disconnected?	If an Ethernet cable is disconnected, replace the Ethernet cable.
Is the switching hub used in the system operating normally?	<ul style="list-style-type: none">Check that a switching hub that conforms to the standard is used. (☞ Page 88 Switching hub)Power off and on the switching hub.
Is the time synchronization source station operating normally?	Take action by referring to the manual for the module of the time synchronization source station.
Are resets of other stations repeated?	Avoid unnecessary reset since a station is disconnected while resetting.
Are other stations repeatedly powering on/off?	Avoid unnecessary power-off, since a station is disconnected while turned off.
When the communication speed of the master station is set to 1Gbps and an authentication Class B/A device with a communication speed of 100Mbps is used, is "Communication Period Setting" set to "Basic Period" or "Normal-Speed"?	For an authentication Class B/A device with a communication speed of 100Mbps, set "Communication Period Setting" to "Low-Speed".

If the above actions do not solve the problem, perform the module communication test to check for hardware failure. (☞ Page 143 Module communication test)

When communication is unstable

When cyclic transmission delay time is long or when a transient transmission timeout occurs, check the following items.

Check item	Action
Is the L ER LED of the FX5-CCLGN-MS turned on?	Perform troubleshooting to be performed when the L ER LED turns on. (☞ Page 140 When the L ER LED turns on)
Is the ambient temperature for the module outside the specified range?	Keep the ambient temperature within the specified range by taking action such as removing heat source.
Is any error shown in "Selected Station Communications Status Monitor" of CC-Link IE TSN/CC-Link IE Field diagnostics?	If an error occurs, perform a module communication test.
Is there any noise affecting the system?	Change the installation of the modules and wiring so that the system is not affected by noise.

If the above actions do not solve the problem, perform the module communication test to check for hardware failure. (☞ Page 143 Module communication test)

When communication with an SLMP-compatible device cannot be performed

When communication with an SLMP-compatible device cannot be performed, check the following items.

Check item	Action
Has the connection with the external device been opened normally?	<ul style="list-style-type: none"> If the connection with the external device is not opened, perform the open processing.*1 If an error occurs, check and eliminate the error cause.
Is the correct command format used for the command type, device specification, address specification, and others?	Correct the command to be sent.
Did the external device send a command?	If the external device did not send a command, send a command to this module.
Was a response returned to the device that had sent the command?	<ul style="list-style-type: none"> If no response was returned, check if the correct IP address was specified in the command. If not, correct the IP address and send the command again. If a response was returned, check the end and error codes to correct the faulty area.
Is the same communication speed set for the connected device and access destination?	Change the connection destination so that the connected station and the access destination have the same communication speed, and execute communication.
When communicating in multicast mode, is an Ethernet device connected to the master station, remote station, or authentication Class A local station?	<ul style="list-style-type: none"> Check the connected device and connect the Ethernet device to the authentication Class B local station. Set unicast mode. Take actions so that the Ethernet device does not receive multicast cyclic data.
In multicast mode, are a local station and an Ethernet device connected on the end side via a switching hub?	<ul style="list-style-type: none"> Check the connected device and do not connect a local station and a general Ethernet device on the end side via the switching hub. Set unicast mode. Take actions so that the Ethernet device does not receive multicast cyclic data.

*1 If the connection of only the external device is closed due to cable disconnection, personal computer restart, or other reasons, reopen the connection using the same port used before the error occurred. A connection is not closed if another Active open request is received from the external device with a different IP address or a port number.

If the above actions do not solve the problem, perform the module communication test to check for hardware failure. (☞

Page 143 Module communication test)

When the time synchronization does not operate for the control CPU of a local station

When the time synchronization does not operate for the control CPU of a local station, check the following items.

Check item	Action
Has the clock data been changed by the clock function of the CPU module?	Check the clock function of the CPU module to see if the clock data has been changed.

When communications with Ethernet devices cannot be performed

When communications (CC-Link IE TSN/CC-Link IE Field diagnostics, transient transmission, remote password, or communication test) with Ethernet devices cannot be performed, check the following items.

Check item	Action
Is the firewall or proxy server setting enabled on the Ethernet device?	Check and correct the firewall and proxy server settings on the Ethernet device such as checking if a response to the PING command (ICMP echo request) is disabled.
Is the antivirus software on the Ethernet device blocking the communication?	Check and correct the antivirus software settings on the Ethernet device. <ul style="list-style-type: none">Is the security setting level of the antivirus software low?Is a response to the PING command (ICMP echo request) disabled in the firewall settings?
When communicating in multicast mode, is an Ethernet device connected to the master station, remote station, or authentication Class A local station?	<ul style="list-style-type: none">Check the connected device and connect the Ethernet device to the authentication Class B local station.Set unicast mode.Take actions so that the Ethernet device does not receive multicast cyclic data.
In multicast mode, are a local station and an Ethernet device connected on the end side via a switching hub?	<ul style="list-style-type: none">Check the connected device and do not connect a local station and a general Ethernet device on the end side via the switching hub.Set unicast mode.Take actions so that the Ethernet device does not receive multicast cyclic data.



For details when communications of GX Works3 are not allowed in the firewall settings of Windows, refer to the following.

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If the above actions do not solve the problem, perform the module communication test to check for hardware failure. (Page 143 Module communication test)

When the link device cannot communicate although the data link is normal

When the link device cannot communicate although the data link is normal (D LINK LED is on), check the following items.

Check item	Action
Is "Reserved/Error Invalid Station" of the slave station set to "Reserved Station" in "Network Configuration Settings" of the master station?	Set "Reserved/Error Invalid Station" of the slave station to "No Setting".
Is the input/output bit setting or input/output word setting of the slave station set in "Network Configuration Settings" of the master station? (Simple display)	Set a link device used in the slave station correctly.
Are "RX Setting", "RY Setting", "RWw Setting", "RW _r Setting", "LB Setting", and "LW Setting" of the slave station set in "Network Configuration Settings" of the master station? (Detailed display)	Set a link device used in the slave station correctly.
Does the slave station support the link devices set in "Network Configuration Settings" of the master station?	Correct the link devices to be assigned to the slave station in "Network Configuration Settings" of the master station.
Is the link refresh setting range correct?	Correct the setting in "Refresh Settings" of "Basic Settings".
Is the refresh range of "CPU Side" in "Refresh Settings" duplicated with that of "CPU Side" of another network module?	Correct the setting in "Refresh Settings" of "Basic Settings".
Is the transfer range set in "Interlink Transmission Settings" correct?	Correct the transfer range set in "Interlink Transmission Settings".
Are the settings in "Transfer Source Module" and "Transfer Destination Module" of "Interlink Transmission Settings" correct?	Correct the settings in "Transfer Source Module" and "Transfer Destination Module" of "Interlink Transmission Settings".
When the local station cannot receive cyclic data from another station, is "Communication Mode" of the master station set to "Multicast"?	Set "Communication Mode" of the master station to "Multicast".

10.5 List of Error Codes

The following table lists the error codes, error definitions and causes, and actions for the errors that occur in the processing for data communication between the FX5-CCLGN-MS and external devices or occur by processing requests from the FX5 CPU module on the own station.

Error codes are displayed in the [Error Information] tab in the "Module Diagnostics" window of the FX5-CCLGN-MS. (☞
Page 141 Error Information)

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
1124H	<ul style="list-style-type: none"> The default gateway is not set correctly. The gateway IP address is not set correctly. The default gateway/gateway IP address (network address after the subnet mask) is different from that of the IP address of the own node. 	<ul style="list-style-type: none"> Correct the default gateway IP address. Set the same network address as that of the IP address. 	■Parameter information <ul style="list-style-type: none"> Parameter type Intelligent module No. Parameter No. Network No. Station No. ■—
1128H	The port number is incorrect.	Correct the port number.	—
1129H	System error	Please consult your local Mitsubishi representative.	—
112DH to 112EH	System error	Please consult your local Mitsubishi representative.	—
1134H	System error	Please consult your local Mitsubishi representative.	—
1152H	The IP address is not set correctly.	Correct the IP addresses.	■Parameter information <ul style="list-style-type: none"> Parameter type Intelligent module No. Parameter No. Network No. Station No. ■—
1155H	<ul style="list-style-type: none"> The specified connection was already closed in TCP/IP communications. Open processing is not performed. 	<ul style="list-style-type: none"> Perform the open processing for the specified connection. Check if the open processing has been performed in the external device. 	—
1157H	<ul style="list-style-type: none"> The specified connection was already closed in UDP/IP communications. Open processing is not performed. 	<ul style="list-style-type: none"> Perform the open processing for the specified connection. Check if the open processing has been performed in the external device. 	—
1158H	System error	Please consult your local Mitsubishi representative.	—
1166H	System error	Please consult your local Mitsubishi representative.	—
1167H	Unsent data found, but could not be sent.	<ul style="list-style-type: none"> Check the settings for connection with the external device. Check the operation of the external device or switching hub. Since there may be congestion of packets on the line, send data after a certain period of time. Check if the Ethernet cable is disconnected. Check that there is no connection failure with the switching hub. Execute the communication test, and if the test was completed with an error, take corrective action. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
1802H	During data link, overlapping IP addresses have been detected.	Change the IP address of devices with a duplicated IP address.	<ul style="list-style-type: none"> ■ Operation source information <ul style="list-style-type: none"> • IP address ■ IP address duplication information <ul style="list-style-type: none"> • Duplication station 1 MAC address (1st octet, 2nd octet) • Duplication station 1 MAC address (3rd octet, 4th octet) • Duplication station 1 MAC address (5th octet, 6th octet) • Duplication station 2 MAC address (1st octet, 2nd octet) • Duplication station 2 MAC address (3rd octet, 4th octet) • Duplication station 2 MAC address (5th octet, 6th octet)
1803H	Over the number of stations that can be connected.	Reduce the number of authentication Class B devices to eight or less for each port of the master station.	—
1804H	<p>During data link, invalid connection structure has been detected.</p> <ul style="list-style-type: none"> • An authentication Class B station is connected further on the end side than an authentication Class A station. • With the master station with a communication speed of 1Gbps, further on the end side than a station with a communication speed of 100Mbps, a station with "Communication Period Setting" not set to "Low-Speed" (? 16) and a communication speed of 1Gbps exists. • With the master station with a communication speed of 1Gbps, further on the end side than a station with a communication speed of 100Mbps, a station with a communication speed of 1Gbps is connected. • The communication speed of the master station and local station are not matched. <p>■ Multicast mode</p> <ul style="list-style-type: none"> • An authentication Class A local station is connected further on the end side than an authentication Class A remote station. • With the master station with a communication speed of 1Gbps, stations with a communication speed of 1Gbps and 100Mbps are connected on the end side via the switching hub. 	<p>Check the connection and setting on the end side of the station shown in detailed information 2 and take the following actions.</p> <ul style="list-style-type: none"> • Connect an authentication Class A station further on the end side than an authentication Class B station. • If the master station has a communication speed of 1Gbps, set "Communication Period Setting" to "Low-Speed" (? 16) for any station with a communication speed of 1Gbps located further on the end side than a station with a communication speed of 100Mbps. • If the master station has a communication speed of 1Gbps, connect the station with a communication speed of 1Gbps on the master station side rather than on the side where a station with a communication speed of 100Mbps is connected. • Set the same communication speed for the master station and local station. <p>■ Multicast mode</p> <ul style="list-style-type: none"> • Connect an authentication Class A remote station further on the end side than an authentication Class A local station. • If the master station has a communication speed of 1Gbps, do not connect a station with a communication speed of 1Gbps and 100Mbps on the end side via the switching hub. 	<ul style="list-style-type: none"> ■ Own station information <ul style="list-style-type: none"> • Intelligent module No. • Network No. • Station No. • IP address ■ Target station information <ul style="list-style-type: none"> • Network No. • Station No. • IP address

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
1805H	<ul style="list-style-type: none"> The total cyclic data size of all slave stations on the authentication Class A device side at the boundary between authentication Class B and authentication Class A exceeds 2K bytes. The total cyclic data size of all slave stations on the authentication Class A device side at the boundary between authentication Class B and authentication Class A exceeds 2K bytes. 	<p>Check the connection and setting on the end side of the station shown in detailed information 2 based on the error definition and cause and take the following actions.</p> <ul style="list-style-type: none"> Do not set the total cyclic data size of all slave stations on the authentication Class A device side at the boundary between authentication Class B and authentication Class A to exceed 2K bytes. Do not set the total cyclic data size of all slave stations on the side of the station with a communication speed of 100Mbps at the boundary between the station with a communication speed of 1Gbps and the station with a communication speed of 100Mbps to exceed 2K bytes. 	<ul style="list-style-type: none"> Own station information Intelligent module No. Network No. Station No. IP address Target station information Network No. Station No. IP address
1811H	A stop error has been detected in the CPU module.	Check the error of the CPU module in "Module Diagnostics" of the engineering tool and take action.	—
1830H	Number of reception requests of transient transmission (link dedicated instruction) exceeded the upper limit of simultaneously processable requests.	Lower the transient transmission usage frequency, and retry the operation.	—
1845H	Too much processing of transient transmission (link dedicated instruction) and cannot perform transient transmission.	Correct the transient transmission (link dedicated instruction) execution count.	—
1D01H	System error	Please consult your local Mitsubishi representative.	—
1D10H to 1D11H	System error	Please consult your local Mitsubishi representative.	—
1D20H	System error	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.	—
2160H	IP address duplication was detected.	Check the IP addresses.	—
2220H	The parameter setting is corrupted.	Check the detailed information of the error in "Module Diagnostics" of the engineering tool, and write the displayed parameter. If the same error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	<ul style="list-style-type: none"> Parameter information Parameter type
2221H	<ul style="list-style-type: none"> The set value is out of the range. Or the setting values of the master station and local stations are not consistent. Parameters that are not supported by the firmware version of the network module have been set. 	<ul style="list-style-type: none"> Check the detailed information of the error in "Module Diagnostics" of the engineering tool, and correct the parameter setting corresponding to the parameter number. Check the firmware version of the network module. If parameters that are not supported are set, update the firmware version or correct the parameters. 	<ul style="list-style-type: none"> Parameter information Parameter type Intelligent module No. Parameter No. Network No. Station No.
24C0H to 24C3H	System error	Please consult your local Mitsubishi representative.	—
24C6H	System error	Please consult your local Mitsubishi representative.	—
2600H	System error	Please consult your local Mitsubishi representative.	—
2610H	System error	Please consult your local Mitsubishi representative.	—
3000H	System error	Please consult your local Mitsubishi representative.	—
3009H	<p>The result when the value set in "Communication Period Interval Setting" in "Communication Period Setting" under "Basic Settings" of the master station is multiplied by "Communication Period Setting" of the slave station set in "Network Configuration Settings" under "Basic Settings" is out of the range.</p>	<p>Check the detailed information in "Module Diagnostics" of the engineering tool. Correct the parameter settings described below so that the result when the value set in "Communication Period Interval Setting" in "Communication Period Setting" under "Basic Settings" of the master station is multiplied by "Communication Period Setting" of the slave station set in "Network Configuration Settings" under "Basic Settings" becomes within 16ms.</p> <ul style="list-style-type: none"> "Communication Period Interval Setting" in "Basic Settings" "Communication Period Setting" of the relevant slave station in "Network Configuration Settings" <p>Set a value to "Communication Period Setting" of slave stations by selecting a multiple value on "Multiple Period Setting" of "Communication Period Setting" under "Basic Settings".</p>	<ul style="list-style-type: none"> — Target station information Station Number IP address

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
300AH	<ul style="list-style-type: none"> The combination of the local station firmware version and the master station firmware version is incorrect. The set value is out of the range. Or the setting values of the master station and local stations are not consistent. 	<ul style="list-style-type: none"> Check the firmware versions of the master station and local station. If the combination is incorrect, update the firmware version of the older local station or that of the master station. Check the detailed information of the error in "Module Diagnostics" of the engineering tool, and correct the parameter setting of the master station corresponding to the parameter number. If the same error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative. 	<ul style="list-style-type: none"> Parameter information <ul style="list-style-type: none"> Parameter type Intelligent module No. Parameter No. Network No. Station No.
300BH	The Announce frame send cycle parameter error was detected.	<ul style="list-style-type: none"> Check the Announce frame send cycle parameter setting value of the device operating as the grandmaster. When the FX5-CCLGN-MS is operating as the grandmaster, reset the CPU module, and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative. 	—
300CH	A propagation delay send cycle parameter error was detected.	<ul style="list-style-type: none"> Check the propagation delay send cycle parameter setting value of the device operating as the grandmaster. When the FX5-CCLGN-MS is operating as the grandmaster, reset the CPU module, and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative. 	—
300DH	The Sync frame send cycle parameter error was detected.	<ul style="list-style-type: none"> Check the Sync frame send cycle parameter setting value of the device operating as the grandmaster. When the FX5-CCLGN-MS is operating as the grandmaster, reset the CPU module, and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative. 	—
300EH	The set values of the master station and local station do not match.	Set the same parameter setting values for "Network No." and "Station No." of the local station to the setting values of the master station.	<ul style="list-style-type: none"> Parameter information <ul style="list-style-type: none"> Parameter type Intelligent module No. Parameter No. Network No. Station No.
300FH	Multiple master stations were detected in the network.	<ul style="list-style-type: none"> Connect only one master station on the same network. After taking the above action, power off and on or reset all stations where the error was detected. 	<ul style="list-style-type: none"> Parameter information <ul style="list-style-type: none"> Parameter type Intelligent module No. Parameter No. Overlapped type information <ul style="list-style-type: none"> 5: Master station duplication
3010H	The value set in "Communication Period Interval Setting" in "Communication Period Setting" under "Basic Settings" of the master station is smaller than the communication cycle interval calculated by the number of stations and points of slave stations that was set in "Network Configuration Settings" under "Basic Settings".	Set the value of "Communication Period Interval Setting" as a value equal to or larger than the value in the detailed information displayed in "Module Diagnostics" using "Communication Period Setting" under "Basic Settings" of the master station.	<ul style="list-style-type: none"> — Communication Period Interval Information <ul style="list-style-type: none"> Communication Period Interval (Calculation value: μs)
3011H	The value set in "Cyclic transmission time" in "Communication Period Setting" under "Basic Settings" of the master station is smaller than the cyclic transmission time calculated by the number of stations and points of slave stations set in "Network Configuration Settings" under "Basic Settings".	Set the value of "Cyclic Transmission Time" as a value equal to or larger than the value in the detailed information displayed in "Module Diagnostics" using "Communication Period Setting" under "Basic Settings" of the master station.	<ul style="list-style-type: none"> — Communication Period Interval Information <ul style="list-style-type: none"> Cyclic Transmission Time (Calculation value: μs)
3012H	System error	Please consult your local Mitsubishi representative.	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
3013H	The value set in "Transient Transmission Time" in "Communication Period Setting" under "Basic Settings" of the master station is smaller than the transient transmission time calculated using the number of slave stations and the points of slave stations set in "Network Configuration Settings" under "Basic Settings".	Set "Communication Period Interval Setting" and "Cyclic Transmission Time" so that the value of "Transient Transmission Time" in "Communication Period Setting" under "Basic Settings" of the master station is equal to or larger than the value shown in the detailed information displayed in "Module Diagnostics".	<ul style="list-style-type: none"> ■— ■Communication Period Interval Information <ul style="list-style-type: none"> • Transient Transmission Time (Calculation value: μs)
3014H	When "Communication Mode" under "Application Settings" of the master station is set to "Multicast", in the "Network Configuration Settings" of the "Basic Settings", "Communication Period Setting" of the local station is set to "Normal-Speed" or "Low-Speed".	<ul style="list-style-type: none"> • Set "Communication Mode" in "Application Settings" of the master station to "Unicast". • In "Network Configuration Settings" under "Basic Settings" of the master station, set "Communication Period Setting" of the local station to "Basic Period". 	<ul style="list-style-type: none"> ■Parameter information <ul style="list-style-type: none"> • Parameter type • Intelligent module No. • Parameter No. ■Target station information <ul style="list-style-type: none"> • Station Number • IP address
3015H	The value set in "Communication Period Interval Setting" in "Communication Period Setting" under "Basic Settings" of the master station is smaller than the communication cycle interval calculated by the number of stations and points of slave stations that was set in "Network Configuration Settings" under "Basic Settings".	Set the value of "Communication Period Interval Setting" as a value equal to or larger than the value of "Communication Period Interval (Calculation value)" (SW0072) of a local station using "Communication Period Setting" under "Basic Settings" of the master station. (☞ Page 215 Communication cycle intervals)	—
3016H	System error	Please consult your local Mitsubishi representative.	—
3017H	The value set in "Cyclic transmission time" in "Communication Period Setting" under "Basic Settings" of the master station is smaller than the cyclic transmission time calculated by the number of stations and points of slave stations set in "Network Configuration Settings" under "Basic Settings".	Set the value of "Cyclic Transmission Time" as a value equal to or larger than the value of "Cyclic Transmission Time (Calculation value)" (SW0073) of a local station using "Communication Period Setting" under "Basic Settings" of the master station. (☞ Page 215 Communication cycle intervals)	—
3018H	The value set in "Transient Transmission Time" in "Communication Period Setting" under "Basic Settings" of the master station is smaller than the transient transmission time calculated using the number of slave stations and the points of slave stations set in "Network Configuration Settings" under "Basic Settings".	Set "Communication Period Interval Setting" and "Cyclic Transmission Time" so that the value of "Transient Transmission Time" in "Communication Period Setting" under "Basic Settings" of the master station is equal to or larger than the value of "Transient Transmission Time (Calculation value)" (SW0078) of a local station. (☞ Page 215 Communication cycle intervals)	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
3021H	At startup of data link, IP address duplication among slave stations has been detected.	Correct the IP addresses of the slave stations.	<ul style="list-style-type: none"> ■ Operation source information <ul style="list-style-type: none"> • IP address ■ IP address duplication information <ul style="list-style-type: none"> • Duplication station 1 MAC address (1st octet, 2nd octet) • Duplication station 1 MAC address (3rd octet, 4th octet) • Duplication station 1 MAC address (5th octet, 6th octet) • Duplication station 2 MAC address (1st octet, 2nd octet) • Duplication station 2 MAC address (3rd octet, 4th octet) • Duplication station 2 MAC address (5th octet, 6th octet)
3040H to 3042H	System error	Please consult your local Mitsubishi representative.	—
3060H	The send/receive data size exceeds the allowable range.	<ul style="list-style-type: none"> • Check and change the send data size of the Ethernet-equipped module or the external device. • If the same 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. 	—
3110H to 3111H	System error	Please consult your local Mitsubishi representative.	—
3120H	System error	Please consult your local Mitsubishi representative.	—
3121H	The cyclic transmission setting information received from the master station exceeds the setting range.	Write the module parameter to the CPU module again. If the same error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
3130H	Devices with time synchronization priority of 0 to 15 have been connected.	Remove devices with time synchronization priority of 0 to 15, or change the priority to between 16 and 255.	—
3135H	Over the number of stations that can be connected.	Reduce the number of authentication Class B devices to eight or less for each port of the master station.	—
3136H	An illegal ring topology was detected.	Set a line topology or star topology, and turn off and on or reset all stations.	—
3600H	Response data of the dedicated instruction cannot be created.	<ul style="list-style-type: none"> • 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. 	—
3601H to 3603H	System error	Please consult your local Mitsubishi representative.	—
3607H to 360DH	System error	Please consult your local Mitsubishi representative.	—
3C00H	A hardware failure has been detected.	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module, and run it again. If the same error occurs again even after taking the above, the possible cause is a hardware failure of the module or extension cable. Please consult your local Mitsubishi representative. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
3C01H	A hardware failure has been detected.	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module, and run it again. If the same error occurs again even after taking the above, the possible cause is a hardware failure of the module or extension cable. Please consult your local Mitsubishi representative. 	—
3C02H	A hardware failure has been detected.	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module, and run it again. If the same error occurs again even after taking the above, the possible cause is a hardware failure of the module or extension cable. Please consult your local Mitsubishi representative. 	—
3C0FH	A hardware failure has been detected.	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module, and run it again. If the same error occurs again even after taking the above, the possible cause is a hardware failure of the module or extension cable. Please consult your local Mitsubishi representative. 	—
3C10H	A hardware failure has been detected.	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module, and run it again. If the same error occurs again even after taking the above, the possible cause is a hardware failure of the module or extension cable. Please consult your local Mitsubishi representative. 	—
3C13H	A hardware failure has been detected.	Reset the CPU module, and run it again. If the same error occurs again even after doing so, the possible cause is a hardware failure of the error module or CPU module. Please consult your local Mitsubishi representative.	—
3C14H	A hardware failure has been detected.	Reset the CPU module, and run it again. If the same error occurs again even after doing so, the possible cause is a hardware failure of the error module or CPU module. Please consult your local Mitsubishi representative.	—
3C2FH	An error was detected in the memory.	Reset the CPU module, and run it again. If the same 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 same 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.	—
3E02H	A time synchronization error was detected.	Reset the CPU module, and run it again. If the same error occurs again even after doing so, the possible cause is a hardware failure of the error module or CPU module. Please consult your local Mitsubishi representative.	—
3E03H	An error was detected in the memory.	Reset the CPU module, and run it again. If the same error occurs again even after doing so, the possible cause is a hardware failure of the error module or CPU module. Please consult your local Mitsubishi representative.	—
3E04H	A hardware failure has been detected.	Reset the CPU module, and run it again. If the same error occurs again even after doing so, the possible cause is a hardware failure of the error module or CPU module. Please consult your local Mitsubishi representative.	—
4000H to 4FFFH	Errors detected by the CPU module (User's Manual for the module used)		
C011H	The port number of the external device is not set correctly.	Correct the port number of the external device.	—
C012H	The port number used in a connection already opened is set. (For TCP/IP)	Correct the port numbers of the Ethernet-equipped module and the external device.	—
C013H	The port number used in a connection already opened is set. (For UDP/IP)	Correct the port numbers of the Ethernet-equipped module and the external device.	—
C015H	The data was sent to the connected device while the IP address setting of the device set in the network configuration setting was incorrect.	<ul style="list-style-type: none"> Correct the IP address of the connected device in the network configuration setting. Check that the IP address class of the connected device is set to A, B, or C in the network configuration setting. 	—
C017H	A connection could not be established in the open processing.	<ul style="list-style-type: none"> Check the operation of the external device. Check if the open processing has been performed in the external device. When a firewall is set in the external device, check if access is permitted. Check if the Ethernet cable is disconnected. 	—
C018H	The specified IP address of the external device is incorrect.	Correct the specified IP address of the external device.	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
C032H	The external device does not send an ACK response in the TCP/IP communications.	<ul style="list-style-type: none"> Since there may be congestion of packets on the line, send data after a certain period of time. Check if the Ethernet cable is disconnected. 	—
C035H	The alive status of an external device could not be checked.	<ul style="list-style-type: none"> Check the operation of the external device. Check if the Ethernet cable is disconnected. 	—
C037H	<ul style="list-style-type: none"> The receive buffer or send buffer is not sufficient. The window size of the external device is not sufficient. 	<ul style="list-style-type: none"> Check the operation of the external device or switching hub. When the value of the 'Receive Buffer Status Storage Area' (Un(G68126) is 0001H, reduce the reception frequency of data from the external device. 	—
C038H	Data was not sent correctly with UDP/IP.	<ul style="list-style-type: none"> Check the settings for connection with the external device (including a switching hub) and the operation of the external device (error or during resetting). Check that there is no connection failure (if the Ethernet cable is disconnected). Since there may be congestion of packets on the line, send data after a certain period of time. Execute the PING test and communication status test, and if the test was completed with an error, take the corrective action. Correct the network number and station number/IP address of the target station of the dedicated instruction. 	—
C039H	Data was not sent correctly with TCP/IP.	<ul style="list-style-type: none"> Check the settings for connection with the external device (including a switching hub) and the operation of the external device (error or during resetting). Check that there is no connection failure (if the Ethernet cable is disconnected). Since there may be congestion of packets on the line, send data after a certain period of time. Execute the PING test and communication status test, and if the test was completed with an error, take the corrective action. 	—
C040H	<ul style="list-style-type: none"> Sufficient data for the data length could not be received. The remaining part of the message divided at the TCP/IP level could not be received. 	<ul style="list-style-type: none"> Correct the data length of the communication data. Since there may be congestion of packets on the line, send the data again from the external device after a random amount of time has passed. 	—
C050H	ASCII code data that cannot be converted to binary code was received.	Check if the ASCII code data that cannot be converted into binary code data was sent from the external device.	—
C051H	<ul style="list-style-type: none"> The number of read/write points from/to the device of SLMP message is out of the allowable range in the CPU module (in units of words). The number of write points for the long counter of SLMP message is not in two-word units. 	Correct the number of read/write points and send the SLMP message to the Ethernet-equipped module again.	—
C052H	The number of read/write points from/to the device of SLMP message is out of the allowable range in the CPU module (in units of bits).	Correct the number of read/write points and send the SLMP message to the Ethernet-equipped module again.	—
C053H	The number of read/write points from/to the random device of SLMP message is out of the allowable range in the CPU module (in units of bits).	Correct the number of read/write points and send the SLMP message to the Ethernet-equipped module again.	—
C054H	The number of read/write points from/to the random device of SLMP message is out of the allowable range in the CPU module (in units of words, double words).	Correct the number of read/write points and send the SLMP message to the Ethernet-equipped module again.	—
C055H	The read/write size from/to the file data of SLMP message is out of the allowable range.	Correct the read/write size and send the SLMP message to the Ethernet-equipped module again.	—
C056H	The read/write request exceeds the largest address.	<ul style="list-style-type: none"> Correct the start address or the number of read/write points so that the request does not exceed the largest address and send the data to the Ethernet-equipped module again. If the access target and connection stations are modules of the MELSEC iQ-R series, send the SLMP message again to the Ethernet-equipped module using 00□3 and 00□2 of subcommands. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
C057H	The request data length of the SLMP message does not match the number of data in the character (a part of text).	Check and correct the text or request data length, and send the SLMP message to the Ethernet-equipped module again.	—
C058H	The request data length of the SLMP message after the ASCII/binary conversion does not match with the number of data in the character (a part of text).	Check and correct the text or request data length, and send the SLMP message to the Ethernet-equipped module again.	—
C059H	<ul style="list-style-type: none"> The specified command and subcommand of the SLMP message are incorrect A function that is not supported by the target device was executed. 	<ul style="list-style-type: none"> Check that there are no errors in the specification of the command and subcommand of the SLMP message. Check whether the function executed is supported by the target device. Check the version of the target device. 	—
C05AH	The Ethernet-equipped module cannot read/write data from/to the device specified by the SLMP message.	Correct the specification of the device to be read/written and send the SLMP message to the Ethernet-equipped module again.	—
C05BH	The Ethernet-equipped module cannot read/write data from/to the device specified by the SLMP message.	Correct the specification of the device to be read/written and send the SLMP message to the Ethernet-equipped module again.	—
C05CH	<ul style="list-style-type: none"> The received request data of the SLMP message is incorrect. The setting value of the communication setting when the iQSS function is executed is out of range. When the iQSS function is executed, the items of communication setting which cannot be set on the target device are set. When the iQSS function is executed, the required setting items have not been set to the target device. 	<ul style="list-style-type: none"> Correct the request data and send the SLMP message to the Ethernet-equipped module again. Correct the setting details of when the iQSS function is executed, and retry the operation. 	—
C05DH	The "Monitor Request" command is received before the monitor registration is performed by the "Monitor Registration/Clear" command of the SLMP message.	Register the monitoring data using "Monitor Registration/Clear" command and perform monitoring.	—
C05EH	<ul style="list-style-type: none"> The time between reception of the SLMP request message by the Ethernet-equipped module and the returned response from the access destination exceeded the monitoring timer value set in the SLMP command. An unresponsive command was sent to another network station as the access destination. (If this error does not cause any problems, it can be ignored.) 	<ul style="list-style-type: none"> Increase the monitoring timer value. Check if the access destination is operating normally. Correct the network number or request destination station number. If the access destination is a module with a different network number, check if the network number is not in use. 	—
C05FH	This request cannot be executed to the access destination specified by the SLMP message.	Correct the access destination.	—
C060H	The request details for bit devices of the SLMP message is incorrect.	Correct the request details and send the SLMP message to the Ethernet-equipped module again.	—
C061H	<ul style="list-style-type: none"> The request data length of the SLMP message does not match the number of data in the character (a part of text). The write data length specified by the label write command is not even byte. When the iQSS function is executed, incorrect frame is received. 	<ul style="list-style-type: none"> Check and correct the text or request data length, and send the SLMP message to the Ethernet-equipped module again. Add one byte of dummy data, and specify the length as an even number of bytes. Check the operating status and connection status of the target device at the time the iQSS function is executed. Check the connection of the Ethernet cable and switching hub at the time the iQSS function is executed. Check the line status of Ethernet at the time the iQSS function is executed. Reset the CPU module and device to be targets of the iQSS function, and retry the operation. <p>For errors that occur when the iQSS function is executed, contact the manufacturer of the target device if the above actions do not solve the problem.</p>	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
C06FH	The network number of request destination specified by the SLMP request message is not available for communications with the station number 121 or larger.	<ul style="list-style-type: none"> If the 3E or 4E frame is used at SLMP, check that there is no error for the network number of the request destination and station number. If the station number extension frame is used at SLMP, check that there is no error for the network number of the request destination and station number. 	—
C070H	The device memory cannot be extended for the access destination specified by the SLMP message.	<ul style="list-style-type: none"> Correct the SLMP message to read/write data without the device memory set for extension. Specify the extension of the device memory only for an Ethernet-equipped module mounted station and a MELSEC iQ-R/Q/QnACPU via CC-Link IE Controller Network, MELSECNET/H, or MELSECNET/10. 	—
C071H	The number of device points for data read/write set for modules other than a MELSEC iQ-R/Q/QnACPU with the SLMP message is out of the range.	Correct the number of read/write points and send the SLMP message to the Ethernet-equipped module again.	—
C072H	The request details of the SLMP message are incorrect. (For example, a request for data read/write in bit units has been issued to a word device.)	<ul style="list-style-type: none"> Check if the data can be requested to the access destination. Correct the request details and send the SLMP message to the Ethernet-equipped module again. 	—
C073H	The access destination of the SLMP message cannot issue this request. (For example, the number of double word access points cannot be specified for modules other than a MELSEC iQ-R/Q/QnACPU.)	Correct the request details of the SLMP message.	—
C075H	The request data length for the label access is out of range.	<ul style="list-style-type: none"> Correct the number of read/write points and send the SLMP message to the Ethernet-equipped module again. Correct the label to shorten the label name and send the SLMP message to the Ethernet-equipped module again. 	—
C081H	The termination processing for the Ethernet-equipped module that is involved with the reinitialization processing is being performed, and arrival of link dedicated instructions cannot be checked.	Finish all the communications to perform the reinitialization processing of the Ethernet-equipped module.	—
C087H	IP address of the destination external device could not be acquired.	<ul style="list-style-type: none"> Correct the IP address in the network station number ↔ IP information setting. Check if the network or station number of the external device is correctly specified by using control data of the dedicated instruction. Check if the Ethernet cable is disconnected. 	—
C0B2H	There is insufficient space in the receive buffer or the send buffer of the relay station or external station for the MELSOFT connection, link dedicated instructions, or SLMP. (Send · receive buffer full error)	<p>Increase the request interval (execution interval) and execute the operation.</p> <ul style="list-style-type: none"> Do not access through one station using the MELSOFT connection, link dedicated instruction, or SLMP. Wait for a response to the previous request before sending the next request. Correct the timer setting value for data communication of the Ethernet-equipped module. 	—
C0B3H	A request that cannot be processed was issued from the CPU module.	<ul style="list-style-type: none"> Correct the request details. Correct the network number or request destination station number. 	—
C0D4H	The number of relay stations to communicate with other networks exceeds the allowable range.	<ul style="list-style-type: none"> Check if the specification (network number/station number) for the communication destination is correct. Check that the number of relay stations accessing the communication destination is 7 or less. Correct the settings in the network station number ↔ IP information setting for the stations from the own station to the communication destination. 	—
C0D8H	The number of specified blocks exceeded the range.	Correct the number of blocks.	—
C0D9H	The specified subcommand of the SLMP message is incorrect.	Correct the subcommand.	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
C1A4H	<ul style="list-style-type: none"> There is an error with the command, subcommand, or request destination module I/O number specified by the SLMP message. A function that is not supported by the target device was executed. 	<ul style="list-style-type: none"> Correct the command, subcommand, or request destination module I/O number specified by SLMP message. Check the version of the target device. 	—
C1A7H	The specified network number is incorrect.	Correct the specified network number.	—
C1A9H	The specified device number is incorrect.	Correct the specified device number.	—
C1ADH	The specified data length is incorrect.	Correct the specified data length.	—
C1CCH	System error	Please consult your local Mitsubishi representative.	—
C200H	The remote password is incorrect.	Correct the remote password, and unlock/lock the remote password again.	—
C201H	The remote password status of the port used for communications is in the lock status.	After unlocking the remote password, perform communications.	—
C202H	When another station was accessed, the remote password could not be unlocked.	When accessing another station, do not set the remote password on the relay station or access station, or do not execute the remote password check on them.	—
C203H	An error has occurred when checking the remote password.	Correct the remote password, and unlock/lock the remote password again.	—
C204H	The device is different from the one requesting the remote password unlock processing.	Request the lock processing of the remote password from the external device that requested the unlock processing of the remote password.	—
C207H	The file name has too many characters.	Name the file with 255 characters or less.	—
C208H	The password length is out of range.	Set the password within 6 to 32 characters.	—
C612H	The module processing was completed with an error.	<ul style="list-style-type: none"> Execute the communication status test, and if the test was completed with an error, take the corrective action. Execute the module communication test, and check that there is no failure in the module. 	—
C613H	The module processing was completed with an error.	<ul style="list-style-type: none"> Execute the communication status test, and if the test was completed with an error, take the corrective action. Execute the module communication test, and check that there is no failure in the module. 	—
C615H	The module processing was completed with an error.	<ul style="list-style-type: none"> Execute the communication status test, and if the test was completed with an error, take the corrective action. Execute the module communication test, and check that there is no failure in the module. 	—
C810H	Remote password authentication has failed when required.	Set a correct password and perform password authentication again.	—
C811H	Remote password authentication has failed when required.	Set a correct password and perform password authentication again one minute later.	—
C812H	Remote password authentication has failed when required.	Set a correct password and perform password authentication again 5 minutes later.	—
C813H	Remote password authentication has failed when required.	Set a correct password and perform password authentication again 15 minutes later.	—
C814H	Remote password authentication has failed when required.	Set a correct password and perform password authentication again 60 minutes later.	—
C815H	Remote password authentication has failed when required.	Set a correct password and perform password authentication again 60 minutes later.	—
C816H	The security function was activated and remote password authentication cannot be performed.	Set a correct password and perform password authentication again after a certain period of time.	—
C842H	Cannot reach to the destination network number.	Execute the link dedicated instruction again after correcting the target network number/station number.	—
C844H	Incorrect frame was received. <ul style="list-style-type: none"> Unsupported command 	<ul style="list-style-type: none"> Replace the network module with a module of the version supporting the function that has been executed. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
C900H	Communication failed.	Do not execute communication from multiple engineering tools to the same master station simultaneously.	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
C901H	The size of the request data to the external device or response data from the external device exceeds the range supported for communications.	Correct the size of the request data or response data to within 1500 bytes.	—
C902H	Communication was interrupted because no response was returned from the external device.	Execute the communication test, and if the test was completed with an error, take corrective action.	—
C903H	Failed to send request to the external device.	<ul style="list-style-type: none"> Correct the IP address of the external device. Check if the subnet mask of the external device matches the master station. Check if the external device matches the communication speed. Check if the Ethernet cable is connected properly and there is no failure. 	—
CA00H to CA0AH	System error	Please consult your local Mitsubishi representative.	—
CCC7H to CCCCH	System error	Please consult your local Mitsubishi representative.	—
CCD3H to CCD6H	System error	Please consult your local Mitsubishi representative.	—
CCDAH	System error	Please consult your local Mitsubishi representative.	—
CCFFH	System error	Please consult your local Mitsubishi representative.	—
CF40H	Incorrect frame was received.	<ul style="list-style-type: none"> Check the operating status and connection status of the target device. Check the connection of the Ethernet cable and switching hub. Check the line status of Ethernet. Reset the CPU module and target device, and retry the operation. <p>If the above actions do not solve the problem, contact the manufacturer of the target device.</p>	—
CF41H	Incorrect frame was received.	<ul style="list-style-type: none"> Check the operating status and connection status of the target device. Check the connection of the Ethernet cable and switching hub. Check the line status of Ethernet. Reset the CPU module and target device, and retry the operation. <p>If the above actions do not solve the problem, contact the manufacturer of the target device.</p>	—
CF42H	Incorrect frame was received.	<ul style="list-style-type: none"> Check the operating status and connection status of the target device. Check the connection of the Ethernet cable and switching hub. Check the line status of Ethernet. Reset the CPU module and target device, and retry the operation. <p>If the above actions do not solve the problem, contact the manufacturer of the target device.</p>	—
CF43H	An error has occurred.	<ul style="list-style-type: none"> Check the operating status of the external device. Check if there is any error in the line status. <p>If the above actions do not solve the problem, contact the manufacturer of the target device.</p>	—
CF44H	Incorrect frame was received.	<ul style="list-style-type: none"> Check the operating status and connection status of the target device. Check the connection of the Ethernet cable and switching hub. Check the line status of Ethernet. Reset the CPU module and target device, and retry the operation. <p>If the above actions do not solve the problem, contact the manufacturer of the target device.</p>	—
D03BH to D03CH	System error	Please consult your local Mitsubishi representative.	—
D0A3H	Send processing of the transient transmission has failed.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. When the own station, target station, or relay station detected an error, identify the cause of the error and take action. Correct the target station number of transient data, and retry the operation. 	—
D203H	The read data or write address of the transient transmission is incorrect.	Correct the read data or write address at the transient request source, and retry the operation.	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D205H	The target station number of transient transmission is incorrect.	Correct the target station number at the transient request source, and retry the operation.	—
D20AH	The target network number of transient transmission is incorrect.	Correct the target network number at the transient request source, and retry the operation.	—
D20BH	There was no master station when the specified master station was specified for transient transmission.	Correct the target station number at the transient request source, and retry the operation.	—
D20CH	There was no master station when the current master station was specified for transient transmission.	Correct the target station number at the transient request source, and retry the operation.	—
D20DH	Transmission completion wait timeout has occurred in transient data transmission.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. When the own station, target station, or relay station detected an error, identify the cause of the error and take action. Lower the transient transmission usage frequency, and retry the operation. Check if the switching hub and the Ethernet cables at the request source are connected properly. 	—
D20EH	The header information of transient transmission is incorrect.	Correct the header information at the transient request source, and retry the operation.	—
D20FH	In transient transmission, the command which cannot be requested to all or a group of stations was executed with all stations specification or group specification.	Check that the command can be requested to all or a group of stations at the transient request source, and retry the operation.	—
D211H	Transient transmission was performed when the station number/IP address of the own station had not been set yet.	Set the station number/IP address using the UNI instruction, and perform transient transmission again.	—
D213H	<ul style="list-style-type: none"> The command of transient transmission is incorrect. The CC-Link IE TSN/CC-Link IE Field diagnostics was used for the network to which the relay receiving station belongs. This function is not available for the module of the connection destination. 	<ul style="list-style-type: none"> Correct the request command at the transient request source, and retry the operation. Review the connection destination so that the CC-Link IE TSN/CC-Link IE Field diagnostics is used for the network to which the relay sending station belongs. Refer to the manual for the module of the connection destination, and check whether the module supports this function. If the module does not support the function, update firmware version so that the module supports the function. 	—
D214H	The data length of transient transmission is incorrect.	Correct the data length at the transient request source, and retry the operation.	—
D239H	SLMP transmission failed.	<ul style="list-style-type: none"> Retry the operation after a while. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D240H	The network number specification of the dedicated instruction is incorrect.	Correct the network number at the request source of the dedicated instruction, and retry the operation.	—
D241H	The target station number of the dedicated instruction is incorrect.	Correct the target station number at the request source of the dedicated instruction, and retry the operation.	—
D242H	The command code of the dedicated instruction is incorrect.	Correct the command code at the request source of the dedicated instruction, and retry the operation.	—
D243H	The channel specified in the dedicated instruction is incorrect.	Correct the used channel within the allowable range at the request source of the dedicated instruction, and retry the operation.	—
D244H	The transient data is incorrect.	<ul style="list-style-type: none"> Correct the transient data at the transient request source, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D245H	The target station number of the dedicated instruction is incorrect.	Correct the target station number at the request source of the dedicated instruction, and retry the operation.	—
D247H	When the dedicated instruction was executed, response from the target station was received twice.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. Check if the switching hub and the Ethernet cables at the request source are connected properly. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D249H	The target station CPU type of the dedicated instruction is incorrect.	Correct the CPU type of the target station at the request source of the dedicated instruction, and retry the operation.	—
D24AH	The arrival monitoring time specification of the dedicated instruction is incorrect.	<ul style="list-style-type: none"> Correct the arrival monitoring time at the request source of the dedicated instruction, and retry the operation. When the own station, target station, or relay station detected an error, identify the cause of the error and take action. Lower the transient transmission usage frequency, and retry the operation. Check if the switching hub and the Ethernet cables at the request source are connected properly. 	—
D24BH	The number of resends specified in the dedicated instruction is incorrect.	<ul style="list-style-type: none"> Correct the number of resends at the request source of the dedicated instruction, and retry the operation. When the own station, target station, or relay station detected an error, identify the cause of the error and take action. Lower the transient transmission usage frequency, and retry the operation. Check if the switching hub and the Ethernet cables at the request source are connected properly. 	—
D24CH	The network number specification of the dedicated instruction is incorrect.	Correct the network number at the request source of the dedicated instruction, and retry the operation.	—
D24DH	The channel specified in the dedicated instruction is incorrect.	<ul style="list-style-type: none"> Set 1 to 2 for the target channel number in the control data when executing the SEND instruction. Correct the number of the channel used by own station in the control data, and retry the operation. 	—
D24EH	The target station setting in the dedicated instruction is incorrect.	<ul style="list-style-type: none"> The value set for the control block of the dedicated instruction is out of range. Correct the value and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D24FH	The dedicated instruction was executed when the station number/IP address of the own station had not been set yet.	<ul style="list-style-type: none"> Specify the station number/IP address using the UINI instruction, and execute the instruction again. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D251H	At execution of a dedicated instruction, or group specification or all stations specification of the target station, the execution type is set with arrival check.	<ul style="list-style-type: none"> Execute again after changing the execution type in the control data to no arrival check. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D253H	A response timeout has occurred when the dedicated instruction was executed.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. For IP address specification, it is not possible to target stations beyond a relay station. Execute the dedicated instruction by specifying the network number/station number. Increase the number of resends at the request source of the dedicated instruction, and retry the operation. Lower the transient transmission usage frequency, and retry the operation. Execute the dedicated instruction for a target station that supports the executed dedicated instruction. For the RECV instruction, correct the channels used by own station in the control data, and retry the operation. For the RECV instruction, check that 'RECV execution request flag CH1' (SB0030) to 'RECV execution request flag CH8' (SB0037) are on. Correct the network number and station number/IP address of the target station of the dedicated instruction. Check if the Ethernet cable is disconnected. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D254H	A dedicated instruction which the target station does not support was executed.	<ul style="list-style-type: none"> 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. 	—
D255H	The target station number of the dedicated instruction is incorrect.	<ul style="list-style-type: none"> Correct the target station number in the control data, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D256H	The execution or error completion type of the dedicated instruction is incorrect.	<ul style="list-style-type: none"> Correct the execution or error completion type in the control data, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D257H	The request type of the REQ instruction is incorrect.	<ul style="list-style-type: none"> Correct the request type in the request data, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D258H	The control station does not exist when the dedicated instruction was executed to the specified control station or current control station.	<ul style="list-style-type: none"> Correct the target station number in the control data, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D25AH	The dedicated instruction was executed specifying the channel in use.	<ul style="list-style-type: none"> Retry the operation after a while. Change the channels used by own station or the target station's channel in the control data. Execute the RECV instruction at the external device, and then execute the SEND instruction. 	—
D25BH	The dedicated instruction was executed specifying the channel in use.	Change the channels used by own station or the target station's channel in the control data.	—
D25DH	The transient data is incorrect.	<ul style="list-style-type: none"> Correct the transient data at the transient request source, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D25FH	System error	Please consult your local Mitsubishi representative.	—
D260H	System error	Please consult your local Mitsubishi representative.	—
D262H to D26CH	System error	Please consult your local Mitsubishi representative.	—
D26FH to D272H	System error	Please consult your local Mitsubishi representative.	—
D273H	The request data size of transient transmission is incorrect.	<ul style="list-style-type: none"> Correct the request command at the transient request source, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D275H	Other dedicated instructions are in execution, and the executed instruction cannot be processed.	<ul style="list-style-type: none"> 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. 	—
D27AH	The own station number set in the UINI instruction is incorrect.	<ul style="list-style-type: none"> Set the station number of the own station in the control data to a value from 1 to 120, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D27BH	The IP address set in the UINI instruction is incorrect.	<ul style="list-style-type: none"> Execute again after correcting the IP address in the control data. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D27CH	System error	Please consult your local Mitsubishi representative.	—
D27FH	System error	Please consult your local Mitsubishi representative.	—
D2C0H to D2D1H	System error	Please consult your local Mitsubishi representative.	—
D2D2H	The IP address/port number of the target station is incorrect.	<ul style="list-style-type: none"> Execute again after correcting the port number of the target station in the setting data. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D2D3H	Send processing of the transient transmission has failed.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. When the own station, target station, or relay station detected an error, identify the cause of the error and take action. Correct the target IP address of transient data, and retry the operation. 	—
D602H	Parameter error	<ul style="list-style-type: none"> Write the network parameter to the CPU module again. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D605H	Parameter error	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D60BH to D610H	System error	Please consult your local Mitsubishi representative.	—
D611H	Parameter error (each station device range assignment error (RWw))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D612H	Parameter error (each station device range assignment error (RWw))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D613H	Parameter error (each station device range assignment error (RWr))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D614H	Parameter error (each station device range assignment error (RWr))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D615H	Parameter error (each station device range assignment error (RY))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D616H	Parameter error (each station device range assignment error (RY))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D617H	Parameter error (each station device range assignment error (RX))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D618H	Parameter error (each station device range assignment error (RX))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D619H	Parameter error	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D61AH	Parameter error	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D61BH	Parameter error (device overlap error (RWw))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset or size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D61CH	Parameter error (device overlap error (RWr))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset or size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D61DH	Parameter error (device overlap error (RY))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset or size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D61EH	Parameter error (device overlap error (RX))	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the offset or size of the slave station link device in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D61FH	System error	Please consult your local Mitsubishi representative.	—
D621H	Parameter error	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D622H	Parameter error (error in the total number of slave stations)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the total number of slave stations. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D625H	Parameter error (station-based block data assurance setting error)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the station-based block data assurance setting. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D628H	Parameter error (station type error)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the station type in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D629H	Parameter error (station number range error)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the station number in the setting data so it is within 1 to 120. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D62AH	Parameter error (data link faulty station setting error)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the data link faulty station setting. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D62BH	Parameter error (output setting error during CPU STOP)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the output settings during CPU STOP. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D630H	System error	Please consult your local Mitsubishi representative.	—
D637H	The UINI instruction was executed at a station where the station number/IP address has been already set by parameter.	Execute again after setting "Station No./IP Address Setting Method" under "Station No./IP Address Setting" in "Required Settings" to "Program".	—
D639H	After setting a station number/IP address with the UINI instruction, the instruction was executed again.	Station number/IP address setting with the UINI instruction is limited to one time only. Reset the CPU module, and retry the operation.	—
D641H	Parameter error (IP address error)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the IP address in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D642H	Parameter error (gateway address setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the gateway address setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D643H	Parameter error (communication cycle setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the communication cycle setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D644H	Parameter error (cyclic transmission time setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the cyclic transmission time in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D645H	Parameter error (transient transmission time setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the communication cycle setting or cyclic transmission time in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D646H	Parameter error (transmission path setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the transmission path setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D647H	Parameter error (time synchronization setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the time synchronization setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D648H	System error	Please consult your local Mitsubishi representative.	—
D649H	Parameter error (send timeslot setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the send timeslot setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D64AH	Parameter error (number of data link error detection)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the number of data link error detection in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D64BH	Parameter error (number of occupied stations)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the number of occupied stations in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D64CH	System error	Please consult your local Mitsubishi representative.	—
D64DH	Parameter error (parameter automatic setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the parameter automatic setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D64EH	System error	Please consult your local Mitsubishi representative.	—
D64FH	Parameter error (cyclic frame cycle setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the cyclic frame cycle setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D650H	System error	Please consult your local Mitsubishi representative.	—
D651H	Parameter error (number of modules)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the number of modules in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D652H	Parameter error (communication mode setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the communication mode setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D653H	Parameter error (transient transmission group setting)	<ul style="list-style-type: none"> • Write the network parameter to the CPU module again. • Execute again after correcting the transient transmission group setting in the setting data. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D654H	System error	Please consult your local Mitsubishi representative.	—
D655H	Network addresses of the master station and slave stations are incorrect.	Correct the IP address setting of the master station or slave stations.	—
D656H	System error	Please consult your local Mitsubishi representative.	—
D657H	Parameter error	<ul style="list-style-type: none"> Write the network parameter to the CPU module again. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D658H	Parameter error	<ul style="list-style-type: none"> Write the network parameter to the CPU module again. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D720H to D725H	System error	Please consult your local Mitsubishi representative.	—
D727H to D729H	System error	Please consult your local Mitsubishi representative.	—
D731H	System error	Please consult your local Mitsubishi representative.	—
D742H	System error	Please consult your local Mitsubishi representative.	—
D840H	Number of transient requests exceeded the upper limit of simultaneously processable requests.	<ul style="list-style-type: none"> Pause the transient transmission temporarily, and retry the operation. Lower the transient transmission usage frequency, and retry the operation. 	—
D841H	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.	—
D842H	System error	Please consult your local Mitsubishi representative.	—
D843H	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 transient transmission.	—
D844H	Incorrect frame was received. <ul style="list-style-type: none"> 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.	—
D902H	The online test data is incorrect.	<ul style="list-style-type: none"> Correct the data at the station that started the online test, and retry the operation. If the error occurs again even after taking the above, please consult your local Mitsubishi representative. 	—
D903H	During execution of the communication test, the test was retried.	After completion of the communication test, retry the operation.	—
D905H	A communication monitoring timeout has occurred in communication test.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. Then, retry the operation. 	—
D906H	Transmission completion wait timeout has occurred in communication test.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. Then, retry the operation. Lower the transient transmission usage frequency, and retry the operation. 	—
D909H	The header information of transient transmission is incorrect.	Correct the header information at the transient request source, and retry the operation.	—
D90AH	During execution of the communication test, the test was retried.	Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. Then, retry the operation.	—
D90BH	The number of stations that communicate in the network is out of the specification range.	<ul style="list-style-type: none"> Check the network status using the CC-Link IE TSN/CC-Link IE Field diagnostics of the engineering tool, and take action. If the number of slave stations per network is more than 120, reduce it to 120 or less. 	—

Error code	Error definition and causes	Action	Detailed information 1
			Detailed information 2
D90CH	The communication destination specified for the communication test is incorrect.	<ul style="list-style-type: none"> Correct "Target Station" of communication test, and retry the operation. Do not execute the communication test for own station and relay sending station. Set "Target Station" to other than own station and relay transmission station. The target station is mounted on the same CPU module as the connected station (own station). Do not execute the communication test for a station on the same CPU module as the connected station (own station). 	—
D90DH	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
D912H	Transient transmission sending failed.	<ul style="list-style-type: none"> Lower the transient transmission usage frequency, and retry the operation. Check if the switching hub and the Ethernet cables are connected properly. 	—
D913H to D917H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
D919H	No response from the target station of the communication test.	<ul style="list-style-type: none"> Correct the network number, station number, or IP address for the target station of the communication test. Check if the network configuration setting is correctly set in the master station within the same network as the target station of the communication test. When "IP Address" is selected for "Communication Method", "Communication Test" cannot be executed for stations on networks different from that of the connected station (own station). Change "Communication Method" to "Network No./Station No.". 	—
DA00H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
DA10H to DA17H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
DA19H	An error was detected in the network module.	Please consult your local Mitsubishi representative.	—
DA1AH	System error	Please consult your local Mitsubishi representative.	—
DA1BH	A dedicated instruction which the target station does not support was executed.	<ul style="list-style-type: none"> Change the target station at the station that executed the READ/SREAD/ WRITE/SWRITE/SEND/ instruction. Correct the network number and station number/IP address of the target station of the dedicated instruction. 	—
DA1CH	The target station of the READ/SREAD/ WRITE/SWRITE/SEND instruction does not exist.	If the target station of the READ/SREAD/ WRITE/SWRITE/SEND instruction is disconnected, execute the dedicated instruction again after return of the target station.	—
DB00H	The station numbers of 121 stations or more are specified.	Check station numbers.	—

10.6 List of Parameter Numbers

The following table lists the parameter numbers displayed in "Module Diagnostics".

If there is an error in the parameter settings and the parameter number is displayed, the corresponding parameter can be identified.

It is displayed in "Detailed information" in the [Error Information] tab in the "Module Diagnostics" window of the FX5-CCLGN-MS. (☞ Page 141 Error Information)

Item				Parameter No.	
Required Settings	Station Type	Station Type		7100H	
	Network No.	Network No.		7100H	
	Parameter Setting Method	Setting Method of Basic/Application Settings		7100H	
	Station No./IP Address Setting	Setting Method of Station No./IP Address Setting Method		7100H	
		Station No.	Station No.	7100H	
		IP Address	IP Address	A012H	
			Subnet Mask	A012H	
			Default Gateway	A013H	
Basic Settings	Refresh Settings	Refresh Settings		7401H	
	Network Topology	Network Topology		A100H	
	Communication Period Setting	Basic Period Setting	Setting in Units of 1μs	A100H	
			Communication Period Interval Setting (Do Not Set it in Units of 1μs)	A100H	
			Communication Period Interval Setting (Set it in Units of 1μs)	A100H	
			Cyclic Transmission Time	A100H	
			Transient Transmission Time	A100H	
	Connection Device Information	Multiple Period Setting	Normal-Speed	A100H	
			Low-Speed	A100H	
	Slave Station Setting		Authentication Class Setting	A100H	
			Disconnection Detection Setting	A100H	
Application Settings	Supplementary Cyclic Settings	Station-based Block Data Assurance		A100H	
		I/O Maintenance Settings	Output Hold/Clear Setting during CPU STOP	A110H	
			Data Link Error Station Setting	A110H	
			Output Mode upon CPU Error	7101H	
	Transient Transmission Group No.		Transient Transmission Group No.	A010H	
	Parameter Name		Parameter Name	7310H	
	Module Operation Mode		Module Operation Mode	7100H	
	Security	IP Filter Settings	IP Filter	A03AH	
			IP Filter Settings	Deny/Allow	
				IP Address	
				Range Setting	
				IP Address Excluded from Range	

10.7 Event List

This section lists the events which occur in CC-Link IE TSN.

The event history is displayed when the [Event History] button in the [Error Information] tab in the "Module Diagnostics" window of the FX5-CCLGN-MS is clicked. (☞ Page 141 Error Information)

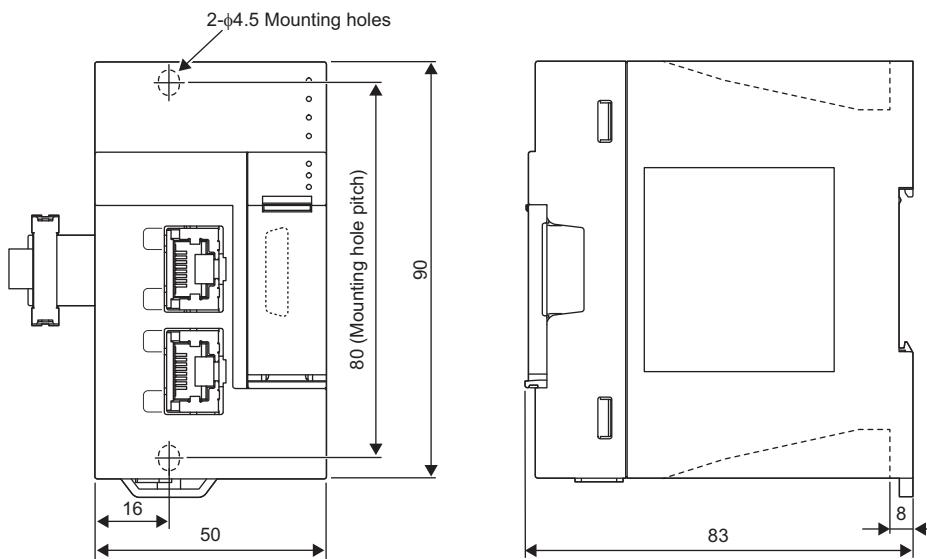
System

Event code	Description	Cause
00800	Link-down	The system was linked down by removing a device (such as an external device).
00907	Divided messages receive timeout error	<ul style="list-style-type: none">• Sufficient data for the data length could not be received.• The remaining part of the divided message could not be received.
00C40	Slave station parameter automatic setting: Interruption	An abnormal response was received from the slave station, and slave station parameter automatic setting processing was interrupted. (For details on slave station response codes, refer to the manual for the slave station.)
00C41	Slave station parameter automatic setting: Parameter update interruption	An abnormal response was received from the slave station, and parameter update processing of slave station parameter automatic setting was interrupted. (For details on slave station response codes, refer to the manual for the slave station.)
00C42	Slave station parameter automatic setting: System error	An error occurred while the slave station parameter automatic setting was executing.
00C43	Slave station parameter automatic setting: Transmission timeout	Transmission timed out while communicating with the slave station parameter automatic setting.
00C44	Slave station parameter automatic setting: Receive timeout	The specified period of time expired without receiving while communicating with the slave station parameter automatic setting.
00C46	Slave station parameter automatic setting: SLMP transmission error	An error occurred while transmitting SLMP for the slave station parameter automatic setting.
00C47	Slave station parameter automatic setting: CPU module access failure	Access to the CPU module failed during slave station parameter automatic setting.
00C48	Slave station parameter automatic setting: No target station parameter	The station parameter file targeted during slave station parameter automatic setting was not stored in the CPU module.

APPENDICES

Appendix 1 External Dimensions

The following shows the external dimensions of the FX5-CCLGN-MS.



(Unit: mm)

• Weight: Approx. 0.3kg

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Appendix 2 Standard Compliant Model

UL, cUL standards compliant model

The FX5-CCLGN-MS is compliant with UL standards (UL, cUL Standards).

For UL Standards compliant models, refer to the following.

Mitsubishi Electric FA website www.MitsubishiElectric.co.jp/fa

UL, cUL File Number: E95239

EC Directive (CE marking) compliance

Conformity of the entire machinery manufactured by using this product to the following directives is not guaranteed.

The manufacturer of the machinery must determine whether to declare conformity to the EMC Directive and the Low Voltage Directive (LVD). For details, consult Mitsubishi Electric separately.

Measures to comply with the EMC Directive

The following product, when used in accordance with instructions given by the relevant document, shows conformity to the EU directive (2014/30/EU) for electromagnetic compatibility through direct testing (using the following specified standards) and design analysis (by creating a technical structure file).

CAUTION

Use this product in a general industrial environment.

Product conformity item

Type: Programmable controller (open-type device)

Target product: FX5 manufactured in the following period

Manufactured on and after April 1, 2020	FX5-CCLGN-MS
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Electromagnetic Compatibility (EMC) Directive	Remarks
EN 61131-2:2007 Programmable Controllers - Equipment requirements and tests	The product has been tested for all related items from the following. EMI • Radiated emission • Conducted emission EMS • Radiated electromagnetic field • Fast transient burst • Electrostatic discharge • High-energy surge • Voltage drops and interruptions • Conducted RF • Power frequency magnetic field

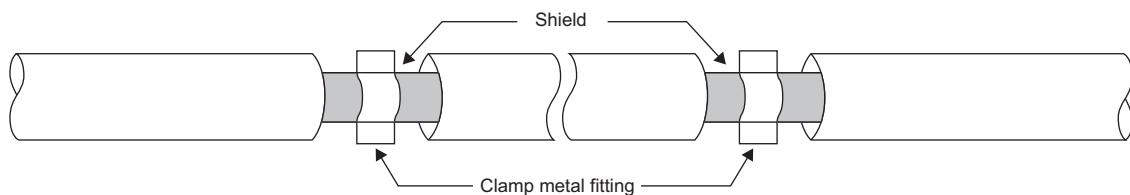
Precautions for compliance with EC Directive

Precautions when using the FX5-CCLGN-MS

When using the FX5-CCLGN-MS, attach ferrite cores with the power supplies of the CPU module and the FX5-CCLGN-MS. Attach the ferrite core with each cable wrapped around it three times at a location within approximately 200mm from the terminal block of the power cable and connector. (Ferrite core used for testing by Mitsubishi Electric: E04SR401938 manufactured by SEIWA ELECTRIC MFG. CO., LTD.)

Precautions when using an Ethernet port

Use a double shielded twisted pair cable as the 1000BASE-T cable. Strip a part of the jacket of the shielded twisted pair cable as shown below and ground both ends of the cable with the exposed shield to the largest area.



Power source of 24VDC power supply voltage

Supply power to the 24VDC power supply voltage of the FX5-CCLGN-MS from the AC/DC power supply installed in the same control panel. (AC/DC power supply used for testing by Mitsubishi Electric: PS5R-VE24 manufactured by IDEC CORPORATION.)

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Appendix 3 Buffer Memory

The buffer memory is used to exchange data between the FX5-CCLGN-MS and the FX5 CPU module. Buffer memory values are reset to default when the FX5 CPU module is reset or the system is powered off.

List of buffer memory addresses

←: Same as the address of P1

P1		P2		Name		Read, write
Address (decimal)	Address (hexadecimal)	Address (decimal)	Address (hexadecimal)			
0 to 28	0000H to 001CH	←		Module information area	System area	
29	001DH	←			Latest error code	Read
30	001EH	←			Unique code	Read
31	001FH	←			Firmware version	Read
32 to 33	0020H to 0021H	←			System area	
34 to 35	0022H to 0023H	←			Input signals	Read
36 to 255	0024H to 00FFH	←			System area	
256 to 1279	0100H to 04FFH	←		Device area	RX area	Read
1280 to 2303	0500H to 08FFH	←			RY area	Read, write
2304 to 10495	0900H to 28FFH	←			RWw area	Read, write
10496 to 18687	2900H to 48FFH	←			RWr area	Read
18688 to 18943	4900H to 49FFH	←			SB area	Read, write
18944 to 23039	4A00H to 59FFH	←			SW area	Read, write
23040 to 23551	5A00H to 5BFFH	←		System area		
23552 to 23553	5C00H to 5C01H	←		Timeslot 0 information	Timeslot 0 cycle start offset (ns unit)	Read
23554	5C02H	←			Timeslot 0 cycle start offset (s unit)	Read
23555	5C03H	←			System area	
23556 to 23557	5C04H to 5C05H	←			Timeslot 0 cycle end offset (ns unit)	Read
23558	5C06H	←			Timeslot 0 cycle end offset (s unit)	Read
23559 to 23567	5C07H to 5C0FH	←			System area	
23568 to 23679	5C10H to 5C7FH	←		Timeslot 1 to 7 information	Same as Timeslot 0 information	Read
23680 to 23807	5C80H to 5CFFH	←			System area	
23808 to 23809	5D00H to 5D01H	←		RX offset/size information	Station No.0 RX offset	Read
23810 to 23811	5D02H to 5D03H	←			Station No.0 RX size	Read
⋮	⋮	⋮	⋮		⋮	
24288 to 24289	5EE0H to 5EE1H	←			Station No.120 RX offset	Read
24290 to 24291	5EE2H to 5EE3H	←			Station No.120 RX size	Read
24292 to 24831	5EE4H to 60FFH	←			System area	
24832 to 24833	6100H to 6101H	←		RY offset/size information	Station No.0 RY offset	Read
24834 to 24835	6102H to 6103H	←			Station No.0 RY size	Read
⋮	⋮	⋮	⋮		⋮	
25312 to 25313	62E0H to 62E1H	←			Station No.120 RY offset	Read
25314 to 25315	62E2H to 62E3H	←			Station No.120 RY size	Read
25316 to 25855	62E4H to 64FFH	←			System area	

P1		P2		Name	Read, write	
Address (decimal)	Address (hexadecimal)	Address (decimal)	Address (hexadecimal)			
25856 to 25857	6500H to 6501H	←		RWw offset/size information	Station No.0 RWw offset	Read
25858 to 25859	6502H to 6503H	←			Station No.0 RWw size	Read
⋮		←			⋮	
26336 to 26337	66E0H to 66E1H	←			Station No.120 RWw offset	Read
26338 to 26339	66E2H to 66E3H	←			Station No.120 RWw size	Read
26340 to 26879	66E4H to 68FFH	←			System area	
26880 to 26881	6900H to 6901H	←		RWr offset/size information	Station No.0 RWr offset	Read
26882 to 26883	6902H to 6903H	←			Station No.0 RWr size	Read
⋮		←			⋮	
27360 to 27361	6AE0H to 6AE1H	←			Station No.120 RWr offset	Read
27362 to 27363	6AE2H to 6AE3H	←			Station No.120 RWr size	Read
27364 to 27903	6AE4H to 6CFFH	←			System area	
27904 to 28159	6D00H to 6DFFH	←		Own station (network card) information	System area	
28160	6E00H	←			Manufacturer code	Read
28161	6E01H	←			Model type	Read
28162	6E02H	←			Model code (lower 2 bytes)	Read
28163	6E03H	←			Model code (upper 2 bytes)	
28164	6E04H	←			Version	Read
28165 to 28167	6E05H to 6E07H	←			MAC address	Read
28168	6E08H	←		Own station (controller) information	Controller information valid/invalid flag	Read
28169	6E09H	←			Manufacturer code	Read
28170	6E0AH	←			Model type	Read
28171	6E0BH	←			Model code (lower 2 bytes)	Read
28172	6E0CH	←			Model code (upper 2 bytes)	
28173	6E0DH	←			Version	Read
28174 to 28183	6E0EH to 6E17H	←			Model name string	Read
28184 to 28185	6E18H to 6E19H	←			Vendor-specific device information	Read
28186 to 28191	6E1AH to 6E1FH	←			System area	
28192 to 36607	6E20H to 8EFFH	←		System area	System area	
36608	8F00H	←			Communication path determination status (network No.1 to 16)	Read
36609 to 36623	8F01H to 8F0FH	←			Communication path determination status (network No.17 to 239)	Read
36624 to 51199	8F10H to C7FFH	←			System area	
51200	C800H	←		Time synchronization	Time distribution interval setting of the CPU module	Read, write
51201	C801H	←			Time reflection setting to the CPU module	Read, write
51202 to 51967	C802H to CAFFH	←			System area	
51968	CB00H	←		Grandmaster information	Grandmaster	Read
51969 to 51970	CB01H to CB02H	←			System area	
51971 to 51973	CB03H to CB05H	←			Grandmaster MAC address	Read
51974 to 51996	CB06H to CB1CH	←		System area	System area	
51997	CB1DH	←			PTP frame send source check enable/disable	Read, write
51998	CB1EH	←			PTP frame send source check result (P1)	Read
51999	CB1FH	←			PTP frame send source check result (P2)	Read
52000 to 52227	CB20H to CC03H	←			System area	

P1		P2		Name	Read, write	
Address (decimal)	Address (hexadecimal)	Address (decimal)	Address (hexadecimal)			
52228 to 52229	CC04H to CC05H	60164 to 60165	EB04H to EB05H	P1: Own node setting status storage area P2: System area	Own node IP address	Read
52230 to 52237	CC06H to CC0DH	60166 to 60173	EB06H to EB0DH		System area	
52238 to 52239	CC0EH to CC0FH	60174 to 60175	EB0EH to EB0FH		Subnet mask	Read
52240 to 52241	CC10H to CC11H	60176 to 60177	EB10H to EB11H		System area	
52242 to 52243	CC12H to CC13H	60178 to 60179	EB12H to EB13H		Default gateway IP address	Read
52244 to 52251	CC14H to CC1BH	60180 to 60187	EB14H to EB1BH		System area	
52252 to 52254	CC1CH to CC1EH	60188 to 60190	EB1CH to EB1EH		Own node MAC address	Read
52255	CC1FH	60191	EB1FH		Own node network number	Read
52256	CC20H	60192	EB20H		Station No.	Read
52257	CC21H	60193	EB21H		Transient transmission group No.	Read
52258 to 52260	CC22H to CC24H	60194 to 60196	EB22H to EB24H		System area	
52261	CC25H	60197	EB25H		Auto-open UDP port port number	Read
52262	CC26H	60198	EB26H		MELSOFT transmission port (TCP/IP) port number	Read
52263	CC27H	60199	EB27H		MELSOFT transmission port (UDP/IP) port number	Read
52264	CC28H	60200	EB28H		System area	
52265	CC29H	60201	EB29H		SLMP transmission port (TCP/IP) port number	Read
52266	CC2AH	60202	EB2AH		SLMP transmission port (UDP/IP) port number	Read
52267 to 52323	CC2BH to CC63H	60203 to 60259	EB2BH to EB63H	System area		
52324 to 52451	CC64H to CCE3H	60260 to 60387	EB64H to EBE3H	P1: Connection status storage area P2: System area	System area	
52452 to 52458	CCE4H to CCEAH	60388 to 60394	EBE4H to EBEAH		Latest error code after the 2nd connection of MELSOFT transmission port (TCP/IP)	Read
52459 to 52579	CCEBH to CD63H	60395 to 60515	EBEBH to EC63H		System area	
52580 to 52586	CD64H to CD6AH	60516 to 60522	EC64H to EC6AH		Latest error code after the 2nd connection of SLMP transmission port (TCP/IP)	Read
52587 to 52735	CD6BH to CDFFH	60523 to 60671	EC6BH to ECFFH	P1: System port latest error code storage area P2: System area	System area	
52736 to 52737	CE00H to CE01H	60672 to 60673	ED00H to ED01H		System area	
52738	CE02H	60674	ED02H		Auto-open UDP port latest error code	Read
52739	CE03H	60675	ED03H		MELSOFT transmission port (UDP/IP) latest error code	Read
52740	CE04H	60676	ED04H		MELSOFT transmission port (TCP/IP) latest error code	Read
52741	CE05H	60677	ED05H		SLMP transmission port (UDP/IP) latest error code	Read
52742	CE06H	60678	ED06H		SLMP transmission port (TCP/IP) latest error code	Read
52743	CE07H	60679	ED07H		SLMPSND instruction latest error code	Read
52744 to 52991	CE08H to CEFFH	60680 to 60927	ED08H to EDFFH	System area		

P1		P2		Name	Read, write	
Address (decimal)	Address (hexadecimal)	Address (decimal)	Address (hexadecimal)	Status for each protocol (IP packet)	Received packet total count	Read
52992 to 52993	CF00H to CF01H	60928 to 60929	EE00H to EE01H		Received packet checksum error discard count	Read
52994 to 52995	CF02H to CF03H	60930 to 60931	EE02H to EE03H		Sent packet total count	Read
52996 to 52997	CF04H to CF05H	60932 to 60933	EE04H to EE05H		System area	
52998 to 53013	CF06H to CF15H	60934 to 60949	EE06H to EE15H		Simultaneous transmission error detection count (receive buffer full count)	Read
53014 to 53015	CF16H to CF17H	60950 to 60951	EE16H to EE17H		System area	
53016 to 53020	CF18H to CF1CH	60952 to 60956	EE18H to EE1CH		System area	
53021	CF1DH	60957	EE1DH		Receive abort count	Read
53022 to 53023	CF1EH to CF1FH	60958 to 60959	EE1EH to EE1FH		System area	
53024 to 53031	CF20H to CF27H	60960 to 60967	EE20H to EE27H	System area		
53032 to 53033	CF28H to CF29H	60968 to 60969	EE28H to EE29H	Status for each protocol (ICMP packet)	Received packet total count	Read
53034 to 53035	CF2AH to CF2BH	60970 to 60971	EE2AH to EE2BH		Received packet checksum error discard count	Read
53036 to 53037	CF2CH to CF2DH	60972 to 60973	EE2CH to EE2DH		Sent packet total count	Read
53038 to 53039	CF2EH to CF2FH	60974 to 60975	EE2EH to EE2FH		Received echo request total count	Read
53040 to 53041	CF30H to CF31H	60976 to 60977	EE30H to EE31H		Sent echo reply total count	Read
53042 to 53043	CF32H to CF33H	60978 to 60979	EE32H to EE33H		Sent echo request total count	Read
53044 to 53045	CF34H to CF35H	60980 to 60981	EE34H to EE35H		Received echo reply total count	Read
53046 to 53071	CF36H to CF4FH	60982 to 61007	EE36H to EE4FH	System area		
53072 to 53073	CF50H to CF51H	61008 to 61009	EE50H to EE51H	Status for each protocol (TCP packet)	Received packet total count	Read
53074 to 53075	CF52H to CF53H	61010 to 61011	EE52H to EE53H		Received packet checksum error discard count	Read
53076 to 53077	CF54H to CF55H	61012 to 61013	EE54H to EE55H		Sent packet total count	Read
53078 to 53079	CF56H to CF57H	61014 to 61015	EE56H to EE57H		System area	
53080 to 53111	CF58H to CF77H	61016 to 61047	EE58H to EE77H	System area		
53112 to 53113	CF78H to CF79H	61048 to 61049	EE78H to EE79H	Status for each protocol (UDP packet)	Received packet total count	Read
53114 to 53115	CF7AH to CF7BH	61050 to 61051	EE7AH to EE7BH		Received packet checksum error discard count	Read
53116 to 53117	CF7CH to CF7DH	61052 to 61053	EE7CH to EE7DH		Sent packet total count	Read
53118 to 53121	CF7EH to CF81H	61054 to 61057	EE7EH to EE81H		System area	
53122 to 53180	CF82H to CFBCH	61058 to 61116	EE82H to EEBCH	System area		
53181	CFBDH	61117	EEBDH	P1: Own node operating status storage area P2: System area	P1: Own node operating status storage area	Read
53182	CFBEH	61118	EEBEH		P2: System area	
53183	CFBFH	61119	EEBFH		Own node operation status storage area	Read
53184	CFC0H	61120	EEC0H		Connection status	Read
53185	CFC1H	61121	EEC1H	Own node operation status storage area (switching hub connection information area)	Communication speed	Read
53186	CFC2H	61122	EEC2H		Disconnection count	Read
53187 to 53191	CFC3H to CFC7H	61123 to 61127	EEC3H to EEC7H		System area	
53192	CFC8H	61128	EEC8H		P1: Own node operation status storage area (IP address duplication status storage area)	Read
53193 to 53195	CFC9H to CFCBH	61129 to 61131	EEC9H to EECBH	P2: System area	MAC address of the station already connected to the network	Read
53196 to 53198	CFCCH to CFCEH	61132 to 61134	EECCH to EECEH		MAC address of the station with the IP address already used	Read
53199 to 53291	CFCFH to D02BH	61135 to 61227	EECFH to EF2BH		System area	

P1		P2		Name	Read, write			
Address (decimal)	Address (hexadecimal)	Address (decimal)	Address (hexadecimal)		System area	Read		
53292	D02CH	61228	EF2CH	P1: Area for sending/receiving instructions P2: System area	System area			
53293	D02DH	61229	EF2DH		RECV instruction execution request	Read		
53294 to 53319	D02EH to D047H	61230 to 61255	EF2EH to EF47H		System area			
53320 to 53617	D048H to D171H	61256 to 61553	EF48H to F071H	System area				
53618 to 53621	D172H to D175H	61554 to 61557	F072H to F075H	Remote password lock status storage area	System area			
53622	D176H	61558	F076H		Remote password lock status system port	Read		
53623 to 59575	D177H to E8B7H	61559 to 67511	F077H to 107B7H	System area				
59576 to 59639	E8B8H to E8F7H	67512 to 67575	107B8H to 107F7H	Remote password function monitoring area	System area			
59640	E8F8H	67576	107F8H		Auto-open UDP port continuous unlock failure count	Read		
59641	E8F9H	67577	107F9H		MELSOFT transmission port (UDP/IP) continuous unlock failure count	Read		
59642	E8FAH	67578	107FAH		MELSOFT transmission port (TCP/IP) continuous unlock failure count	Read		
59643 to 59644	E8FBH to E8FCH	67579 to 67580	107FBH to 107FCH		System area			
59645	E8FDH	67581	107FDH		SLMP transmission port (UDP/IP) continuous unlock failure count	Read		
59646	E8FEH	67582	107FEH		SLMP transmission port (TCP/IP) continuous unlock failure count	Read		
59647 to 59661	E8FFH to E90DH	67583 to 67597	107FFH to 1080DH		System area			
59662 to 59934	E90EH to EA1EH	67598 to 67870	1080EH to 1091EH	System area				
59935	EA1FH	67871	1091FH	P1: Network type information area (Network type information) P2: System area	Read			
59936 to 60163	EA20H to EB03H	67872 to 68096	10920H to 10A00H	System area				
68097 to 68119	10A01H to 10A17H	←		System area				
68120	10A18H	←		Ethernet P1/2 common information	Initial status	Read		
68121	10A19H	←			Initial error code	Read		
68122 to 68125	10A1AH to 10A1DH	←		System area				
68126	10A1EH	←		Receive buffer status storage area (Receive buffer status)		Read		
68127 to 100351	10A1FH to 187FFH	←		System area				



- Do not write data to "system areas". Doing so may cause malfunction of the programmable controller system.
- If the value in an area of one word becomes equal to or higher than 65536, the count stops at 65535 (FFFFH).

Details of buffer memory addresses

Module information area

■Latest error code (Un\G29)

The error code for the latest error that occurred in the FX5-CCLGN-MS is stored. (0 is stored in normal condition.)

For details on error codes, refer to the following.

☞ Page 159 List of Error Codes

■Unique code (Un\G30)

The unique code (6988H) of the FX5-CCLGN-MS is stored.

■Firmware version (Un\G31)

The firmware version of the FX5-CCLGN-MS is stored.

Ex.

When the firmware version of the FX5-CCLGN-MS is Ver.1.000: K1000

■Input signal (Un\G34 to Un\G35)

This signal is used to check the status of the FX5-CCLGN-MS.

Address	Bit	Signal name	Description
Un\G34	b0	Module failure	<ul style="list-style-type: none"> Off: Module normal On: Module failure
	b1	Own station data link status	<ul style="list-style-type: none"> Off: Data link stop On: Data link in progress <p>Shows the data link status of the own station in the same way as 'Data link error status of own station' (SB0049). However, the ON/OFF status is reversed between this bit and 'Data link error status of own station' (SB0049).</p>
	b3	Data link status of another station	<ul style="list-style-type: none"> Off: All stations normal On: Faulty station exists <p>The specifications are the same as the specifications for 'Data link error status of each station' (SB00B0).</p>
	b15	Module READY	<ul style="list-style-type: none"> Off: Module not in operation On: Available for module operation <p>When b0 of Un\G34 turns on, this bit turns off.</p>

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Device area

The RX, RY, RWw, RWr, SB, and SW values are stored.

■Remote input (RX) (Un\G256 to Un\G1279)

The RX value is stored. The RX start number and number of points for each station number can be checked by the RX offset/size information (Un\G23808 to Un\G24831). (☞ Page 191 RX offset/size information)

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G256	RX F	RX E	RX D	RX C	RX B	RX A	RX 9	RX 8	RX 7	RX 6	RX 5	RX 4	RX 3	RX 2	RX 1	RX 0
⋮																
Un\G1279	RX 3FFF	RX 3FFE	RX 3FFD	RX 3FFC	RX 3FFB	RX 3FFA	RX 3FF9	RX 3FF8	RX 3FF7	RX 3FF6	RX 3FF5	RX 3FF4	RX 3FF3	RX 3FF2	RX 3FF1	RX 3FF0

Each bit corresponds to 1 bit of RX.

■Remote output (RY) (Un\G1280 to Un\G2303)

The RY value is stored. The RY start number and number of points for each station number can be checked by the RY offset/size information (Un\G24832 to Un\G25855). (☞ Page 191 RY offset/size information)

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G1280	RY F	RY E	RY D	RY C	RY B	RY A	RY 9	RY 8	RY 7	RY 6	RY 5	RY 4	RY 3	RY 2	RY 1	RY 0
:																
Un\G2303	RY 3FFF	RY 3FFE	RY 3FFD	RY 3FFC	RY 3FFB	RY 3FFA	RY 3FF9	RY 3FF8	RY 3FF7	RY 3FF6	RY 3FF5	RY 3FF4	RY 3FF3	RY 3FF2	RY 3FF1	RY 3FF0

Each bit corresponds to 1 bit of RY.

■Remote register (RWw) (Un\G2304 to Un\G10495)

The RWw value is stored. The RWw start number and number of points for each station number can be checked by the RWw offset/size information (Un\G25856 to Un\G26879). (☞ Page 192 RWw offset/size information)

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G2304	RWw0															
Un\G2305	RWw1															
:																
Un\G10495	RWw1FFF															

■Remote register (RWr) (Un\G10496 to Un\G18687)

The RWr value is stored. The RWr start number and number of points for each station number can be checked by the RWr offset/size information (Un\G26880 to Un\G27903). (☞ Page 192 RWr offset/size information)

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G10496	RWr0															
Un\G10497	RWr1															
:																
Un\G18687	RWr1FFF															

■Link special relay (SB) (Un\G18688 to Un\G18943)

The SB value is stored.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G18688	SBF	SBE	SBD	SBC	SBB	SBA	SB9	SB8	SB7	SB6	SB5	SB4	SB3	SB2	SB1	SB0
:																
Un\G18943	SBFF F	SBFF E	SBFF D	SBFF C	SBFF B	SBFF A	SBFF 9	SBFF 8	SBFF 7	SBFF 6	SBFF 5	SBFF 4	SBFF 3	SBFF 2	SBFF 1	SBFF 0

Each bit corresponds to 1 bit of SB.

■Link special register (SW) (Un\G18944 to Un\G23039)

The SW value is stored.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G18944	SW0															
Un\G18945	SW1															
:																
Un\G23039	SWFFF															

Timeslot information

■Timeslot 0 information (Un\G23552 to Un\G23567)

Cycle start offset (ns, s unit) of Timeslot 0 and cycle end offset (ns, s unit) are stored.

Address	Name	Description
Un\G23552 to Un\G23553	Cycle start offset (ns unit)	The ns digits of cycle start offset are stored. Stored range: 0 to 999999999ns
Un\G23554	Cycle start offset (s unit)	The s digits of cycle start offset are stored. Stored range: 0 to 65535s
Un\G23555	System area	
Un\G23556 to Un\G23557	Cycle end offset (ns unit)	The ns digits of cycle end offset are stored. Stored range: 0 to 999999999ns
Un\G23558	Cycle end offset (s unit)	The s digits of cycle end offset are stored. Stored range: 0 to 65535s
Un\G23559 to Un\G23567	System area	

■Timeslot 1 to 7 information (Un\G23568 to Un\G23679)

Timeslot 1 to 7 information is stored in the same order as Timeslot 0 information.

RX offset/size information

■RX offset/size information (Un\G23808 to Un\G24831)

The start number and the number of points of RX for each station are stored.

Address	Description
Un\G23808 to Un\G23809	Station No.0 offset
Un\G23810 to Un\G23811	Station No.0 size (in units of words)
Un\G23812 to Un\G23813	Station No.1 offset
Un\G23814 to Un\G23815	Station No.1 size (in units of words)
:	
Un\G24288 to Un\G24289	Station No.120 offset
Un\G24290 to Un\G24291	Station No.120 size (in units of words)
Un\G24292 to Un\G24831	System area

The buffer memory address for the offset and size of each station number can be calculated using the following formulas:

- Offset buffer memory address = 23808 + (station No.) × 4
- Size buffer memory address = 23810 + (station No.) × 4

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RY offset/size information

■RY offset/size information (Un\G24832 to Un\G25855)

The start number and the number of points of RY for each station are stored.

Address	Description
Un\G24832 to Un\G24833	Station No.0 offset
Un\G24834 to Un\G24835	Station No.0 size (in units of words)
Un\G24836 to Un\G24837	Station No.1 offset
Un\G24838 to Un\G24839	Station No.1 size (in units of words)
:	
Un\G25312 to Un\G25313	Station No.120 offset
Un\G25314 to Un\G25315	Station No.120 size (in units of words)
Un\G25316 to Un\G25855	System area

The buffer memory address for the offset and size of each station number can be calculated using the following formulas:

- Offset buffer memory address = 24832 + (station No.) × 4
- Size buffer memory address = 24834 + (station No.) × 4

RWw offset/size information

■RWw offset/size information (Un\G25856 to Un\G26879)

The start number and the number of points of RWw for each station are stored.

Address	Description
Un\G25856 to Un\G25857	Station No.0 offset
Un\G25858 to Un\G25859	Station No.0 size (in units of words)
Un\G25860 to Un\G25861	Station No.1 offset
Un\G25862 to Un\G25863	Station No.1 size (in units of words)
:	
Un\G26336 to Un\G26337	Station No.120 offset
Un\G26338 to Un\G26339	Station No.120 size (in units of words)
Un\G26340 to Un\G26879	System area

The buffer memory address for the offset and size of each station number can be calculated using the following formulas:

- Offset buffer memory address = 25856 + (station No.) × 4
- Size buffer memory address = 25858 + (station No.) × 4

RWr offset/size information

■RWr offset/size information (Un\G26880 to Un\G27903)

The start number and the number of points of RWr for each station are stored.

Address	Description
Un\G26880 to Un\G26881	Station No.0 offset
Un\G26882 to Un\G26883	Station No.0 size (in units of words)
Un\G26884 to Un\G26885	Station No.1 offset
Un\G26886 to Un\G26887	Station No.1 size (in units of words)
:	
Un\G27360 to Un\G27361	Station No.120 offset
Un\G27362 to Un\G27363	Station No.120 size (in units of words)
Un\G27364 to Un\G27903	System area

The buffer memory address for the offset and size of each station number can be calculated using the following formulas:

- Offset buffer memory address = 26880 + (station No.) × 4
- Size buffer memory address = 26882 + (station No.) × 4

Own station information

The information of the own station on the network is stored.

■Own station (network card) information (Un\G28160 to Un\G28167)

Address	Name	Description
Un\G28160	Manufacturer code	The FX5-CCLGN-MS information of the own station is stored. (Also used in the CLPA conformance test.) (Updated even if set as an error invalid station.) (Updated even if set as a reserved station.)
Un\G28161	Model type	
Un\G28162	Model code (lower 2 bytes)	
Un\G28163	Model code (upper 2 bytes)	
Un\G28164	Version	
Un\G28165 to Un\G28167	MAC address	The own station MAC address is stored. Un\G28165: 5th byte, 6th byte of the MAC address Un\G28166: 3rd byte, 4th byte of the MAC address Un\G28167: 1st byte, 2nd byte of the MAC address

■Own station (controller) information (Un\G28168 to Un\G28191)

Address	Name	Description
Un\G28168	Controller information valid/invalid flag	Whether the value stored in the own station (controller) information is valid or invalid is stored. • 0: Invalid • 1: Valid
Un\G28169	Manufacturer code	The FX5-CCLGN-MS information of the own station is stored.
Un\G28170	Model type	
Un\G28171	Model code (lower 2 bytes)	
Un\G28172	Model code (upper 2 bytes)	
Un\G28173	Version	
Un\G28174 to Un\G28183	Model name string	
Un\G28184 to Un\G28185	Vendor-specific device information	
Un\G28186 to Un\G28191	System area	

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Communication path determination status

■Communication path determination status (Un\G36608 to Un\G36623)

The determination information on the communication path for each network number of the destination station is stored.

- 0: Path undetermined
- 1: Path determined

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G36608	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
⋮																
Un\G36622	Empty	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225
Un\G36623	Empty															

The numbers in the table indicate network numbers.

Time synchronization

■Time distribution interval setting of the CPU module (Un\G51200)

This setting specifies the interval for distributing the clock time of the CPU module on the same system as the master module from the master station to slave stations.

When the setting is changed, the new setting value is enabled after the interval of the distribution operating with the old setting value has elapsed. The setting value is distributed once after the distribution interval elapses. If the new setting value needs to be enabled immediately, stop the distribution and set the value.

- 0000H: 10s
- 0001H to FFFEH: Send using the set time interval (second).
- FFFFH: Distribution stop

■Time reflection setting to the CPU module (Un\G51201)

- 0000H: Do not reflect the time in the CPU module.*^{1*2}

- 0001H: Reflect the time to the CPU module.

*1 The time that was set to the CPU module on the local station is used for operation.

*2 This setting reflects the time in the CPU module of the local station. Even if 0001H is set for this buffer memory area by the master station side, the time is not reflected in the CPU module of the local station.

Grandmaster information

The grandmaster status of the own station and MAC address are stored.

■Grandmaster (Un\G51968)

When the own station is the grandmaster, "1" is stored.

- 0: Another station is the grandmaster.
- 1: Own station is the grandmaster.

■Grandmaster MAC address (Un\G51971 to Un\G51973)

The grandmaster MAC address is stored.

- Un\G51971: 5th byte, 6th byte of the MAC address
- Un\G51972: 3rd byte, 4th byte of the MAC address
- Un\G51973: 1st byte, 2nd byte of the MAC address

Time synchronization setting

■PTP frame send source check enable/disable (Un\G51997)

- 0: Do not check
- 1: Check

■PTP frame send source check result (P1) (Un\G51998)

- 0: One send source
- 1: Two or more send sources

■PTP frame send source check result (P2) (Un\G51999)

- 0: One send source
- 1: Two or more send sources

Own node setting status storage area

■Own node IP address (Un\G52228 to Un\G52229)

The setting values of the IP address are stored.

Range: 1H to DFFFFFFEH

■Subnet mask (Un\G52238 to Un\G52239)

The setting values of the subnet mask are stored.

Range: 1H to FFFFFFFFH

0: No setting

■Default gateway IP address (Un\G52242 to Un\G52243)

The setting values of the default gateway are stored.

Range: 1H to DFFFFFFEH

0: No setting

■Own node MAC address (Un\G52252 to Un\G52254)

The own node MAC addresses are stored.

- Un\G52252: 5th byte, 6th byte of the MAC address
- Un\G52253: 3rd byte, 4th byte of the MAC address
- Un\G52254: 1st byte, 2nd byte of the MAC address

■Own node network number (Un\G52255)

The setting value of the network number is stored.

Range: 1 to 239

0: Network number not set

■Station number (Un\G52256)

The setting value of the station number is stored.

Range: 1 to 120

0: Station number not set

125: Master station

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■Transient transmission group No. (Un\G52257)

The setting value of the transient transmission group number is stored.

Range: 1 to 32

0: No group specification

■Auto-open UDP port port number (Un\G52261)

The port number used for the auto-open UDP port is stored.

■MELSOFT transmission port (TCP/IP) port number (Un\G52262)

The port number used for the MELSOFT transmission port (TCP/IP) is stored.

■MELSOFT transmission port (UDP/IP) port number (Un\G52263)

The port number for the MELSOFT transmission port (UDP/IP) is stored.

■SLMP transmission port (TCP/IP) port number (Un\G52265)

The port number used for the SLMP transmission port (TCP/IP) is stored.

■SLMP transmission port (UDP/IP) port number (Un\G52266)

The port number used for the SLMP transmission port (UDP/IP) is stored.

Connection status storage area

■Latest error code after the 2nd connection of MELSOFT transmission port (TCP/IP) (Un\G52452 to Un\G52458)

The latest error code of the 2nd to 8th connection of the MELSOFT transmission port (TCP/IP) is stored.

■Latest error code after the 2nd connection of SLMP transmission port (TCP/IP) (Un\G52580 to Un\G52586)

The latest error code of the 2nd to 8th connection of the SLMP transmission port (TCP/IP) is stored.

System port latest error code storage area

■Auto-open UDP port latest error code (Un\G52738)

The latest error code of the auto-open UDP port is stored.

■MELSOFT transmission port (UDP/IP) latest error code (Un\G52739)

The latest error code of the MELSOFT transmission port (UDP/IP) is stored.

■MELSOFT transmission port (TCP/IP) latest error code (Un\G52740)

The latest error code of the MELSOFT transmission port (TCP/IP) is stored.

■SLMP transmission port (UDP/IP) latest error code (Un\G52741)

The latest error code of the SLMP transmission port (UDP/IP) is stored.

■SLMP transmission port (TCP/IP) latest error code (Un\G52742)

The latest error code of the SLMP transmission port (TCP/IP) is stored.

■SLMPSND instruction latest error code (Un\G52743)

The latest error code of the SLMPSND instruction is stored.

Status for each protocol (IP packet)

■Received packet total count (Un\G52992 to Un\G52993, Un\G60928 to Un\G60929)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■Received packet checksum error discard count (Un\G52994 to Un\G52995, Un\G60930 to Un\G60931)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■Sent packet total count (Un\G52996 to Un\G52997, Un\G60932 to Un\G60933)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■Simultaneous transmission error detection count (receive buffer full count) (Un\G53014 to Un\G53015, Un\G60950 to Un\G60951)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■Receive abort count (Un\G53021, Un\G60957)

The status is counted from 0 to 65535 (FFFFH).

Status for each protocol (ICMP packet)

■ Received packet total count (Un\G53032 to Un\G53033, Un\G60968 to Un\G60969)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Received packet checksum error discard count (Un\G53034 to Un\G53035, Un\G60970 to Un\G60971)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Sent packet total count (Un\G53036 to Un\G53037, Un\G60972 to Un\G60973)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Received echo request total count (Un\G53038 to Un\G53039, Un\G60974 to Un\G60975)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Sent echo reply total count (Un\G53040 to Un\G53041, Un\G60976 to Un\G60977)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Sent echo request total count (Un\G53042 to Un\G53043, Un\G60978 to Un\G60979)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Received echo reply total count (Un\G53044 to Un\G53045, Un\G60980 to Un\G60981)

The status is counted from 0 to 4294967295 (FFFFFFFH).

Status for each protocol (TCP packet)

■ Received packet total count (Un\G53072 to Un\G53073, Un\G61008 to Un\G61009)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Received packet checksum error discard count (Un\G53074 to Un\G53075, Un\G61010 to Un\G61011)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Sent packet total count (Un\G53076 to Un\G53077, Un\G61012 to Un\G61013)

The status is counted from 0 to 4294967295 (FFFFFFFH).

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Status for each protocol (UDP packet)

■ Received packet total count (Un\G53112 to Un\G53113, Un\G61048 to Un\G61049)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Received packet checksum error discard count (Un\G53114 to Un\G53115, Un\G61050 to Un\G61051)

The status is counted from 0 to 4294967295 (FFFFFFFH).

■ Sent packet total count (Un\G53116 to Un\G53117, Un\G61052 to Un\G61053)

The status is counted from 0 to 4294967295 (FFFFFFFH).

Own node operation status storage area (LED on/off status)

■ Own node operation status storage area (LED on/off status) (Un\G53181)

ERROR LED (b0)

- 0: Off
- 1: On/flashing

Own node operation status storage area (switching hub connection information area)

■Communication mode (Un\G53183, Un\G61119)

- 0: Half-duplex
- 1: Full-duplex

■Connection status (Un\G53184, Un\G61120)

- 0: Switching hub not connected/disconnected
- 1: Switching hub connected

■Communication speed (Un\G53185, Un\G61121)

- 2: Operating at 1000BASE-T

■Disconnection count (Un\G53186, Un\G61122)

The number of times the cable was disconnected is stored.

Own node operation status storage area (IP address duplication status storage area)

■IP address duplication flag (Un\G53192)

- 0: IP address not duplicated
- 1: IP address duplicated

■MAC address of the station already connected to the network (Un\G53193 to Un\G53195)

It is stored in the station with duplicated IP address.

■MAC address of the station with the IP address already used (Un\G53196 to Un\G53198)

It is stored in the station that has been already connected to the network.

Area for sending/receiving instructions

■RECV instruction execution request (Un\G53293)

RECV instruction execution request

- 0: No request
- 1: Requesting

Channels 1 to 8 are displayed in units of bits.

Remote password lock status storage area

■Remote password lock status system port (Un\G53622, Un\G61558)

[b0]: Auto-open UDP port

[b1]: MELSOFT transmission port (UDP/IP)

[b2]: MELSOFT transmission port (TCP/IP)

[b5]: SLMP transmission port (UDP/IP)

[b6]: SLMP transmission port (TCP/IP)

- 0: Unlocked/remote password not set
- 1: Lock status

Remote password function monitoring area

■Auto-open UDP port continuous unlock failure count (Un\G59640, Un\G67576)

The mismatch count of remote password at unlock of the auto-open UDP port is stored. The count is cleared when the password matches.

Range: 0 to 65535 (Values of 65535 or more are not changed)

■MELSOFT transmission port (UDP/IP) continuous unlock failure count (Un\G59641, Un\G67577)

The mismatch count of remote password at unlock of the MELSOFT transmission port (UDP/IP) is stored. The count is cleared when the password matches.

Range: 0 to 65535 (Values of 65535 or more are not changed)

■MELSOFT transmission port (TCP/IP) continuous unlock failure count (Un\G59642, Un\G67578)

The mismatch count of remote password at unlock of the MELSOFT transmission port (TCP/IP) is stored. The count is cleared when the password matches.

Range: 0 to 65535 (Values of 65535 or more are not changed)

■SLMP transmission port (UDP/IP) continuous unlock failure count (Un\G59645, Un\G67581)

The mismatch count of remote password at unlock of the SLMP transmission port (UDP/IP) is stored. The count is cleared when the password matches.

Range: 0 to 65535 (Values of 65535 or more are not changed)

■SLMP transmission port (TCP/IP) continuous unlock failure count (Un\G59646, Un\G67582)

The mismatch count of remote password at unlock of the SLMP transmission port (TCP/IP) is stored. The count is cleared when the password matches.

Range: 0 to 65535 (Values of 65535 or more are not changed)

Network type information area

A

■Network type information (Un\G59935)

- 5: CC-Link IE TSN

Ethernet P1/2 common information

■Initial status (Un\G68120)

The initial processing status of the FX5-CCLGN-MS Ethernet connection is stored.

[b0]: Initial normal completion status

- 0: —
- 1: Initialization normal completion

[b1]: Initial abnormal completion status

- 0: —
- 1: Initialization abnormal completion

[b2 to b15]: Not used (Use prohibited)

■Initial error code (Un\G68121)

The information when the initial processing is completed with an error is stored.

- 0: In initial processing or initial normal completion
- 1 or more: Initialization abnormal code

Receive buffer status storage area

■Receive buffer status (Un\G68126)

The receive buffer status is stored.

- 0: Receive buffer not full
- 1: Receive buffer full

Appendix 4 List of Link Special Relay (SB)

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 link special relay (SB)

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

Refresh of link special relay (SB)

To use link special relay (SB), set them in "Refresh Settings" under "Basic Settings" so that they are refreshed to the devices of the FX5 CPU module. ( Page 93 Refresh settings)

Ranges turned on/off by users and by the system

The following ranges correspond to when the link special relay areas (SB) are assigned from SB0000 to SB0FFF.

- Turned on/off by users: SB0000 to SB001F
- Turned on/off by the system: SB0020 to SB0FFF

List of link special relay (SB)

The following table lists the link special relay areas (SB) when they are assigned from SB0000 to SB0FFF.



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

No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SB0006	Clear communication error count	Clears the link special register areas related to communication errors (SW0074 to SW0077, SW007C to SW007F) to 0. Off: Clear not requested On: Clear requested (valid while on)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0014	Cyclic data receive status clear	Clears 'Cyclic data receive status' (SB0064). While 'Cyclic data receive status clear' (SB0014) is on, the cyclic data receive status does not turn on. Off: Clear not requested On: Clear requested (enabled while on)	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
SB0030	RECV execution request flag CH1	Stores the data reception status of own station channel 1. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0031	RECV execution request flag CH2	Stores the data reception status of own station channel 2. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0032	RECV execution request flag CH3	Stores the data reception status of own station channel 3. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0033	RECV execution request flag CH4	Stores the data reception status of own station channel 4. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0034	RECV execution request flag CH5	Stores the data reception status of own station channel 5. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0035	RECV execution request flag CH6	Stores the data reception status of own station channel 6. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0036	RECV execution request flag CH7	Stores the data reception status of own station channel 7. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0037	RECV execution request flag CH8	Stores the data reception status of own station channel 8. Off: No data received On: Data received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0040	Network type of own station	Stores the network type of the own station. ON: CC-Link IE TSN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0043	Module operation mode of own station	Stores the module operation mode of the own station. Off: Online mode On: Other than online mode	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0044	Station setting 1 of own station	Stores the station type of the own station. Off: Slave station (other than the master station) On: Master station	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0045	Station setting 2 of own station	Stores the communication mode of the own station. Off: Unicast mode On: Multicast mode	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB0046	Station number setting status of own station	Stores the station number setting status. Off: Station number set On: Station number not set (local station only) If parameters are set using the engineering tool, this relay is always off.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SB0049	Data link error status of own station	<p>Stores the data link error 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. (Also used in the CLPA conformance test.) (Updated even if set as an error invalid station.)</p>	○	○	○
SB004A	CPU minor error status of own station	<p>Stores the minor error status of the FX5 CPU module on the own station. Off: No minor error On: Minor error</p>	○	○	○
SB004B	CPU moderate/major error status of own station	<p>Stores the moderate/major error status of the FX5 CPU module on the own station. Off: No moderate/major error On: Moderate/major error</p>	○	○	○
SB004C	CPU operating status of own station	<p>Stores the operating status of the FX5 CPU module on the own station. OFF: RUN On: STOP, PAUSE, or moderate/major error</p>	○	○	○
SB004D	Received parameter error	<p>Stores the status of received parameter. (For the master station, this relay stores the parameter status of the own station) Off: Normal On: Error</p>	○	○	○
SB004F	Station number status of the operating station	<p>Stores the station number setting method as follows when the station type of the own station is local station. Off: Set by parameters On: Set by program</p>	×	○	○
SB0064	Cyclic data receive status	<p>Shows the receive status in the communication cycle in which the cyclic data from the slave station is set using "Disconnection Detection Setting" in the master station. Off: Cyclic data received On: Cyclic data not received consecutively (Conditions)<ul style="list-style-type: none">• This relay turns on when an error is detected for one or more stations by an alive check.• Reserved stations and stations that surpass the maximum station number are ignored.(Also used in the CLPA conformance test.) (Updated even if set as an error invalid station.) (Updated even if set as a reserved station.)</p>	○	×	×
SB006A	PORT1 link-down status of own station	<p>Stores the link-down status of the own station P1 side. Off: Link-up On: Link-down The time until link-up starts after power-on or Ethernet cable connection may vary. Normally link-up takes several seconds. Depending on device status on the line, link-up processing is repeated and may increase the time. (Also used in the CLPA conformance test.) (Updated even if set as an error invalid station.) (Updated even if set as a reserved station.)</p>	○	○	○
SB006B	PORT2 link-down status of own station	<p>Stores the link-down status of the own station P2 side. Off: Link-up On: Link-down The time until link-up starts after power-on or Ethernet cable connection may vary. Normally link-up takes several seconds. Depending on device status on the line, link-up processing is repeated and may increase the time. (Also used in the CLPA conformance test.) (Updated even if set as an error invalid station.) (Updated even if set as a reserved station.)</p>	○	○	○

No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SB0074	Reserved station specification status	Stores the status of reserved station specification by parameter. The station number of the station set as a reserved station can be checked with 'Reserved station setting status' (SW00C0 to SW00C7). Off: Not specified On: Specified	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/> *1
SB0075	Error invalid station setting status	Stores the status of error invalid station setting by parameter. The station number of the station set as an error invalid station can be checked with 'Error invalid station setting status' (SW00D0 to SW00D7). Off: Not specified On: Specified	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/> *1
SB0077	Parameter reception status	Stores the status of parameter reception from the master station. Off: Reception complete On: Reception not completed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB007B	Input data status of data link faulty station	Stores the setting status of "Data link faulty station setting" of the own station. Off: Clear On: Hold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB007D	Hold/clear status setting for CPU STOP	Stores the setting status of "Output Hold/Clear Setting during CPU STOP" of the own station. Off: Hold On: Clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB007E	Type of IP Address	Stores the type of IP address. OFF: IPv4 ON: IPv6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SB007F	IP address setting status	Stores the status of the IP address setting by parameter. Off: No setting On: Set For local stations, this relay stores the acceptance status of the IP address from the master station.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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. Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, "0: Data link normally operating station" is reflected to the remote station. (Conditions) Reserved stations and stations that surpass the maximum station number are ignored.	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/> *1
SB00B1	Data link error status of master station	Stores the data link status of the master station. Off: Normal On: Error	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/> *1
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 refresh timing, the update of 'Reserved station setting status' (SW00C0 to SW00C7) may be offset by one sequence scan.	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/> *1

No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SB00D0	Error invalid station setting current status	<p>Set whether an error invalid station is set. Off: No setting On: Set</p> <p>When this relay is turned on, the status of each station can be checked with 'Error invalid station setting status' (SW00D0 to SW00D7).</p> <p>Depending on the refresh timing, the update of 'Error invalid station setting status' (SW00D0 to SW00D7) may be offset by one sequence scan.</p>	○	×	○*1
SB00E8	Station type match status of each station	<p>Shows the station type match status of each station. 0: Station types of all stations match 1: Station type mismatch exists.</p> <p>This relay is turned to "0: Station types of all stations match" when all areas of 'Station type match status' (SW00E8 to SW00EF) are "0: Station type match".</p> <p>Depending on the refresh timing, the update of 'Station type match status' (SW00E8 to SW00EF) may be offset by one sequence scan.</p>	○	×	○*1
SB00F0	CPU operating status of each station	<p>Stores the operating status of the CPU module on each station. Off: All stations at RUN or PAUSE state On: Station at STOP state, or station with a moderate/major error exists.</p> <p>When this relay is turned on, the status of each station can be checked with 'CPU operating status of each station' (SW00F0 to SW00F7).</p> <p>Depending on the refresh timing, the update of 'CPU operating status of each station' (SW00F0 to SW00F7) may be offset by one sequence scan.</p> <p>Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, "0: RUN, PAUSE" is reflected to the remote station.</p>	○	×	○*1
SB00F1	CPU operating status of master station	<p>Stores the operating status of the CPU module on the master station (master operating station). Off: RUN or PAUSE state On: STOP state, or moderate/major error</p>	○	×	○*1
SB0100	CPU moderate/major error status of each station	<p>For local stations, stores the moderate/major error occurrence status of the CPU module on each station. For remote stations, stores the moderate/major error occurrence status of each station.</p> <p>Off: No station with a moderate/major error On: Station with a moderate/major error exists</p> <p>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).</p> <p>Depending on the refresh timing, the update of 'CPU moderate/major error status of each station' (SW0100 to SW0107) may be offset by one sequence scan.</p> <p>Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, "0: No moderate/major error" is reflected to the remote station.</p>	○	×	○*1
SB0101	CPU moderate/major error status of master station	<p>Stores the moderate/major error occurrence status of the CPU module on the master station (master operating station). Off: No moderate/major error On: Moderate/major error</p>	○	×	○*1

No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SB0110	CPU minor error status of each station	<p>For local stations, stores the minor error occurrence status of the CPU module on each station.</p> <p>For remote stations, stores the minor error occurrence status of each station.</p> <p>Off: All stations normal or station with a moderate/major error exists.</p> <p>On: Station with a minor error exists.</p> <p>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).</p> <p>Depending on the refresh timing, the update of 'CPU minor error status of each station' (SW0110 to SW0117) may be offset by one sequence scan.</p> <p>Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, "0: Normal or moderate/major error occurring" is reflected to the remote station.</p>	○	×	○*1
SB0111	CPU minor error status of master station	<p>Stores the minor error occurrence status of the CPU module on the master station (master operating station).</p> <p>Off: No minor error or a moderate/major error</p> <p>On: Minor error</p>	○	×	○*1

*1 This register is enabled when 'Data link status of own station' (SB0049) is off.

Appendix 5 List of Link Special Register (SW)

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

Application of link special register (SW)

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

Refresh of link special register (SW)

To use link special register (SW), set them in "Refresh Settings" under "Basic Settings" so that they are refreshed to the devices of the FX5 CPU module. (☞ Page 93 Refresh settings)

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

The following ranges correspond to when the link special register areas (SW) are assigned from SW0000 to SW0FFF.

- Stored by users: SW0000 to SW001F
- Stored by the system: SW0020 to SW0FFF

List of link special register (SW)

The following table lists the link special register areas (SW) when they are assigned from SW0000 to SW0FFF.

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.

No.	Name	Description	Availability								
			Master station	Local station							
				Unicast mode	Multicast mode						
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 successfully 1 or greater: Completed with an error (Error code is stored.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
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 successfully 1 or greater: Completed with an error (Error code is stored.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
SW0040	Network number	Stores the network number of the own station. Range: 1 to 239	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
SW0042	Station number	Stores the station number of the own station. Master station range: 125 Local station range: 1 to 120, 255 (station number not set)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
SW0043	Mode status of own station	Stores the module operation mode setting or communication mode setting of the own station. 0: Online mode/Unicast mode 1: Online mode/Multicast mode 2: Offline mode B: Module communication test mode	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> *1						
SW0045	Module type	Stores the hardware status of the own station. Model type (b1, b0) 00: Module 01: Board 10: HMI (Human Machine Interface)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
SW0046 to SW0047	IPv4 address	Shows the IP address (IPv4) set in the own station. <table border="1"><tr><td>SW0046</td><td>(1)</td><td>(2)</td></tr><tr><td>SW0047</td><td>(3)</td><td>(4)</td></tr></table>	SW0046	(1)	(2)	SW0047	(3)	(4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW0046	(1)	(2)									
SW0047	(3)	(4)									
SW0049	Cause of data link stop	Stores the cause that stopped the data link of the own station. 00H: At normal communication or power-on 02H: Monitoring time timeout 05H: No slave station (master station only) 10H: Parameter not received (local station only) 11H: Outside the range of own station numbers 12H: Reserved station setting of own station (local station only) 14H: Master station duplication (master station only) 16H: Station number not set (local station only) 18H: Parameter error 19H: Parameter communication in progress 20H: CPU module moderate error, major error 60H: Illegal ring topology (master station only) (Also used in the CLPA conformance test.) (Updated even if set as an error invalid station.) (Updated even if set as a reserved station.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						

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No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SW004B	CPU status of own station	Stores the status of the FX5 CPU module on the own station. 00H: No CPU 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 in progress	○	○	○
SW004C	Parameter setting status	Stores the status of parameter settings. 0: Normal 1 or greater: Error definition (Error code is stored.) (Conditions) • This register is enabled when 'Received parameter error' (SB004D) is on.	○	○	○
SW0058	Total number of slave stations setting value	Stores the total number of slave stations that are set by the parameters. Range: 1 to 120	○	○	○
SW0059	Total number of slave stations present value	Stores the total number of slave stations that are actually connected by data link. Range: 1 to 120 (0 when own station is disconnected) Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, the remote station is reflected as a station that is being performed data link normally.	○	×	○ ^{*1}
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 (0 when own station is disconnected) Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, the remote station is reflected as a station that is being performed data link normally. (Conditions) • This register is enabled when 'Data link error status of own station' (SB0049) is off.	○	×	○ ^{*1}
SW0060	Communication cycle intervals	Stores the setting value of "Communication Period Interval Setting" set with the module parameter of the master station. (Unit: μ s)	○	○	○
SW0061	System reserved time	Stores the setting value of "System Reservation Time" set with the module parameter of the master station. (Unit: μ s)	○	○	○
SW0062	Cyclic transmission time	Stores the setting value of "Cyclic Transmission Time" set with the module parameter of the master station. (Unit: μ s)	○	○	○
SW0063	Transient transmission time	Stores the setting value of "Transient Transmission Time" set with the module parameter of the master station. (Unit: μ s)	○	○	○
SW0064	Multiple cycle setting (medium speed)	Stores the setting value of "Multiple Period Setting (Normal-Speed)" set with the module parameter of the master station.	○	○	○
SW0065	Multiple cycle setting (low speed)	Stores the setting value of "Multiple Period Setting (Low-Speed)" set with the module parameter of the master station.	○	○	○
SW0066	Connection status of own station	Stores the connection status of the own station. 00H: Normal (communication in progress on P1 and P2) 01H: Normal (communication in progress on P1, cable disconnected on P2) 10H: Normal (cable disconnected on P1, communication in progress on P2) 11H: Disconnected (cable disconnected on P1 and P2) 12H: Disconnected (cable disconnected on P1, establishing line on P2) 21H: Disconnected (establishing line on P1, cable disconnected on P2) 22H: Disconnected (establishing line on P1 and P2)	○	○	○
SW0072	Communication cycle intervals (calculation value)	Stores the communication cycle intervals calculated by the number of slave stations and the number of points that are set in "Network Configuration Settings" under "Basic Settings". (Unit: μ s)	○	○	○

No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SW0073	Cyclic transmission time (calculation value)	Stores the cyclic transmission time calculated by the number of slave stations and the number of points that are set in "Network Configuration Settings" under "Basic Settings". (Unit: μ s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW0074	PORT1 cable disconnection detection count	Stores the cumulative count that was detected for cable disconnections at the P1 side. When 'Clear communication error count' (SB0006) is turned on, the stored count is cleared. When FFFFH (maximum value 65535) is counted, the value returns to 0 and the module continues to count.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW0075	PORT1 receive error detection count	Stores the cumulative count that error data was received at the P1 side. The count stores only error data that is not transmitted to all stations. When 'Clear communication error count' (SB0006) is turned on, the stored count is cleared. When FFFFH (maximum value 65535) is counted, counting stops.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW0076	PORT1 total number of received data (lower 1 word)	Stores the cumulative count that data was received at the P1 side. When 'Clear communication error count' (SB0006) is turned on, the stored count is cleared.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW0077	PORT1 total number of received data (upper 1 word)	When FFFFFFFFH (maximum value 4294967295) is counted, counting stops.			
SW0078	Transient transmission time (calculation value)	Stores the transient transmission time calculated by the number of slave stations and the number of points that are set in "Network Configuration Settings" under "Basic Settings". (Unit: μ s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW007C	PORT2 cable disconnection detection count	Stores the cumulative count that was detected for cable disconnections at the P2 side. When 'Clear communication error count' (SB0006) is turned on, the stored count is cleared. When FFFFH (maximum value 65535) is counted, the value returns to 0 and the module continues to count.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW007D	PORT2 receive error detection count	Stores the cumulative count that error data was received at the P2 side. The count stores only error data that is not transmitted to all stations. When 'Clear communication error count' (SB0006) is turned on, the stored count is cleared. When FFFFH (maximum value 65535) is counted, counting stops.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW007E	PORT2 total number of received data (lower 1 word)	Stores the cumulative count that data was received at the P2 side. When 'Clear communication error count' (SB0006) is turned on, the stored count is cleared.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW007F	PORT2 total number of received data (upper 1 word)	When FFFFFFFFH (maximum value 4294967295) is counted, counting stops.			
SW00B0 to SW00B7	Data link status of each station	Stores the data link status of each station. 0: Data link normally operating station 1: Data link faulty station • If multiple stations change from faulty to normal, because they are reconnected to the network one by one per cycle, the time until the status changes to "0: Data link normally operating station" may vary by several seconds. • If no response is received for several cycles, the station is determined to be a data link faulty station. Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, "0: Data link normally operating station" is reflected to the remote station. (Conditions) • Stations that surpass the maximum station number are ignored. (Also used in the CLPA conformance test.)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/> * ¹
SW00C0 to SW00C7	Reserved station setting status	Stores the reserved station setting status of each station. 0: Station other than a reserved station 1: Reserved station (Conditions) • Stations that surpass the maximum station number are ignored. (Also used in the CLPA conformance test.)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/> * ¹

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No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SW00C8 to SW00CF	Parameter setting status	Stores the status of parameter settings. 0: No parameter setting 1: Parameter set (Conditions) • Stations that surpass the maximum station number are ignored.	○	×	○*1
SW00D0 to SW00D7	Error invalid station setting status	Stores the error invalid station setting status of each station. 0: Station other than an error invalid station 1: Error invalid station (Conditions) • Stations that surpass the maximum station number are ignored.	○	×	○*1
SW00E8 to SW00EF	Station type match status	Shows the match status of the parameters with the station types. (This is available only for the number of connected modules.) 0: Station type matched 1: Station type mismatch	○	×	○*1
SW00F0 to SW00F7	CPU operating status of each station	Stores the CPU operating status of each station. 0: RUN or PAUSE state 1: STOP state or moderate/major error (Conditions) • Reserved stations and stations that surpass the maximum station number are ignored. • Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, the authentication Class A remote station turns into RUN or PAUSE state.	○	×	○*1
SW0100 to SW0107	CPU moderate/major error status of each station	Stores the moderate/major error occurrence status of each station. 0: No moderate/major error 1: Moderate/major error occurring (Conditions) • If an error occurs, data prior to error is held. • Reserved stations and stations that surpass the maximum station number are ignored. • Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, "0: No moderate/major error" is reflected to the remote station.	○	×	○*1
SW0110 to SW0117	CPU minor error status of each station	Stores the minor error occurrence status of each station. 0: Normal, or a moderate or serious error occurring 1: Minor error occurring (Conditions) • Reserved stations and stations that surpass the maximum station number are ignored. • Since a local station cannot obtain the station information of the authentication Class A remote station when communicating in multicast mode, "0: Normal or moderate/major error occurring" is reflected to the remote station.	○	×	○*1
SW0160 to SW0167	Execution result of slave station parameter automatic setting function	When the slave station parameter automatic setting is completed with an error, the bit of the target station is turned on. On: Completed with an error Off: Completed successfully When the setting is completed with an error, the error code is stored in 'Detailed execution result of slave station parameter automatic setting' (SW0194). When completed with an error caused by the master station, the bit is not turned on.	○	×	×
SW0194	Detailed execution result of slave station parameter automatic setting	When the slave station parameter automatic setting is completed with an error, the error code is stored. When completed with an error caused by the slave station, the bit of the target station of 'Execution result of slave station parameter automatic setting function' (SW0160 to SW0167) is turned on.	○	×	×
SW0198	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 successfully 1 or greater: Completed with an error (Error code is stored.)	○	○	○

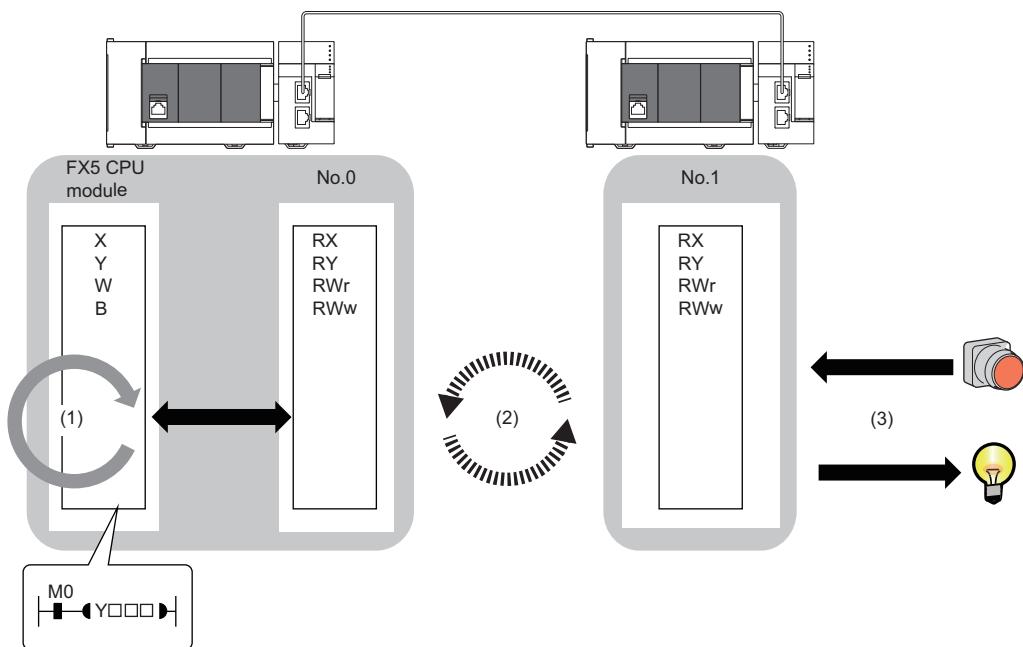
No.	Name	Description	Availability		
			Master station	Local station	
				Unicast mode	Multicast mode
SW0199	Link dedicated instructions processing result CH4	Stores the processing results of the link dedicated instruction that used channel 4 of the own station. 0: Completed successfully 1 or greater: Completed with an error (Error code is stored.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW019A	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 successfully 1 or greater: Completed with an error (Error code is stored.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW019B	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 successfully 1 or greater: Completed with an error (Error code is stored.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW019C	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 successfully 1 or greater: Completed with an error (Error code is stored.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SW019D	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 successfully 1 or greater: Completed with an error (Error code is stored.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*1 This register is enabled when 'Data link status of own station' (SB0049) is off.

Appendix 6 Processing Time

The transmission delay time of CC-Link IE TSN consists of the time components below. (☞ Page 213 Cyclic transmission delay time)

(1) Master station sequence scan time + (2) Communication cycle interval (cyclic data transfer processing time) + (3) Slave station processing time



- Sequence scan time: ☰ MELSEC iQ-R CPU Module User's Manual (Application)
- Communication cycle interval (cyclic data transfer processing time): ☰ Page 215 Communication cycle intervals
- Slave station processing time: ☰ Manual for the slave station used

Cyclic transmission delay time

This section shows how to calculate the following cyclic transmission delay time.

- The time between the transmission source CPU module device turning on or off and the transmission destination CPU module device turning on or off
- The time between data setting in the transmission source CPU module device and the data being stored in the transmission destination CPU module device

Master station ← remote station

When data is transmitted from a remote station (input) to the master station (RX/RWr).

Calculation value	Station-based block data assurance	No station-based block data assurance
Normal value	$(SM \times 1) + (LS \times n1) + Rio$	$(SM \times 1) + (LS \times 1) + Rio$
Maximum value	$(SM \times 1) + (LS \times (n1 + 1)) + Rio$	$(SM \times 1) + (LS \times 2) + Rio$

■Variable

Name of variable	Description	Unit
SM	Master station sequence scan time	μs
LS	Communication cycle interval	μs
Rio	Processing time of the remote station	μs
n1	Round up the calculated value to the nearest integer of $(SM \div LS)$	—

Master station → remote station

When data is transmitted from the master station (RY/RWw) to a remote station (output).

Calculation value	Station-based block data assurance	No station-based block data assurance
Normal value	$(SM \times n2) + (LS \times 1) + Rio$	$(SM \times 1) + (LS \times 1) + Rio$
Maximum value	$(SM \times n2) + (LS \times 2) + Rio$	$(SM \times 2) + (LS \times 2) + Rio$

■Variable

Name of variable	Description	Unit
SM	Master station sequence scan time	μs
LS	Communication cycle interval	μs
Rio	Processing time of the remote station	μs
n2	Round up the calculated value to the nearest integer of $(LS \div SM)$	—

Master station ← local station

When data is transmitted from a local station to the master station as follows:

- Master station (RX) ← local station (RY)
- Master station (RWr) ← local station (RWw)

Calculation value	Station-based block data assurance	No station-based block data assurance
Normal value	If $LS < SL$: $(SM \times 1) + (LS \times (n1 + 1)) + (SL \times 1)$	$(SM \times 1) + (LS \times 2) + (SL \times 1)$
	If $LS \geq SL$: $(SM \times 1) + (LS \times (n1 + 2))$	
Maximum value	$(SM \times 2) + (LS \times (n1 + 2)) + (SL \times 1)$	$(SM \times 2) + (LS \times 3) + (SL \times 1)$

■Variable

Name of variable	Description	Unit
SM	Master station sequence scan time	μs
LS	Communication cycle interval	μs
SL	Local station sequence scan time	μs
n1	Round up the calculated value to the nearest integer of $(SM \div LS)$	—

Master station → local station

When data is transmitted from the master station to a local station as follows:

- Master station (RY) → local station (RX)
- Master station (RWw) → local station (RWr)

Calculation value	Station-based block data assurance	No station-based block data assurance
Normal value	If $LS < SM$: $(SM \times 1) + (LS \times (n3 + 1)) + (SL \times 1)$	$(SM \times 1) + (LS \times 2) + (SL \times 1)$
	If $LS \geq SM$: $(LS \times (n3 + 2)) + (SL \times 1)$	
Maximum value	$(SM \times 1) + (LS \times (n3 + 2)) + (SL \times 2)$	$(SM \times 1) + (LS \times 3) + (SL \times 2)$

■ Variable

Name of variable	Description	Unit
SM	Master station sequence scan time	μs
LS	Communication cycle interval	μs
SL	Local station sequence scan time	μs
n3	Round up the calculated value to the nearest integer of $(SL \div LS)$	—

Communication cycle intervals

The minimum value of the communication cycle interval (cyclic data transfer processing time) is calculated by the following calculation formula. The parts enclosed in double quotation marks (" ") in the table of Variable are the values set for "Network Configuration Settings" under "Basic Settings".

Communication mode	Reference
Unicast mode	Page 216 Unicast mode
Multicast mode	Page 218 Multicast mode



Each calculation value obtained from the calculation formulas mentioned above are stored in the following link special registers (SW).

- SW0072: Communication cycle interval (calculation value) [μs]
- SW0073: Cyclic transmission time (calculation value) [μs]
- SW0078: Transient transmission time (calculation value) [μs]

If each calculation result is larger than the set value of "Basic Period Setting" under "Basic Settings" as follows, an error occurs.

- 3010H: When the communication cycle interval (calculation value) [μs] is larger than the set value of "Communication Period Interval Setting"
- 3011H: When the cyclic transmission time (calculation value) [μs] is larger than the set value of "Cyclic Transmission Time"
- 3013H: When the transient transmission time (calculation value) [μs] is larger than the displayed value of "Transient Transmission Time"

When an error occurs, each calculation value is displayed in "Detailed information" in the [Error Information] tab of module diagnostics. Correct each set value of "Basic Period Setting" referring to the calculation value displayed so that the set value is equal to or larger than the calculation value.

A

Unicast mode

■Calculation formula

Communication cycle interval [ns]= $\alpha_c + \alpha_p$ or 250000, whichever is larger. Round up values of α_c and α_p that are less than 1μs.

- α_c : Cyclic transmission speed [ns] is the largest value in the following calculation formulas.

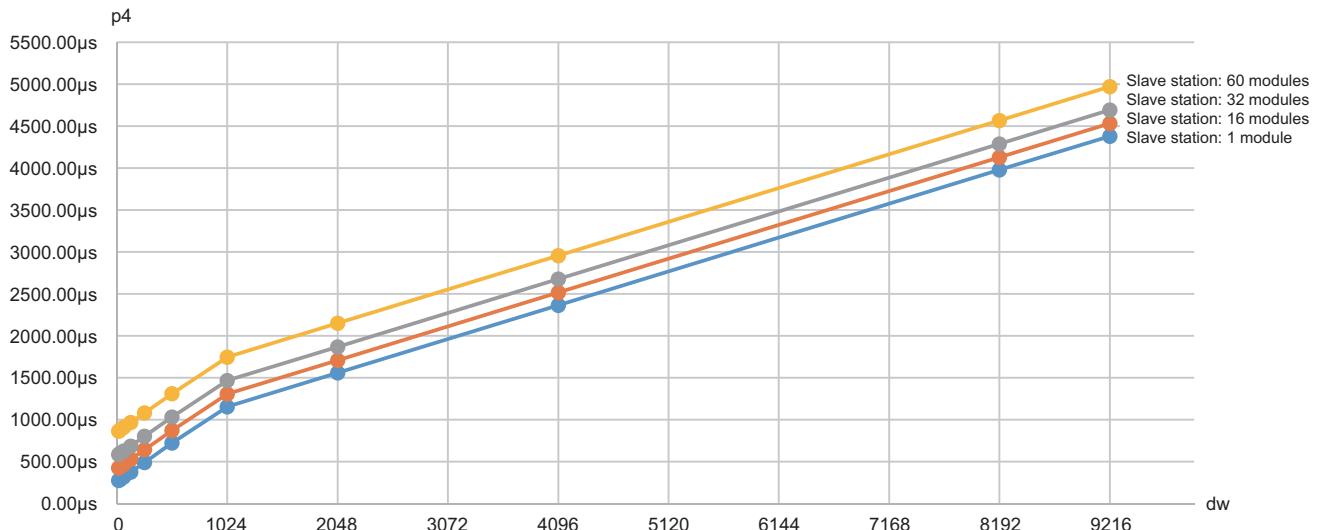
No.	Calculation formula
1	$\{(50 \times n1) + (16 \times n2) + ndm\} \times 8 + (Sn-1) \times 830 + 14000 + nh$
2	$\{(30 \times n1) + (16 \times n2) + ndm\} \times 4 + (1661 \times n1) + (Sn-1) \times 830 + 14300 + nh$
3	$\{(50 \times n3) + (20 \times n4) + nds\} \times 8 + 14000 + nh$
4	$\{(50 \times n5) + (20 \times n6) + ndl\} \times 8 + (Sn-1) \times 830 + 14000 + nh$
5	50000

- α_p : Cyclic processing time [ns] is calculated by p1+p4.

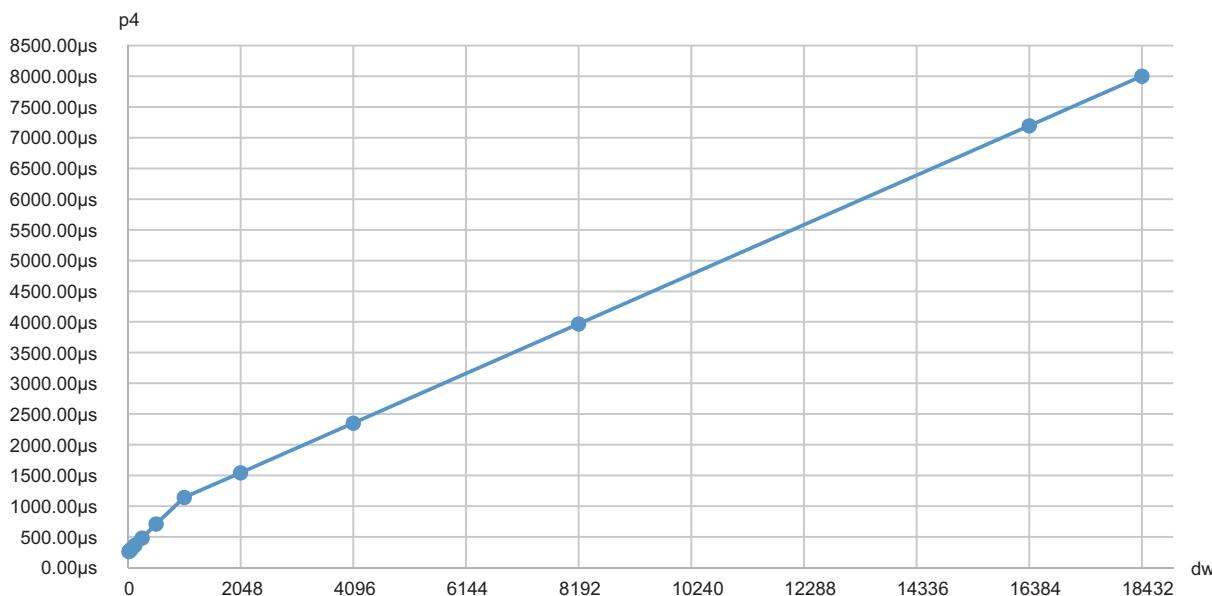
■Variable

Name of variable	Description
n1	$(ndm + (16 \times n2)) / 1488$ or Sn , whichever is larger
n2	$Sn \times (RYb + RWwb)$ RYb: Value of (Total number of points of "RY setting")/(11776 × Sn) rounded up to the nearest integer RWwb: Value of (Total number of points of "RWw setting")/(736 × Sn) rounded up to the nearest integer
ndm	$((Total number of points of "RY setting")/8) + ((Total number of points of "RWw setting") \times 2)$
Sn	Number of slave stations
Ln	Number of local stations
nh	Switching hub delay time × Number of switching hubs connected to the network Switching hub delay time: 50000 ^{*1}
n3	$Sn \times nhs$ nhs: Value of $(nds + (20 \times n4)) / (1488 \times Sn)$ rounded up to the nearest integer
n4	$Sn \times (RXb + RWrb) + Sn$ RXb: Value of (Total number of points of "RX setting")/(11744 × Sn) rounded up to the nearest integer RWrb: Value of (Total number of points of "RWr setting")/(734 × Sn) rounded up to the nearest integer
nds	$((Total number of points of "RX setting")/8) + ((Total number of points of "RWr setting") \times 2) + 8 \times Sn$
n5	$(ndl + 20 \times n6) / 1488$
n6	$(ndl - 8) / 1468 + 1$
ndl	$(RXl/8) + (RWrl \times 2) + 8$ RXl: Number of points of "RX setting" of the slave station ^{*2} to be used as the maximum number of link points RWrl: Number of points of "RWr setting" of the slave station ^{*2} to be used as the maximum number of link points
p1: RX/RY/RWr/RWw processing time	$\{((Total number of points of "RX setting") + (Total number of points of "RY setting"))/8 + ((Total number of points of "RWr setting") + (Total number of points of "RWw setting")) \times 2\} \times 5 + (Sn \times 3300)$ However, if Total number of points of "RY setting" = Total number of points of "RX setting" = Total number of points of "RWr setting" = Total number of points of "RWw setting" = 0, then p1 = 0.
p4: RX/RY/RWr/RWw data transfer time	$((dw \times kX) + kY) \times Mg + kM$ However, if dw is 0, p4 = 0.
dw: Total number of words	$((sRX + sRY) / 16) + sRWrl + sRWw$ [Word]
sRX	Total number of points of "RY setting" ^{*4}
sRY	Total number of points of "RY setting" ^{*4}
sRWrl	Total number of points of "RWr setting" ^{*4}
sRWw	Total number of points of "RWw setting" ^{*4}
kX	dw is less than 1000 [words]: 580 dw is 1000 [words] or more: 254
KY	dw is less than 1000 [words]: 160000 dw is 1000 [words] or more: 477200
Mg	Station-based block data assurance setting Assured: 1 Not assured: 1.55
kM	When used as a master station: $Sn \times 10000$ When used as a local station: 0

- *1 The switching hub delay time changes depending on the switching hub model and settings.
- *2 This is the slave station with the largest calculation value when, for each slave station, ("RX setting"/8) + ("RW_r setting" × 2) is calculated.
- *3 When the FX5-CCLGN-MS is used as a local station, add a value of p4 to the "Communication Period Setting" under "Basic Settings" of the master station.
- *4 When used as a master station: Total number of points to be set for slave stations
When used as a local station (multicast): Total number of points of slave stations set at the master station
When used as a local station (unicast): Total number of points set for the own station (FX5-CCLGN-MS) at the master station
- *5 The relation of dw (Total number of words) and p4 (RX/RY/RW_r/RW_w data transfer time) is as follows. (Station-based block data assurance: When "not assured")
When used as a master station



When used as a local station



A

Multicast mode

■Calculation formula

Communication cycle interval [ns]= $\alpha_c + \alpha_p$ or 250000, whichever is larger. Round up values of α_c and α_p that are less than 1μs.

- α_c : Cyclic transmission speed [ns] is the largest value in the following calculation formulas.

No.	Calculation formula
1	$\{(50 \times (n1r+n1l)) + (16 \times (n2r+n2l)) + (ndmr+ndml)\} \times 8 + (Sn-1) \times 830 + 14000 + nh + (No.3 \text{ or } No.4, \text{ whichever is larger})$
2	$\{(30 \times (n1r+n1l)) + (16 \times (n2r+n2l)) + (ndmr+ndml)\} \times 4 + (1661 \times (n1r+n1l)) + (Sn-1) \times 830 + 14300 + nh + (No.3 \text{ or } No.4, \text{ whichever is larger})$
3	$\{(50 \times n3) + (20 \times n4) + nds\} \times 8 + 14000 + nh$
4	$\{(50 \times n5) + (20 \times n6) + ndl\} \times 8 + (Sn-1) \times 830 + 14000 + nh$
5	50000

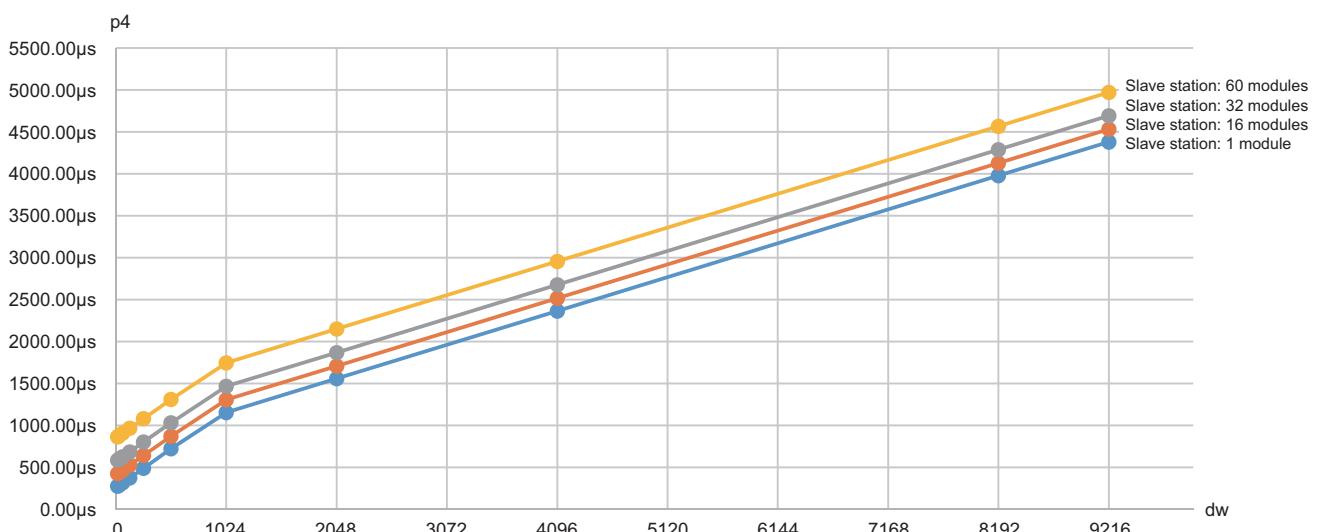
- α_p : Cyclic processing time [ns] is calculated by p1+p4.

■Variable

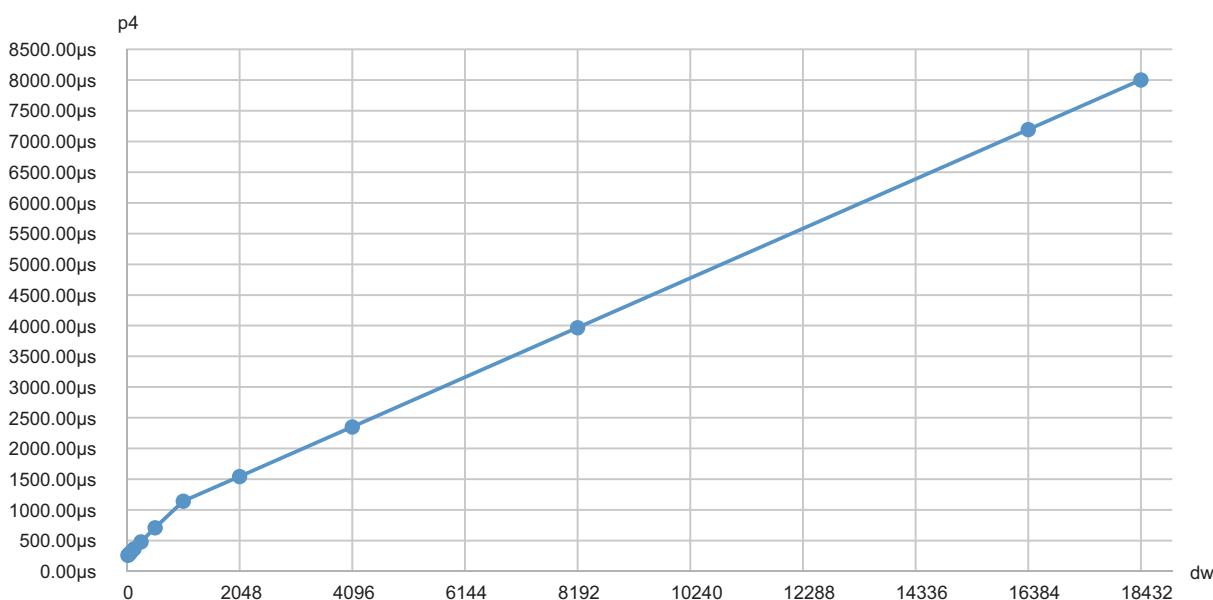
Name of variable	Description
n1r	$(ndmr + (16 \times n2r))/1488$ or Rn , whichever is larger
n1l	Round up the calculated value to the nearest integer of $(ndml + (16 \times n2l))/1488$
n2r	$Rn \times (RYrb + RWrb)$ RYrb: Value of (Total number of points of "RY setting" set in the remote station)/(11776 × Rn) rounded up to the nearest integer RWrb: Value of (Total number of points of "RWw setting" set in the remote station)/(736 × Rn) rounded up to the nearest integer
n2l	$RYlb + RWlb + 1$ RYlb: Value of (Total number of points of "RY setting") ² /11776 rounded up to the nearest integer RWlb: Value of (Total number of points of "RWw setting") ² /736 rounded up to the nearest integer
ndmr	$((Total \text{ number } \text{ of } \text{ points } \text{ of } "RY \text{ setting}")/8) + ((Total \text{ number } \text{ of } \text{ points } \text{ of } "RWw \text{ setting}") \times 2)$
ndml	$((Total \text{ number } \text{ of } \text{ points } \text{ of } "RY \text{ setting}")/8) + ((Total \text{ number } \text{ of } \text{ points } \text{ of } "RWw \text{ setting}") \times 2) + +24$
Sn	Number of slave stations
Rn	Number of remote stations
Ln	Number of local stations
nh	Switching hub delay time × Number of switching hubs connected to the network Switching hub delay time: 50000 ¹
n3	$Sn \times nhs$ nhs: Value of $(nds + (20 \times n4))/(1488 \times Sn)$ rounded up to the nearest integer
n4	$Sn \times (RXb + RWrb) + Sn$ RXb: Value of (Total number of points of "RX setting")/(11744 × Sn) rounded up to the nearest integer RWrb: Value of (Total number of points of "RWr setting")/(734 × Sn) rounded up to the nearest integer
nds	$((Total \text{ number } \text{ of } \text{ points } \text{ of } "RX \text{ setting}")/8) + ((Total \text{ number } \text{ of } \text{ points } \text{ of } "RWr \text{ setting}") \times 2) + 8 \times Sn$
n5	$(ndl + 20 \times n6)/1488$
n6	$(ndl - 8)/1468 + 1$
ndl	$(RXl/8) + (RWrl \times 2) + 8$ RXl: Number of points of "RX setting" of the slave station ³ to be used as the maximum number of link points RWrl: Number of points of "RWr setting" of the slave station ³ to be used as the maximum number of link points
p1: RX/RY/RWr/RWw processing time	$\{((Total \text{ number } \text{ of } \text{ points } \text{ of } "RX \text{ setting}") + (Total \text{ number } \text{ of } \text{ points } \text{ of } "RY \text{ setting}")/8 + ((Total \text{ number } \text{ of } \text{ points } \text{ of } "RWr \text{ setting}") + (Total \text{ number } \text{ of } \text{ points } \text{ of } "RWw \text{ setting}") \times 2) \times 5 + (Sn \times 3300)$ However, if Total number of points of "RY setting" = Total number of points of "RX setting" = Total number of points of "RWr setting" = Total number of points of "RWw setting" = 0, then p1 = 0.
p4: RX/RY/RWr/RWw data transfer time ^{4,6}	$((dw \times kX) + kY) \times Mg + kM$ However, if dw is 0, p4 = 0.
dw: Total number of words	$((sRX + sRY)/16) + sRWr + sRWw$ [Word]
sRX	Total number of points of "RY setting" ⁵
sRY	Total number of points of "RY setting" ⁵
sRWr	Total number of points of "RWr setting" ⁵
sRWw	Total number of points of "RWw setting" ⁵
kX	dw is less than 1000 [words]: 580 dw is 1000 [words] or more: 254
KY	dw is less than 1000 [words]: 160000 dw is 1000 [words] or more: 477200

Name of variable	Description
Mg	Station-based block data assurance setting Assured: 1 Not assured: 1.55
KM	When used as a master station: $Sn \times 10000$ When used as a local station: 0

- *1 The switching hub delay time changes depending on the switching hub model and settings.
- *2 A sum of values starting from the smallest value set in "Start" to the largest value set in "End" of "Network Configuration Settings".
- *3 This is the slave station with the largest calculation value when, for each slave station, ("RX setting"/8) + ("RW_r setting" × 2) is calculated.
- *4 When the FX5-CCLGN-MS is used as a local station, add a value of p4 to the "Communication Period Setting" under "Basic Settings" of the master station.
- *5 When used as a master station: Total number of points to be set for slave stations
When used as a local station (multicast): Total number of points of slave stations set at the master station
When used as a local station (unicast): Total number of points set for the own station (FX5-CCLGN-MS) at the master station
- *6 The relation of dw (Total number of words) and p4 (RX/RY/RW_r/RW_w data transfer time) is as follows. (Station-based block data assurance: When "not assured")
When used as a master station



When used as a local station



Appendix 7 Port Number

A port number for the system cannot be specified.

Port number		Applications
Decimal	Hexadecimal	
20 to 21	14H to 15H	For system
161 to 162	A1H to A2H	For system
5000	1388H	For system
5001	1389H	MELSOFT transmission port (UDP/IP)
5002 to 5009	138AH to 1391H	For system
5010	1392H	SLMP transmission port (UDP/IP)
5011	1393H	SLMP transmission port (TCP/IP)
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REVISIONS

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company. However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
 2. Failure caused by unapproved modifications, etc., to the product by the user.
 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
 5. Relay failure or output contact failure caused by usage beyond the specified life of contact (cycles).
 6. Failure caused by external irresistible forces such as fires or abnormal voltages, and failure caused by force majeure such as earthquakes, lightning, wind and water damage.
 7. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
 8. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

- (1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

- (1) In using the Mitsubishi MELSEC programmable controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
- (2) The Mitsubishi programmable controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for railway companies or public service purposes shall be excluded from the programmable controller applications.

In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable controller range of applications.

However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the user's discretion.

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HEAD OFFICE: TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

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