

Programmable Controller

MELSEC iQ-F
series

MELSEC iQ-F
FX5-EIP EtherNet/IP Module
User's Manual

-FX5-EIP

SAFETY PRECAUTIONS

(Read these precautions before use.)

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

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

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

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

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

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

[DESIGN PRECAUTIONS]

WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
 - Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.
 - 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, transistor or triac 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 current rating 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. Improper operation may damage machines or cause accidents.
- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

[DESIGN PRECAUTIONS]

WARNING

- Do not write any data to the "system area" and "write-protect area" of the buffer memory in the intelligent function module. Doing so may cause malfunction of the programmable controller system. For the "system area" or "write-protect area", refer to  Page 225 Buffer Memory.
 - If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail. Incorrect output or malfunction due to a communication failure may result in an accident.
 - For the operating status of each EtherNet/IP device after a communication failure, refer to  Page 178 TROUBLESHOOTING in this manual. Incorrect output or malfunction due to a communication failure may result in an accident.
 - Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail in multiple EtherNet/IP devices. Failure to do so may result in an accident due to an incorrect output or malfunction.
-

[DESIGN PRECAUTIONS]

CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
 - When an inductive load such as a lamp, heater, or solenoid valve is controlled, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Take proper measures so that the flowing current dose not exceed the value corresponding to the maximum load specification of the resistance load.
 - Do not power off the CPU module or reset the CPU module while the settings are being written. Doing so will make the data in the flash ROM undefined. The values need to be set in the buffer memory and written to the flash ROM again. Doing so also may cause malfunction or failure of the module.
-

[SECURITY PRECAUTIONS]

WARNING

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

[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 malfunction or failure.
 - 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 cables, input/output cables and battery connecting cable securely to the specified 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 equipment failures or malfunctions.
 - Peripherals, 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 properly wire to the spring clamp terminal block in accordance with the following precautions. Failure to do so may cause electric shock, equipment failures, a shortcircuit, wire breakage, malfunctions, or damage to the product.
 - The disposal size of the cable end should follow the dimensions described in the manual.
 - Twist the ends of stranded wires and make sure that there are no loose wires.
 - Do not solder-plate the electric wire ends.
 - Do not connect more than the specified number of wires or electric wires of unspecified size.
 - Affix the electric wires so that neither the terminal block nor the connected parts are directly stressed.
-

[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) of the CPU module used).
 - Individually ground the FG terminal of the programmable controller with a ground resistance of 100Ω or less. Failure to do so may result in electric shock or malfunction.
 - Install module so that excessive force will not be applied to terminal blocks, or communication cables. Failure to do so may result in wire damage/breakage or programmable controller failure.
 - Make sure to observe the following precautions 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 control line and communication cables together with or lay them close to the main circuit, high-voltage line, load line or power line. Keep a distance of 100mm or more between them.
 - Ground the shield of the shielded wire or shielded 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 described in  Page 88 Wiring Products. If not, normal data transmission is not guaranteed.
-

[STARTUP AND MAINTENANCE PRECAUTIONS]

WARNING

- Do not touch any terminal while the power of the programmable controller 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 may result in 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. Improper operation may damage machines or cause accidents.
 - Do not change the program in the programmable controller from two or more peripherals (such as engineering tools or GOTs) at the same time. Doing so may cause destruction or malfunction of the programmable controller program.
-

[STARTUP AND MAINTENANCE PRECAUTIONS]

CAUTION

- When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
 - Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
 - Do not disassemble or modify the programmable controller. Doing so may cause fire, equipment failures, or malfunctions.
For repair, contact your local Mitsubishi Electric representative.
 - Turn off the power to the programmable controller before attaching or detaching the following devices. Failure to do so may cause equipment failures or malfunctions.
 - Peripherals, expansion board, expansion adapter, and connector conversion adapter
 - Extension modules, bus conversion module, and connector conversion module
 - Battery
 - Read relevant manuals carefully and ensure the safety before performing online operations (operation status change) with peripheral devices connected to the CPU modules of other stations. Improper operation may damage machines or cause accidents.
-

[OPERATION 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. Improper operation may damage machines or cause accidents.
 - Do not power off the CPU module or reset the CPU module while the setting values in the buffer memory are being written to the flash ROM in the intelligent function module. Doing so will make the data in the flash ROM undefined. The values need to be set in the buffer memory and written to the flash ROM again. Doing so can cause malfunction or failure of the module.
 - Note that the whole system may not be reset by the RUN/STOP/RESET switch when the CPU module or intelligent function module detects an error, such as a watchdog timer error, during self-diagnosis. In such cases, turn the power off and on again.
-

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of this product, treat it as industrial waste.
-

[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 by using dedicated packaging boxes and shock-absorbing pallettes. Failure to do so may cause failures in the programmable controller. After transportation, verify the operation of the programmable controller and check for any damage to the parts, such as the mounting part.
-

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 EtherNet/IP module of MELSEC iQ-F series.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the specifications to handle the product correctly.

Please make sure that the end users read this manual.

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, or other documents are used as a reference, please use them after confirming the function and safety of the equipment and system. Mitsubishi Electric will not accept responsibility for actual use of the product based on these illustrative examples.
- The contents of this manual, including specifications, are subject to change without notice for improvement.
- The information in this manual has been carefully checked and is believed to be accurate; however, if any doubtful points, errors, or other issues are found, please contact the nearest 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 FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware) <SH-082452ENG>	Hardware, including performance specifications, wiring, installation, and maintenance of the CPU module
MELSEC iQ-F FX5 User's Manual (Application) <JY997D55401>	Basic knowledge required for program design, functions, devices/labels, and parameters of the CPU module
MELSEC iQ-F FX5 Programming Manual (Program Design) <JY997D55701>	Program specifications of ladder, ST, FBD/LD, and SFC, 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 a program
MELSEC iQ-F FX5 User's Manual (Communication) <SH-082625ENG>	Communication functions of the built-in CPU module and the Ethernet module
MELSEC iQ-F FX5 EtherNet/IP Module User's Manual <SH-082709ENG> (this manual)	Description of FX5-EIP
GX Works3 Operating Manual <SH-081215ENG>	System configuration, parameter settings, and online operations of GX Works3

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Adapter	A station type of EtherNet/IP that corresponds to the device station.
Client	An EtherNet/IP device that transmits commands to the external device
Engineering tool	The product name of the software package for the MELSEC programmable controllers
EtherNet/IP	An industrial Ethernet protocol offered by ODVA
Originator	An EtherNet/IP device that transmits a connection establishment request of EtherNet/IP
Scanner	The EtherNet/IP station type that corresponds to the master station
Server	An EtherNet/IP device that returns responses to the commands from the external device
Target	An EtherNet/IP device that receives a connection establishment request from the originator

GENERIC TERMS AND ABBREVIATIONS

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

Generic term/abbreviation	Description
CIP	An abbreviation for Common Industrial Protocol. One of the open protocols of ODVA, a specialized application protocol for EtherNet/IP, DeviceNet and ControlNet.
EtherNet/IP device	A generic term for the devices, personal computers, and other equipment connected by EtherNet/IP for data communication
Extension module	A generic term for the FX5 extension modules, FX3 extension modules, and extension modules (extension cable type and extension connector type)
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
FX5UJ CPU module	A generic term for the FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, FX5UJ-60MT/ESS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, and FX5UJ-60MT/DSS
GX Works3	The product name of the software package, SWnDND-GXW3, for the MELSEC programmable controllers (The 'n' represents a version.)
Intelligent function module	A generic term for the FX5 intelligent function modules
Peripherals	A generic term for the engineering tools and GOTs
PPS	An abbreviation for Packets Per Second. It indicates the number of packets that can be processed in one second.
RPI	An abbreviation for Requested Packet Interval. It is the communication cycle determined by the originator during communications between EtherNet/IP devices.
TCP	An abbreviation for Transmission Control Protocol. In communications among programmable controllers and networked devices, this protocol establishes a connection between port numbers of the two devices to perform reliable data communications.
UDP	An abbreviation for User Datagram Protocol. This protocol is a connectionless protocol and thereby its speed is faster than that of TCP, but less reliable. (Data may be lost or not be received in correct order.)

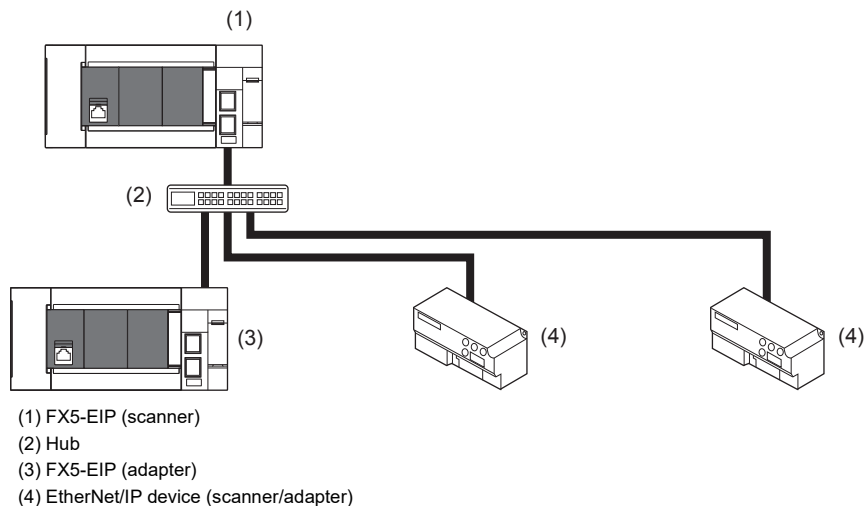
1 OUTLINE

The FX5-EIP EtherNet/IP module (hereafter referred to as FX5-EIP) is an intelligent function module for connecting to an EtherNet/IP network and standard Ethernet.

EtherNet/IP communication

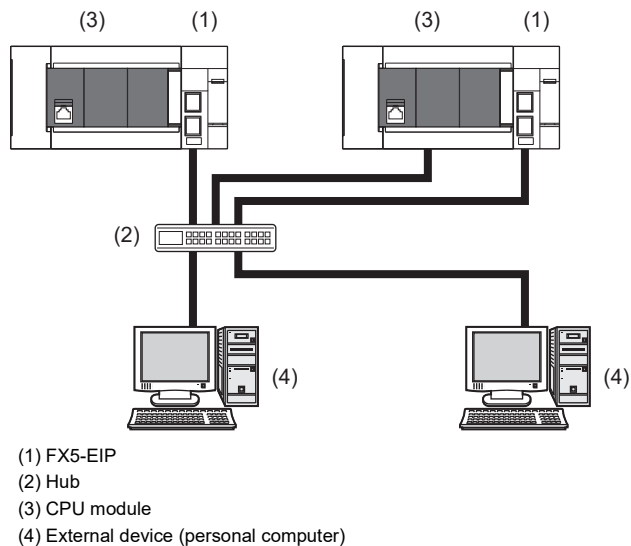
The module can communicate seamlessly with an EtherNet/IP network by using the communication protocol CIP.

The FX5-EIP functions as a scanner (originator/client) or an adapter (target/server) of the EtherNet/IP network.



Standard Ethernet communication

The module can be connected with a host system, such as a personal computer, by using the communication protocol TCP/UDP.



2 SPECIFICATIONS

This chapter describes the FX5-EIP specifications.

2.1 General Specifications

The items other than the following are equivalent to those of the CPU module.

For the general specifications, refer to the following manual.

 MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

Item	Specifications	
Withstand voltage	500VAC for 1 minute	Between all terminals and ground terminal
Insulation resistance	10M Ω or higher by 500VDC insulation resistance tester	

2.2 Power Supply Specifications

The following table lists the power supply specifications.

Item		Specifications
Internal power supply	Power supply voltage	24VDC
	Current consumption	110mA

2.3 Performance Specifications

The following table lists the performance specifications.

Item			Description
EtherNet/IP communications ^{*1}	Class1 communications	Communication format	<ul style="list-style-type: none"> • Instance communications • Tag communications
		Number of connections ^{*2}	<ul style="list-style-type: none"> • 64 connections • 128 connections
		Communication data size ^{*2}	<ul style="list-style-type: none"> • 64 connections: 1444 bytes (per connection)^{*3} • 128 connections: 600 bytes (per connection)^{*3}
		Connection type	Point-to-point, multicast
		RPI (communication cycle)	2 to 60000ms
		PPS (communication processing performance)	7000pps (at 10 bytes) 5000pps (at 600 bytes) 2000pps (at 1444 bytes)
	Class3 communications	Communication format	<ul style="list-style-type: none"> • Instance communications • Tag communications
		Number of connections ^{*2}	<ul style="list-style-type: none"> • Server: 32 connections (number of simultaneous executions) • Client: 64 connections, 128 connections
		Communication data size ^{*2}	■64 connections Instance communications: 1404 bytes (per connection) Tag communications: 496 bytes (per connection) ■128 connections Instance communications: 600 bytes (per connection) Tag communications: 496 bytes (per connection)
		Connection type	Point-to-point
	UCMM communications	Communication format	<ul style="list-style-type: none"> • Instance communications • Tag communications
		Number of connections (number of simultaneous executions)	<ul style="list-style-type: none"> • Server: 32 connections • Client: 32 connections
		Communication data size	<ul style="list-style-type: none"> • Instance communications: 504 bytes (including headers) • Tag communications: 498 bytes
		Connection type	Point-to-point
	Transmission specifications	Data transmission speed	100Mbps
		Communication mode	Full-duplex
		Transmission method	Base band
		Interface	RJ45 connector
		IP version	IPv4 is supported.
		Maximum segment length	100m (length between hub and node) ^{*4}
		Number of cascade connections	100BASE-TX 2 levels maximum ^{*5}
	Network topology		Line topology, star topology (The mixture of line topology and star topology is also possible.)
	Hub ^{*6}		Hubs with 100BASE-TX ports ^{*7} can be used.
	Connection cable ^{*8}	100BASE-TX	Ethernet cable of category 5 or higher (STP cable)

Item				Description	
Standard Ethernet communication	Transmission specifications	Data transmission speed		100/10Mbps	
		Communication mode		Full-duplex or half-duplex ^{*6}	
		Transmission method		Base band	
		Interface		RJ45 connector	
		Maximum segment length		100m (length between hub and node) ^{*4}	
		Number of cascade connections	100BASE-TX	2 levels maximum ^{*5}	
	10BASE-T		4 levels maximum ^{*5}		
	Protocol type			MELSOFT connection, SLMP client (3E frame), SLMP server (3E/1E frame), socket communication	
	Number of connections			Total of 32 connections ^{*9} (Up to 32 external devices can access one FX5-EIP module at the same time.)	
	Hub ^{*6}			Hubs with 100BASE-TX or 10BASE-T ports ^{*10} can be used.	
Connection cable ^{*8}	100BASE-TX	Ethernet cable of category 5 or higher (STP cable)			
	10BASE-T	Ethernet cable of category 3 or higher (STP/UTP cable)			
Number of ports				2 ^{*11}	
Number of occupied I/O points				8 points	
Applicable CPU module				For versions corresponding to the CPU modules or controller, refer to the user's manual for the CPU module or controller used.	
Applicable engineering tool		GX Works3			
Number of connectable modules				1 module	

*1 EtherNet/IP communication specifications are available only within the specifications of the communication destination.

*2 This size is the maximum size which can be specified to 'Data length' of Class1 communication input data area of the request command during the client operation.

During the server operation, since the FX5-EIP automatically responds according to the request command received from the client, the maximum size is not prescribed.

*3 If the communication destination device does not support Large_Forward_Open (CIP option specification), the maximum communication data size is 504 bytes.

*4 For maximum segment length (length between hubs), contact the manufacturer of the hub used.

*5 This number applies when a repeater hub is used. When using a switching hub, check the number of cascaded stages with the manufacturer of the hub to be used.

*6 IEEE 802.3x flow control is not supported.

*7 The ports must comply with the IEEE 802.3 100BASE-TX standards.

*8 A straight/cross cable can be used.

*9 The first device for MELSOFT connection is not included in the number of connections. (The second and the following devices are included.)

The EtherNet/IP communication is not included in the number of connections.

*10 The ports must comply with the IEEE 802.3 100BASE-TX or IEEE 802.3 10BASE-T standards.

*11 Since the IP address is shared by two ports, only one address can be set.

Point

For the FX5-EIP, the maximum number of connections can be switched to 64 or 128 connections. (The communication data size also changes depending on the maximum number of connections.)

For information on changing the maximum number of connections, refer to the following.

☞ Page 91 Maximum Number of Connections Setting

Combinations of number of connections

The following table shows which combination is counted for the total number of connections for each communication.

○: Count, ×: Do not count

Item			Number of connections that can be set ^{*1}	Number of client simultaneous executions ^{*2}	Number of server simultaneous executions ^{*3}	Number of consumed connections ^{*4}
Class1 communications	Instance communications	Client	○	×	×	○
		Server	○	×	×	○
	Tag communications	Client	○	×	×	○
		Server	○	×	×	○
Class3 communications	Instance communications	Client	○	×	×	○
		Server	×	×	○	○
	Tag communications	Client	○	×	×	○
		Server	○	×	○	○
UCMM communications ^{*5}	Instance communications	Client	○	○	×	×
		Server	×	×	○	×
	Tag communications	Client	○	○	×	×
		Server	○	×	○	×
Total	When the maximum number of connections is 64		64 connections	32 connections	32 connections	128 connections
	When the maximum number of connections is 128		128 connections			

*1 Communication that uses the buffer memory area for one connection.

For Class1 and Class3 communications, the settings made in the "EtherNet/IP Configuration" are stored in the buffer memory. The UCMM communication client is set directly to the buffer memory by the user.

*2 The number of requests that can be transmitted simultaneously. The requests in UCMM communications from transmission until the response is received are counted.

If requests that exceed the upper limit are transmitted, 0165H error will occur.

*3 The number of requests that can be received at a time. If requests that exceed the upper limit are received, they will be ignored.

*4 For details, refer to  Page 253 Number of consumed connections.

*5 Each UCMM communication server setting and active UCMM communication client is counted as one connection. However, no connection is actually established for communication.

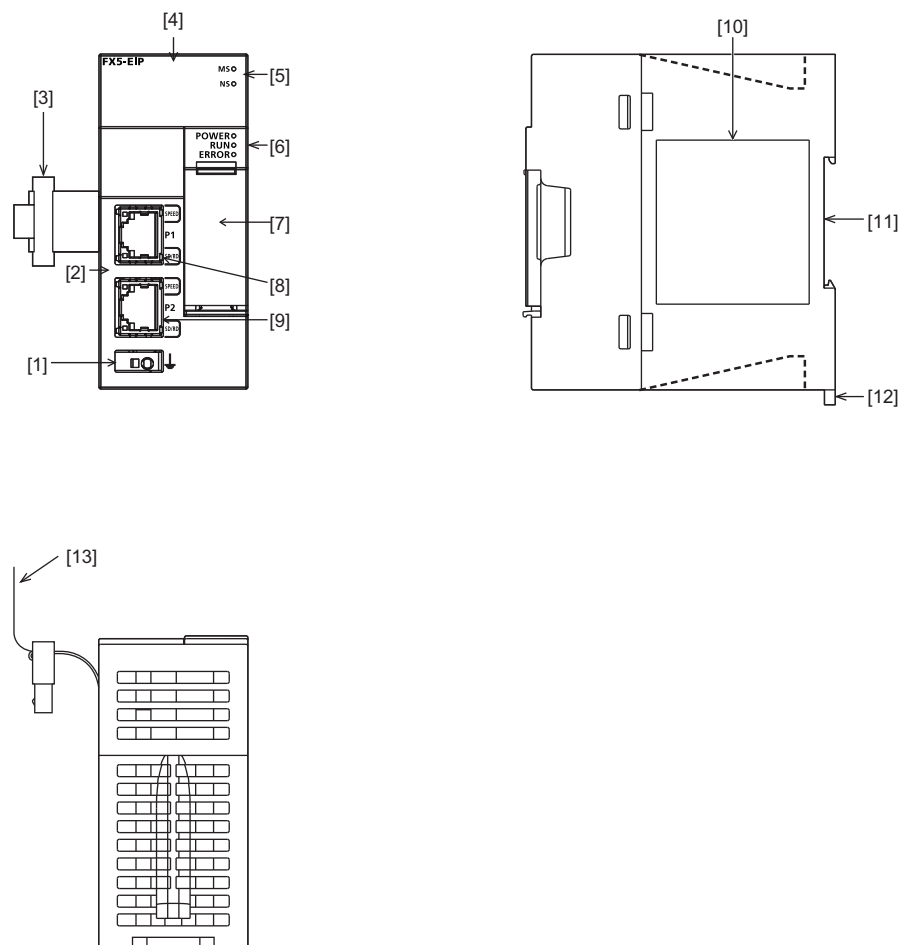
Precautions

The operation of the following connections is not guaranteed. Check the operation before using the module.

- Connection using Internet (general public line) (Internet-access service offered by an Internet service provider or a telecommunications carrier)
- Connection using firewall device(s)
- Connection using broadband router(s)
- Connection using wireless LAN

2.4 Part Names

This section describes the names of each part of the FX5-EIP.



No.	Name	Description
[1]	Grounding terminal block	Connect a ground. (Spring clamp terminal block)
[2]	Link status display LEDs	Displays the link status of module. (☞ Page 21 LED display)
[3]	Extension cable	Cable for connecting the module when adding the modules
[4]	Direct mounting hole	Screw holes (2-φ4.5, mounting screw: M4 screw) for direct installation
[5]	Module/network status display LEDs	Displays the modules and network status. (☞ Page 21 LED display)
[6]	Operation status display LEDs	Refer to ☞ Page 21 LED display.
[7]	Extension connector (for next module)	Connector for connecting the extension cable of an extension module.
[8]	Modular jack for P1 (RJ-45) (with cap)	Port 1 connector for EtherNet/IP network and standard Ethernet network. Connect an Ethernet cable.
[9]	Modular jack for P2 (RJ-45) (with cap)	Port 2 connector for EtherNet/IP network and standard Ethernet network. Connect an Ethernet cable.
[10]	Name plate	The information such as the product model name and product number are shown.
[11]	DIN rail mounting groove	The module can be installed on DIN46277 rail (35mm wide).
[12]	DIN rail mounting hook	Hook for mounting the module on a DIN rail of DIN46277 (35mm wide).
[13]	Pullout tab	Used when drawing out an extension cable.

LED display

The following table lists the LED display.

LED display		LED color	Description
MS		Green, red	Indicates the error status of the EtherNet/IP device. ■ LED color: Green • On: Data communication possible • Flashing: No parameter setting ■ LED color: Red • On: Moderate error or major error • Flashing: Minor error
NS		Green, red	Indicates the EtherNet/IP network status. ■ LED color: Green • On: Data communications being performed*1 • Flashing: Failed to establish connection ■ LED color: Red • On: IP address duplication detected • Flashing: Connection time out
POWER		Green	Indicates the power supply status. • On: Power on • Off: Power off or module failure
RUN		Green	Indicates the operating status. • On: Normal operation • Off: Error
ERROR		Red	Indicates the module error status. • On: Minor error or major error • Flashing: Moderate error or major error • Off: Normal operation
P1, P2	SPEED	Green	Indicates the transmission speeds of P1 and P2. • On: Link-up (100Mbps) • Off: Link-up (10Mbps)
	SD/RD	Green	Indicates the data transmitting/receiving status of P1 and P2. • On, Flashing: Data being transmitted or received • Off: Data not transmitted or received

*1 UCMM communications do not establish any connection. Therefore, the LED does not turn on in green when only UCMM communications are performed.

3 PROCEDURES BEFORE OPERATION

This chapter describes the procedures before operation.

EtherNet/IP communication

1. Checking the specifications of the FX5-EIP

Check the specifications of the FX5-EIP. ( Page 16 SPECIFICATIONS)

2. Installation of the FX5-EIP

Connect the FX5-EIP to the CPU module. For details, refer to the following.

 MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

3. Configuring a network

Configure a network and set parameters which are required for start-up.

- Wiring ( Page 85 WIRING)
- Setting parameters ( Page 89 PARAMETER SETTINGS)

4. Programming

Create a program. ( Page 124 PROGRAMMING)

5. Checking the communication status

Check the communication status of the FX5-EIP. ( Page 180 Checking the Module Status)

Standard Ethernet communication

1. Checking the specifications of the FX5-EIP

Check the specifications of the FX5-EIP. ( Page 16 SPECIFICATIONS)

2. Installation of the FX5-EIP

Connect the FX5-EIP to the CPU module. For details, refer to the following.

 MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

3. Configuring a network

Configure a network and set parameters which are required for start-up.

- Wiring ( Page 85 WIRING)
- Setting parameters ( Page 89 PARAMETER SETTINGS)

For further steps, refer to the following manual for each function.

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

4 FUNCTION

This chapter describes the functions available for the FX5-EIP.

4.1 Function List

EtherNet/IP communication functions

This section describes data communication between the FX5-EIP and EtherNet/IP devices.



For the FX5-EIP, the maximum number of connections can be switched to 64 or 128 connections. (Some buffer memory addresses also change depending on the maximum number of connections.)

For information on changing the maximum number of connections, refer to the following.

☞ Page 91 Maximum Number of Connections Setting

This chapter describes buffer memory addresses for the 64-connection setting. When checking buffer memory addresses for the 128-connection setting, refer to the following.

☞ Page 225 List of buffer memory addresses

Function	Description	Reference
Cyclic communication function	<p>This function establishes a connection and periodically performs data communications with EtherNet/IP devices.</p> <p>■Class1 instance communications Periodically performs data communications with EtherNet/IP devices using an instance ID (number) for the connection. This function is used for periodically communicating with an adapter or scanner.</p> <p>■Class1 tag communications Using a tag name (character string) for the connection, data communications are periodically performed with EtherNet/IP devices. This function is used for periodically communicating with an adapter or scanner.</p> <p>■Cyclic communication stop and restart Stop or restart of cyclic communication is enabled individually for each connection with 'Cyclic communication pause specification' (Un\G1360 onwards).</p>	☞ Page 26 Cyclic Communication Function
Message communication function (client)	<p>This function performs message communications through point-to-point between the client (message transmitting side) and the server (message receiving and processing side).</p> <p>■Class1 instance communications Establishes a connection between the FX5-EIP and the EtherNet/IP device (server) to perform message communication.</p> <p>■UCMM instance communications Performs message communication without establishing a connection between the FX5-EIP and the EtherNet/IP device (server).</p> <p>■Class3 tag communications Establishes a connection between the FX5-EIP and the EtherNet/IP device (server), and uses message communication to read and write data to tags.</p> <p>■UCMM tag communications Uses message communication to read and write data to tags without establishing a connection between the FX5-EIP and the EtherNet/IP device (server).</p>	☞ Page 57 Message Communication Function (Client)
Message communication function (server)	<p>This function executes the service specified by a command request transmitted by the client and returns a response.</p> <p>■Class3 instance communications Establishes a connection between the FX5-EIP and the EtherNet/IP device (client), processes command requests received from the client, and transmits response data.</p> <p>■UCMM instance communications Processes command requests received from the client and transmits response data without establishing a connection between the FX5-EIP and the EtherNet/IP device (client).</p> <p>■Class3 tag communications Establishes a connection between the FX5-EIP and the EtherNet/IP device (client) to read and write data to the set tags.</p> <p>■UCMM tag communications Reads and writes data to the set tags without establishing a connection between the FX5-EIP and the EtherNet/IP device (client).</p>	☞ Page 73 Message Communication Function (Server)

Function	Description	Reference
Communication status setting function at the occurrence of a CPU stop error	Sets whether to stop or continue EtherNet/IP communications when RUN state is changed to STOP state or a stop error occurs in a CPU module on which the FX5-EIP is mounted.	☞ Page 78 Communication Status Setting Function at the Occurrence of a CPU Stop Error
EtherNet/IP communication automatic start function	To use this function, EtherNet/IP communication can start without using a program when the programmable controller is powered off and on.	☞ Page 79 EtherNet/IP Communication Automatic Start Function

Standard Ethernet communication functions

For details on standard Ethernet communication functions, refer to the following.

Function	Description	Reference
Direct connection with MELSOFT	The FX5-EIP and an engineering tool (GX Works3) are connected by a single Ethernet cable without using a hub. Communication is performed by simply specifying the connection destination; setting the IP address is not required.	📖 MELSEC iQ-F FX5 User's Manual (Communication)
MELSOFT connection	Communicates with MELSOFT products (such as GX Works3) over a LAN, such as an internal LAN.	📖 MELSEC iQ-F FX5 User's Manual (Communication)
Connected module search function	Searches for the FX5-EIP connected to the same hub as the personal computer using GX Works3. The IP address is acquired by selecting from search results list.	📖 MELSEC iQ-F FX5 User's Manual (Communication)
MELSOFT diagnosis function	Diagnoses the Ethernet ports of a CPU module and the FX5-EIP from GX Works3. (Ethernet diagnostics)	📖 MELSEC iQ-F FX5 User's Manual (Communication)
SLMP communication function	Reads and writes data from external device.	📖 MELSEC iQ-F FX5 User's Manual (Communication)
Socket communication function	By using socket communication instructions, any data can be transferred from and to the external devices connected through Ethernet using TCP or UDP.	📖 MELSEC iQ-F FX5 User's Manual (Communication)
IP filter function	Identifies the IP address of the access source to limit access to the FX5-EIP.	📖 MELSEC iQ-F FX5 User's Manual (Communication)
IP address change function	Changes the IP address of the FX5-EIP by operating a peripheral without using GX Works3.	📖 MELSEC iQ-F FX5 User's Manual (Communication)

Others

Function	Description	Reference
Automatic detection of EtherNet/IP devices	Detects EtherNet/IP devices on the same network connected to the FX5-EIP and automatically adds them to the list of EtherNet/IP configuration devices.	☞ Page 108 Automatic detection of EtherNet/IP devices
Hardware test	Performs hardware tests (RAM and ROM) of the FX5-EIP.	☞ Page 186 Hardware Test
Ethernet diagnostics	Diagnoses the Ethernet port from GX Works3.	📖 MELSEC iQ-F FX5 User's Manual (Communication)
Event history function	Collects errors from the FX5-EIP, and stores them as event information in the CPU module.	☞ Page 182 Event history function
Firmware update function	Updates the firmware version of the FX5-EIP.	📖 MELSEC iQ-F FX5 User's Manual (Application)
Auto refresh processing	Refreshes (transfers) data between the I/O area of the buffer memory data area and the devices in the CPU module.	☞ Page 235 Auto refresh processing
Assurance of input/output data	Assures the input data acquired from EtherNet/IP devices and the output data to be transmitted to EtherNet/IP devices for each connection.	☞ Page 235 Assurance of input/output data

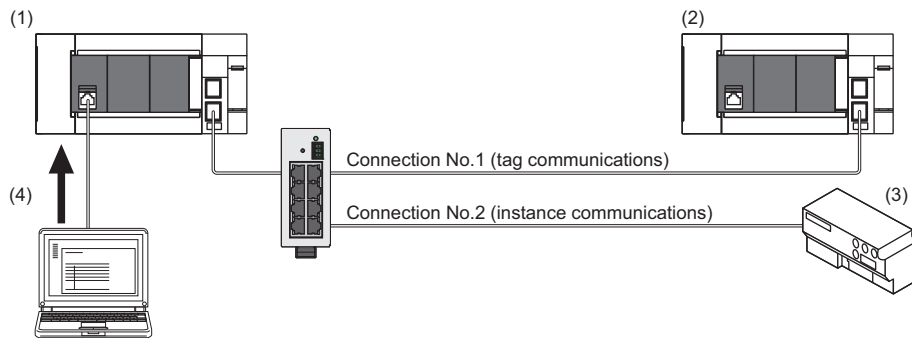
4.2 Cyclic Communication Function

This function establishes a connection and periodically performs data communications between the FX5-EIP and the EtherNet/IP device.

Function overview

In cyclic communication, one device opens a logical communication line called a "connection" to the destination device and performs data communication.

In addition, the originator can open multiple connections for the same target.



- (1) Originator (scanner)
- (2) Target A (scanner)
- (3) Target B (adapter)
- (4) Connection settings for connections number 1 and number 2 are configured in "EtherNet/IP Configuration".

Connection settings

Connection settings are settings for the originator to perform data communications with the target.

A connection to be opened is managed with a connection number (unique value for the own module to manage communications) and the connection settings corresponding to that number.

For connection settings, the following items can be set individually for each connection.

Item*1	Description
IP Address	Set the IP address to identify the external device.
Data Size	Set the data size for communications.
Requested Packet Interval (RPI)	Set the interval between data transmissions.
Timeout Multiplier	Set the time until a connection timeout occurs.*2*3*4
Connection type (input mode/output mode)	Set the data transmission method between the originator and the target. (☞ Page 27 Connection type)
Trigger type	Set the data transmission timing. (☞ Page 28 Trigger type)
Application Type	Set control related to data communication. (☞ Page 31 Application Type)
Instance ID	Set a value for identifying data used for cyclic communication.
Tag Name	Specify which data held by the external device is accessed. (☞ Page 34 Instance ID and tag name)

*1 Set each item in "EtherNet/IP Configuration" of the engineering tool.

☞ Page 107 EtherNet/IP Configuration window

*2 If data is not received within the period of time in the following calculation formula, a connection timeout occurs.

$RPI \text{ (Requested Packet Interval)} \times \text{Timeout Multiplier}$

Example: When RPI is 100ms and Timeout Multiplier is $\times 8$, if data is not received within 800ms, a connection timeout occurs.

*3 When $(RPI \text{ (Requested Packet Interval)} \times \text{Timeout Multiplier})$ is greater than (timeout time on the socket communications side), even if a timeout in this setting does not occur, the connection may be closed due to the occurrence of a timeout on the socket communications side.

*4 After communication is interrupted due to a cable disconnection or an external device stoppage, a communication error may still be output even if communication is restored within the connection timeout time.

Point

Depending on the application type, data transmission can be set only for input or output.

When a connection set for only one of the input and output directions is used, a packet for checking the communication status (heartbeat) is transmitted for the unset direction to prevent the occurrence of timeouts.

Connection type

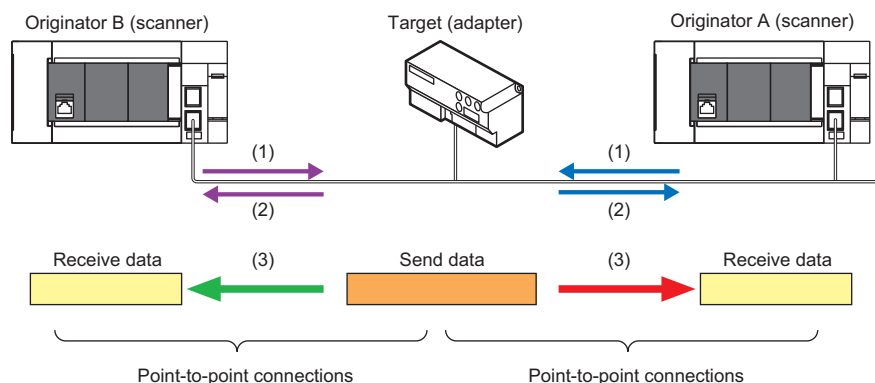
Set the data transmission method between the originator and the target.

For EtherNet/IP communications, the connection type can be set to point-to-point or multicast.

■Point-to-point

This connection type is set for one-to-one communication between the originator and the target.

When multiple originators establish a connection to one target through point-to-point, the target transmits a transmission frame for each originator separately through unicast.



- (1) Open a connection for which the connection type is set as point-to-point between the originator and the target.
- (2) The target returns a response (normal) to the originator.
- (3) The target transmits data through unicast.

■Multicast

This connection type allows multiple originators to receive data transmitted by one target.

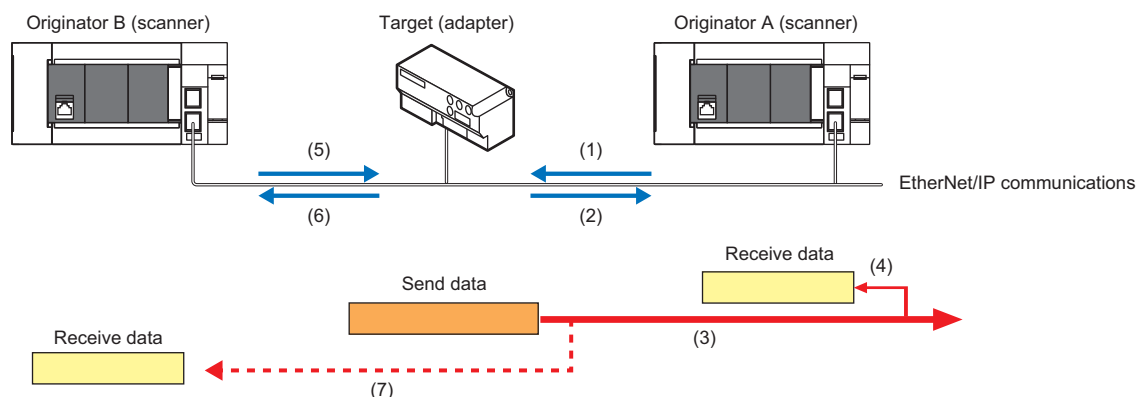
When multiple originators establish a connection through multicast, the target transmits end data for all the originators by using one multicast packet. In addition, by using an industrial switch with the IGMP snooping function, communication load on the network can be reduced.

Multicast can be used only for cyclic communication. It cannot be used with the message communication function (client) or the message communication function (server).

For the connection of the target communicating with an originator through multicast, when another originator opens a connection through multicast, the same connection settings^{*1} must be requested to the target.

If a request is made for communication based on connection settings different from those used for the active multicast communication, an error occurs.

^{*1} A connection setting in which all of the following are matched: RPI, connection type, data size, trigger type, instance ID (or tag name), and priority



- (1) Open a connection for which the connection type is set as multicast between originator A and the target.
- (2) The target returns a response (normal) to originator A.
- (3) The target transmits data using a multicast packet.
- (4) Originator A receives the multicast data transmitted in (3).
- (5) Originator B opens a connection with the same connection settings for the target.
(Connection settings with all of RPI, connection type, instance ID (or tag name), data size, trigger type, and priority being the same)
- (6) The target returns a response (normal) to originator B.
- (7) Originator B receives the multicast data transmitted in (3).

Trigger type

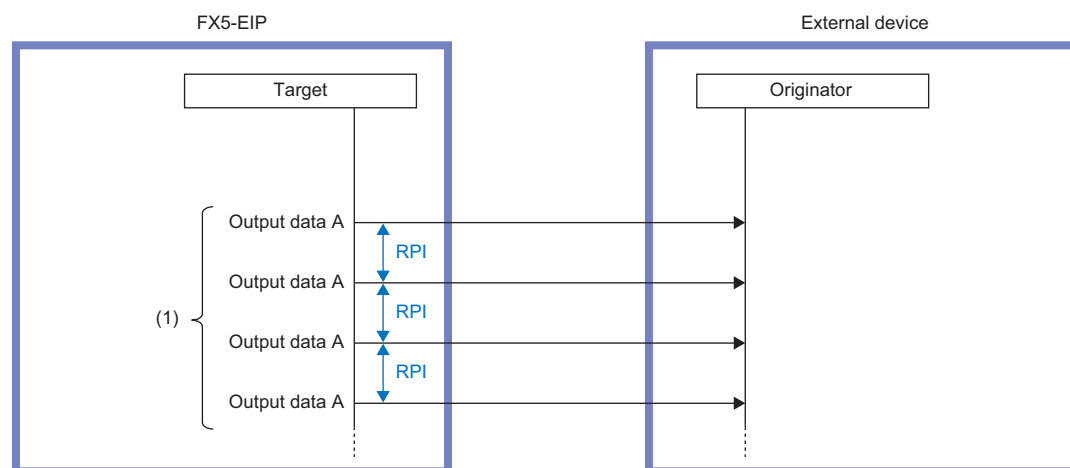
Set the data transmission timing.

The following table lists the trigger types supported by the FX5-EIP.

Trigger type	Description	Condition
Cyclic	Data is transmitted at intervals of the set RPI (communication cycle).	—
Application Trigger	Data is transmitted at any timing by the application.	Only when the FX5-EIP is the originator and the input type changes from target to originator
Change of State	Data is transmitted when an output data update is detected.	—

■Cyclic

Data is transmitted at intervals of the set RPI (communication cycle).



(1) Output data stored at the target side is automatically transmitted at RPI intervals.

■Application Trigger

Data transmitted at any timing by the application installed in the EtherNet/IP device is received.

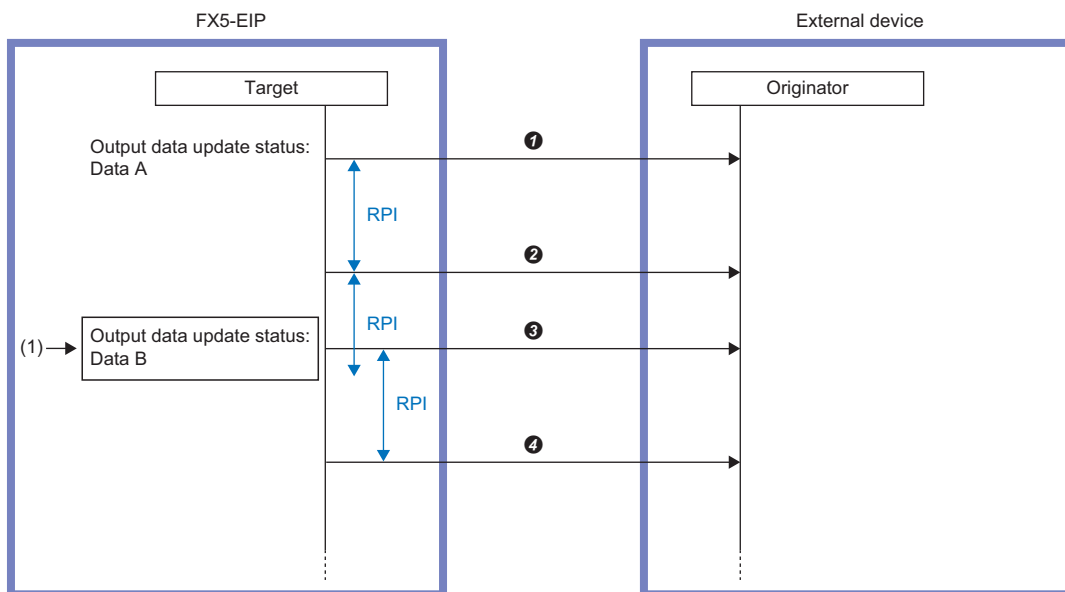
This setting is available only when the FX5-EIP is the originator.

When the FX5-EIP is the originator and the application type is Exclusive Owner, the transmission timing of output O->T is the same as when the trigger type is Change of State. ( Page 29 Change of State)

■Change of State

When an output data update is detected, a new frame is transmitted on the line.

If the RPI (communication cycle) time has elapsed since the last transmission without an output data update, a frame with the same transmission data as the previous one is automatically transmitted on the line to maintain the connection.

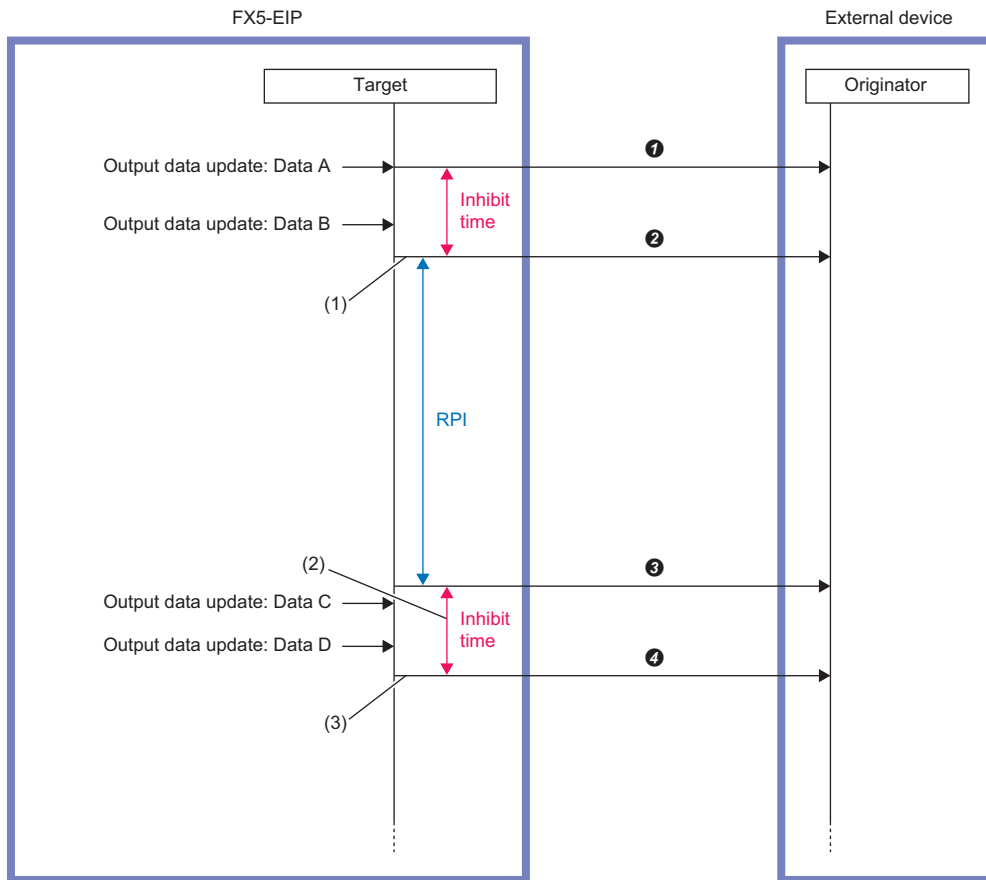


(1) Change of State communication triggered by output data update

- ① Transmitting of output data A upon update detection
- ② Transmitting of output data A upon RPI time lapse (automatic transmission)
- ③ Transmitting of output data B upon update detection (ignoring RPI interval)
- ④ Transmitting of output data B upon RPI time lapse (automatic transmission)

A new frame cannot be transmitted on the line before the time (inhibit time) specified for "Inhibit Time" has elapsed since the last transmission.

(Inhibit time is managed on a per-connection basis, so even if a particular connection is inhibited from transmitting, other connections will still be able to transmit.)



- (1) If the output data is updated within the time set for "Inhibit Time" since the last transmission, the transmission will wait until the Inhibit time has elapsed.
- (2) If the RPI (communication cycle) time has elapsed since the last transmission without a transmission data update, the data is automatically transmitted, and from that point on, transmission of new frames on the line is inhibited until the Inhibit time has elapsed.
- (3) If the transmission data is updated again while waiting for transmission, a frame with the last updated output data is transmitted on the line.
- ① Transmitting of output data A upon update detection
- ② Transmitting of output data B upon update detection
- ③ Transmitting of output data B upon RPI time lapse (automatic transmission)
- ④ Transmitting of output data D upon update detection

Point

- When the FX5-EIP is the originator, transmission triggered by output data update is possible only when the application type is Exclusive Owner. Because there is no output data except for Exclusive Owner, no transmission triggered by output data update can be performed. (If there is no output data, an alive check frame with data size of 0 called a heartbeat is transmitted to the target at the RPI interval set in "Output O->T".)
- When Change of State is used, use of auto refresh is recommended to prevent output data inconsistency. If auto refresh is not used, transmission triggered by output data update may occur continuously or some data may be lost.
- Continuous transmission of packets at intervals shorter than the minimum RPI available on the target side device may result in dropouts. Matching the "Inhibit Time" to the minimum RPI available on the target device is recommended.

Application Type

Set control related to data communication.

The following table shows the support by cyclic communication for each application type.

- When the FX5-EIP is the originator

○: Requests can be transmitted to the EtherNet/IP device, ×: Requests cannot be transmitted to the EtherNet/IP device, —: No combination

Communication method	Connection settings							
	Application Type	Trigger type			Input type (target to originator)		Output type (originator to target)	
		Cyclic	Application Trigger	Change of State	Fixed (fixed size) ^{*2}	Variable (variable size) ^{*2}	Fixed (fixed size) ^{*2}	Variable (variable size) ^{*2}
Instance communications	Exclusive Owner	○	○ ^{*4}	○	○	○	○	○ ^{*1}
	Input Only	○	○ ^{*4}	○	○	○	○	— ^{*3}
	Listen Only	○	○ ^{*4}	○	○	○	○	— ^{*3}
	Redundant Owner	×	×	×	×	×	×	×
Tag communications	Input Only	○	○ ^{*4}	○	○	○	○	— ^{*3}

*1 Connection requests can be set, but are transmitted from the FX5-EIP with a fixed size (value set for Size).

*2 Among the real time formats (RTF) specified by EDS in which requests can be accepted by the external device, to request the zero-length data format to the external device, it must be requested with Variable selected for the input type and output type.
To request the modeless format, 32-bit header format, or heartbeat to the external device, it must be requested with Fixed selected for the input type and output type.

*3 The data size of the heartbeat (alive check packet) used in the Input Only and Listen Only output types (originator to target) is fixed to 0 bytes.

*4 Cyclic communication can be received using an Application Trigger.

- When the FX5-EIP is the target

○: Requests can be accepted from the EtherNet/IP device, ×: Requests cannot be accepted from the EtherNet/IP device, —: No combination

Communication method	Connection settings							
	Application type	Trigger type			Output type (target to originator)		Input type (originator to target)	
		Cyclic	Application Trigger	Change of State	Fixed (fixed size) ^{*1}	Variable (variable size) ^{*1}	Fixed (fixed size) ^{*1}	Variable (variable size) ^{*1}
Instance communications	Exclusive Owner	○	×	○	○	×	○	×
	Input Only	○	×	○	○	×	○	— ^{*2}
	Listen Only	○	×	○	○	×	○	— ^{*2}
	Redundant Owner	×	×	×	×	×	×	×
Tag communications	Input Only	○	×	○	○	×	○	— ^{*2}

*1 For real time formats (RTF) for the input type (target to originator), requests can be accepted in modeless format only. For real time formats (RTF) for the output type (originator to target), requests can only be accepted in heartbeat when the application type is Input Only and can only be accepted in modeless format when the application type is Exclusive Owner.

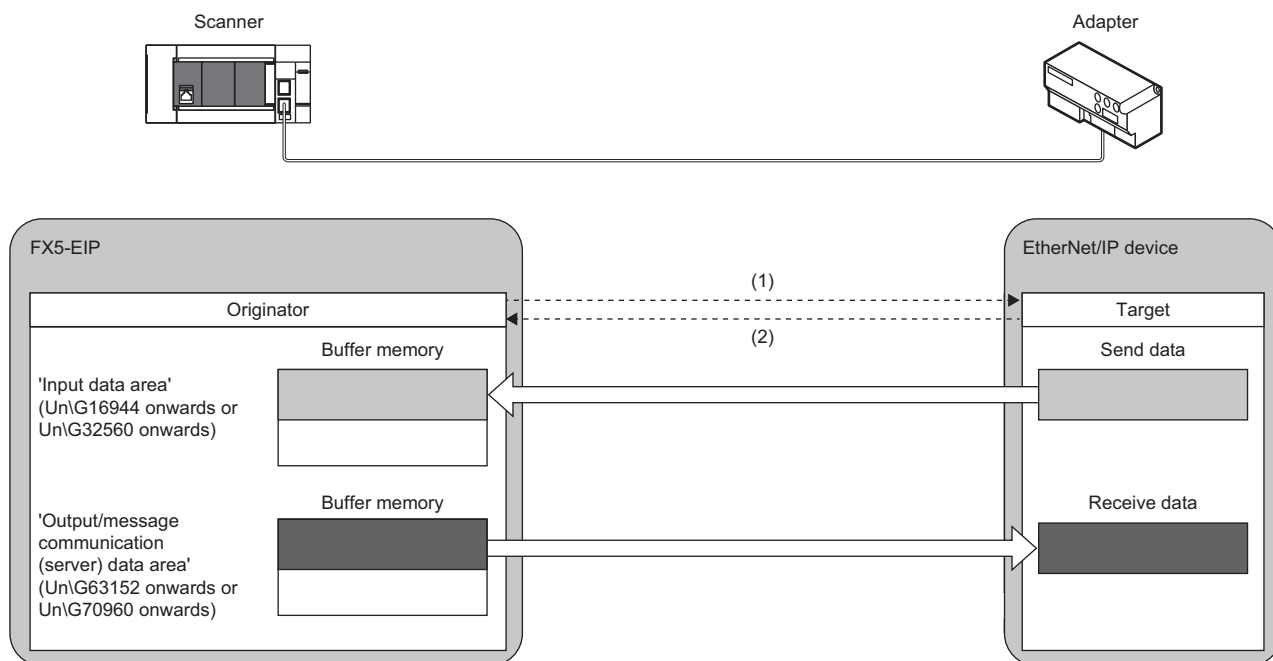
*2 The data size of the heartbeat (alive check packet) used in the Input Only and Listen Only output types (originator to target) is fixed to 0 bytes.

■Exclusive Owner (originator)

Data transmission from the FX5-EIP (originator) to the target and data reception from the target to the FX5-EIP (originator) can be set simultaneously.

In the above case, the external device must support Exclusive Owner.

The FX5-EIP supports both point-to-point and multicast for data receiving, and only point-to-point for data transmission.

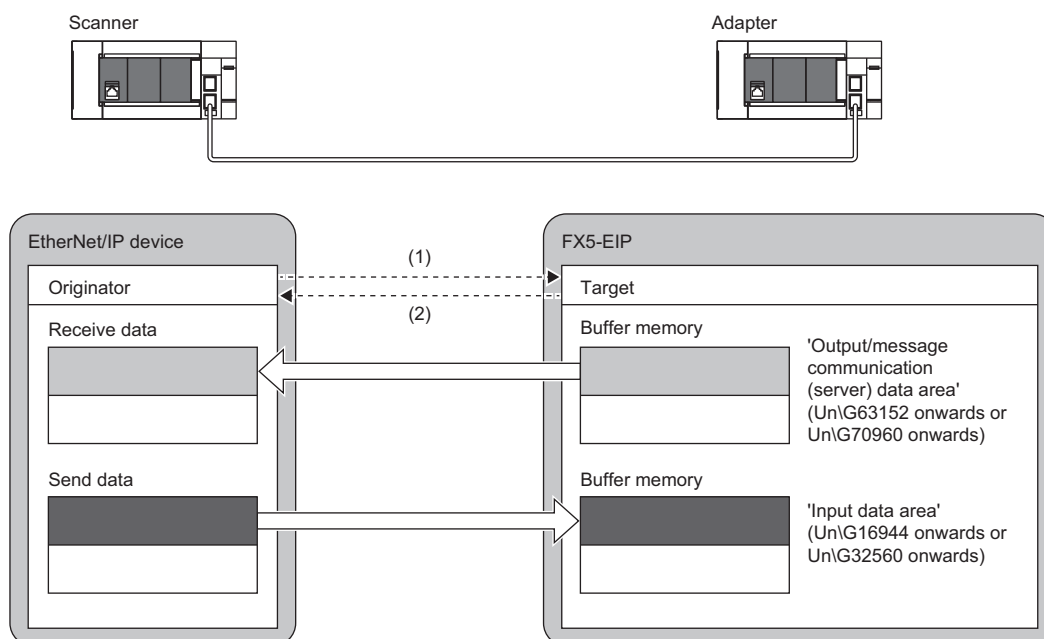


- (1) Connection open
- (2) Response (normal)

■Exclusive Owner (target)

Data transmission from the FX5-EIP (target) to the originator and data receiving from the originator to the FX5-EIP (target) can be set simultaneously.

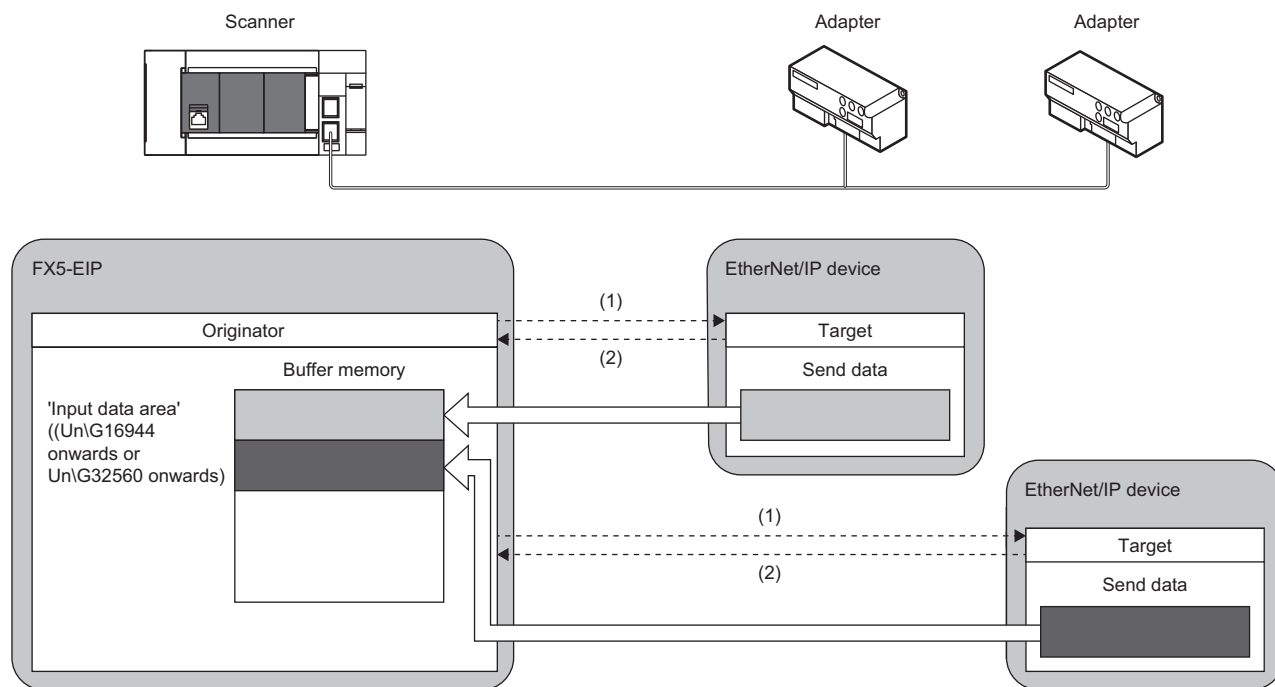
The FX5-EIP (target) supports only point-to-point for data receiving and both point-to-point and multicast for data transmission.



- (1) Connection open
- (2) Response (normal)

■Input Only (originator)

In this application type, only data receiving in the direction from the target to the FX5-EIP (originator) is possible. Both point-to-point and multicast are supported.



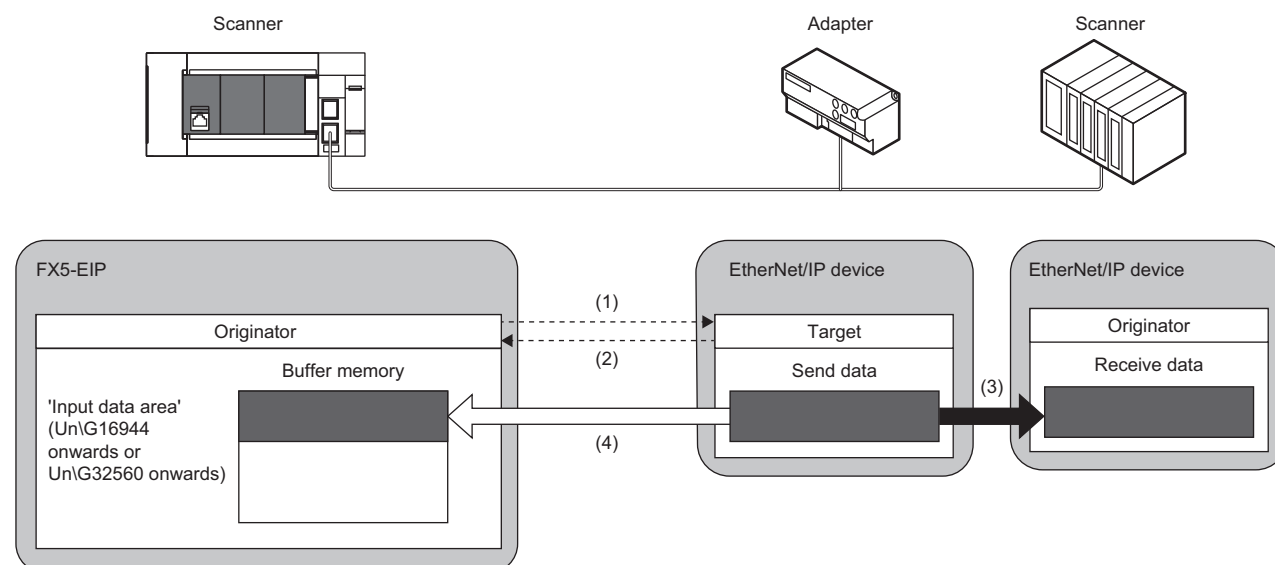
- (1) Connection open
- (2) Response (normal)

■Listen Only (originator)

This application type is for Exclusive Owner and Input Only, allowing only data receiving through multicast in the direction from the target where a multicast connection is already open to the FX5-EIP (originator).

A connection cannot be opened for an external device where a connection through multicast is not open.

If all multicast connections for which the application type for the target is not set to Listen Only are disconnected, even if connections opened by using Listen Only are normal, the target stops data transmission.



- (1) Connection open
- (2) Response (normal)
- (3) Data transmitted over an Input Only or Exclusive Owner connection (data transmission using a multicast packet)
- (4) The same data as (3) is received.

Instance ID and tag name

An instance ID and tag name are cyclic data ID numbers for communicating with the external device.

■ Instance ID

An instance ID is an ID number for cyclic data defined in an EDS file.

Cyclic data to be used for communications is set individually for each instance ID. (operating status, current value, sensor output, and other data)

When multiple connections are made to the same adapter, an instance ID can be set individually for each connection.

The instance IDs when using the FX5-EIP as a target are shown as follows.

Input/output (T: Target, O: Originator)	Instance ID
Input (T→O)	100 to 199, 768 to 895
Output (O→T) (When the application type is Input Only)	254 (fixed value)
Output (O→T) (When the application type is Listen Only)	255 (fixed value)
Output (O→T) (When the application type is Exclusive Owner)	100 to 199, 1024 to 1151

The instance ID is differentiated according to the following range.

- Instance ID: 768 to 895, 1024 to 1151

The instance ID is automatically determined by the specified connection number.

The following table lists relationships between the connection number and instance ID.

Input/output (T: Target, O: Originator)	Connection No. (Specified when setting up the FX5-EIP adapter)	Instance ID (Automatically generated according to the connection number)
Input (T→O)	1	768
	2	769
	⋮	767 + Connection No.
	127	894
	128	895
Output (O→T) (When the application type is Exclusive Owner)	1	1024
	2	1025
	⋮	1023 + Connection No.
	127	1150
	128	1151

- Instance ID: 100 to 199

Any number can be manually entered for the instance ID in the range of 100 to 199.

Use this range mainly when the FX5-EIP needs to be the target with the same settings as when the FX5-ENET/IP is the target.

When using an instance ID in the range of 100 to 199, set the instance ID in the range of 100 to 199 for both T→O and O→T. Also, select "FX5-ENET/IP compatible" for the connection on the originator side.

For details on the setting method, refer to the manual for the external device.

Point

- When the FX5-EIP is the target, using the FX5-EIP EDS file^{*1} for the setting tool of each device allows instance communications that target the FX5-EIP.
- When the FX5-EIP is the originator, using the EDS file for each device allows connection settings that target each device in "EtherNet/IP Configuration".

^{*1} Since the FX5-EIP EDS file is registered as the initial setting in "EtherNet/IP Configuration", it is not necessary to perform a new registration when the FX5-EIP is the originator. For details regarding the originator setting method when using another device as the originator, refer to the manual of each device.

■Tag name

A tag name is an ID number related to the tag settings registered in the external device.

Cyclic data to be used for communications is determined based on the tag name registered in the external device.

At first, as tag settings, the external device registers in itself the tag name and the combination of the tag name and the device assigned to it.

Then, when the FX5-EIP opens a connection for the tag of the external device, the external device transmits the data of the assigned device to the FX5-EIP at the RPI interval.

- Character strings that can be used in tag communication

The following table lists characters that can be used in tag communication.

Character ^{*1}	Description
One-byte alphanumeric characters ^{*2}	0 to 9, A to Z, a to z
Symbol	One-byte space, !, ", #, \$, %, &, ', (,), *, +, ,, -, ., /, :, ;, <, =, >, ?, @, [, \,], ^, _`, {, , }, ~

*1 The tag name must be between 1 and 255 characters.

*2 Tag names are not case-sensitive.

Point

If the external device is not the FX5-EIP, refer to the manual of the external device for details on how to set the tag to the external device.

Consistency check

The consistency check is a function used to check for consistency between the information of the target device set as the originator and the information of the target device that actually performs communication.

This function checks whether the EDS file information used by the originator to configure communication with the target matches the device information of the target that requested a connection to be established.

A connection is only established if this information matches.

■Target device information

The device information used for the consistency check is as follows.

- Vendor ID number (vendor code)
- Device type (product type)
- Product ID number (product code)
- Major revision
- Minor revision



It is possible to check the FX5-EIP device information setting values through the message communications support command identity object. For details, refer to the following.

☞ Page 257 Identity

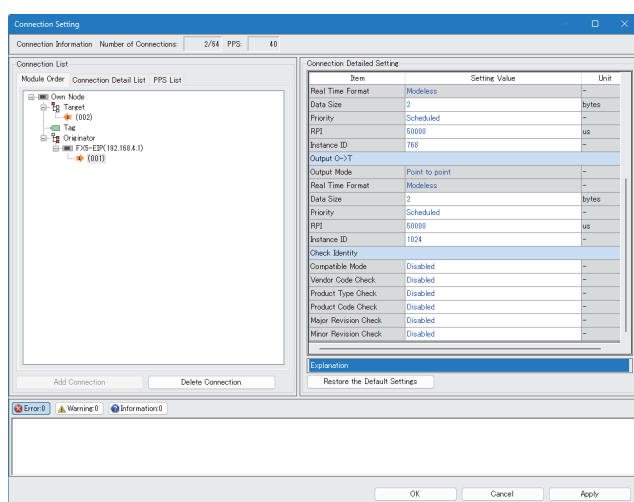
■Setting method

When the FX5-EIP is the target, refer to the manual of the originator (external device) for details on how to perform the consistency check.

If the consistency check fails, the following CIP code response is returned to the originator.

Response CIP code		Overview of CIP error	Information for the device that failed the consistency check
General Status	Extended Status		
01H	114H	Vendor code or product code mismatch	Vendor code
			Product code
	115H	Product type mismatch	Product type
	116H	Revision mismatch	Major revision
			Minor revision

If the FX5-EIP is the originator, whether to perform the consistency check on the target can be set via the "Connection Detailed Setting" window in "EtherNet/IP Configuration". (☞ Page 110 Connection Setting)



If the consistency check fails, the above CIP code is stored in 'Cyclic communication connection error status' (Un\G1392 onwards). (☞ Page 245 Connection behavior error status)

■Combinations of settings

A consistency check can be performed according to the combination of the compatibility mode enabled/disabled setting and the device information settings.

Point

This mode allows not only exact matches but also values that can be emulated by the target.

(Example: Accepting communications configured using an old minor revision EDS file for a target with a minor revision)

For the values that the target is able to emulate, refer to the manual of the target device.

The following table shows the relationship between the combination of consistency check settings and connection establishment/disconnection.

Detailed connection setting items		Connection establishment/disconnection according to the consistency check
Compatible Mode	Item name check ^{*1}	
Disabled	Disabled	A connection is established. (No consistency check)
	Enabled	A connection is established if the item name value is an exact match.
Enabled	Disabled ^{*2}	The connection is disconnected.
	Enabled	A connection is established if the item name value is an exact match or emulation is possible.

^{*1} The check includes "Vendor Code Check", "Product Type Check", "Product Code Check", "Major Revision Check", and "Minor Revision Check".

^{*2} This check cannot be set when "Compatible Mode" is set to "Enabled".

■If the consistency check fails

If the consistency check fails, check the following.

Item	Description
Check that no mistakes were existed when specifying the target IP address. ^{*1}	<ul style="list-style-type: none"> • Check that the set value is the same as the IP address of the target for communication. • Check that the IP address setting of the target for communication is correct.
Can the EDS file be used by the target for communication?	Check that the EDS file in use is neither a version-upgraded file nor an old EDS file.
Check that proper consistency check settings are being used.	Refer to the following to review the consistency check settings.  Page 37 Combinations of settings
Do the parameters of the target match the values in the EDS file?	Using the message communications support command, check that the following parameters match the values ^{*2} in the EDS file. ^{*3} ■Identity object (Class ID: 01H, Instance ID: 01H) ^{*4} <ul style="list-style-type: none"> • Attribute ID1: Vendor Id • Attribute ID2: Device Type • Attribute ID3: Product Code • Attribute ID4: Major Revision/Minor Revision • Attribute ID7: Product Name Although Attribute ID7 is not subject to the consistency check, whether it matches the name of the target to use can be checked.

^{*1} For the cyclic communication parameter settings, refer to the following.

 Page 99 Procedure for setting parameters

^{*2} These are the values for the device in the EDS file to be used.

^{*3} For details regarding how to use message communications support commands, refer to the following.

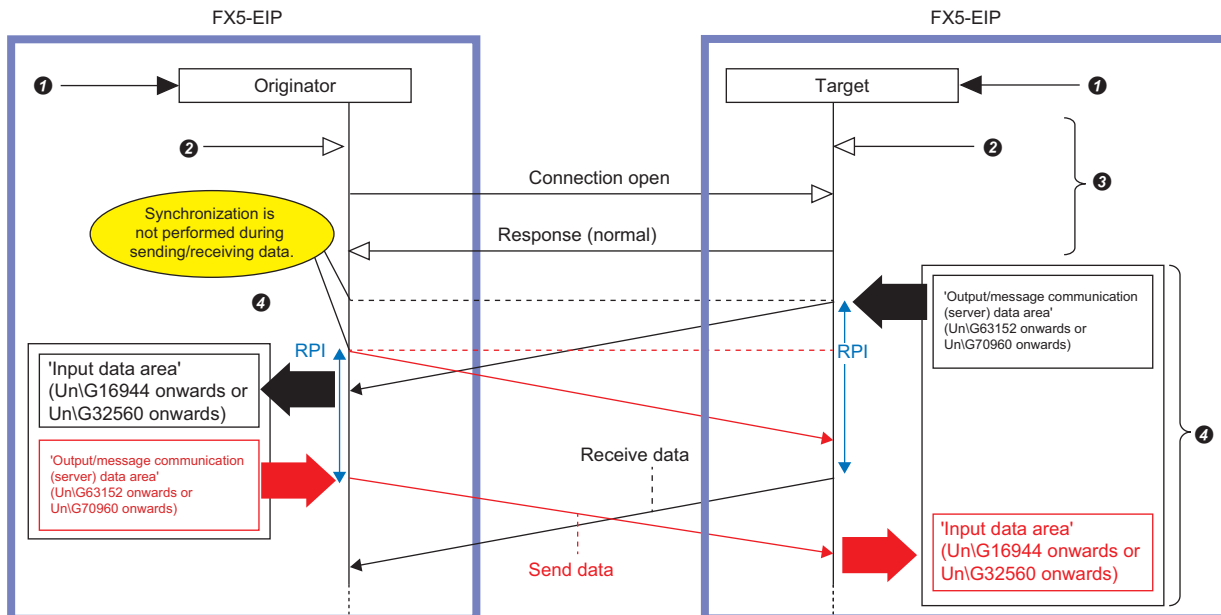
 Page 254 Details of Message Communication Support Command

^{*4} Depending on the target, there may be multiple instances of identification information. For more information regarding the instance ID to be specified in such a case, refer to the manual of the target.

Class1 instance communications

A connection to be opened is managed by using the IP address of the external device and instance ID, and data communications are performed periodically between the originator and the target.

The following figure shows data communications for which the application type is Exclusive Owner when the FX5-EIPs are the originator and the target.



- ❶ Write the Class1 instance communications connection settings.
- ❷ 'EtherNet/IP communication start status' (Un\G273) becomes 1 (Operating).
- ❸ A connection is established.
- ❹ Data are transmitted and received.

Point

Since the timing of data transmission differs between the originator and the target, the data communication timing is not synchronized. In addition, since RPI is managed on a connection basis, even when the same RPI is set, the data transmission timing per connection is not synchronized.

Data communications procedure

■When operating as originator

1. Connection settings

Set a connection in "EtherNet/IP Configuration". (☞ Page 107 EtherNet/IP Configuration window)

2. Establishing a connection

'EtherNet/IP communication start status' (Un\G273) becomes 1 (Operating) at the following timing, and a connection starts to open.

- A value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).
- When the EtherNet/IP communication automatic start function is enabled, the CPU module changes from STOP to RUN.

3. Transmitting/receiving data

When a connection is opened normally, data is transmitted/received at the RPI interval as follows. (When connection number is 1)

- The data transmitted from the target is stored in 'Input data area' (Un\G16944 onwards or Un\G32560 onwards).
- Data set in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards) of the originator is transmitted to the target.

■When operating as target

1. Connection settings

Set a connection in "EtherNet/IP Configuration". (☞ Page 107 EtherNet/IP Configuration window)

2. Establishing a connection

'EtherNet/IP communication start status' (Un\G273) becomes 1 (Operating) at the following timing, and a connection starts to open.

- A value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).
- When the EtherNet/IP communication automatic start function is enabled, the CPU module changes from STOP to RUN.

3. Transmitting/receiving data

When a connection is opened normally, data is transmitted/received at the RPI interval as follows. (When connection number is 1)

- The data transmitted from the originator is stored in 'Input data area' (Un\G16944 onwards or Un\G32560 onwards).
- Data set in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards) of the target is transmitted to the originator.

Point

For details on the buffer memory, refer to ☞ Page 107 EtherNet/IP Configuration window.

Connection settings

■When instance communications are performed with the FX5-EIP as the originator

When instance communications are performed using the FX5-EIP as the originator, the following settings are required.

- Check the instance ID set for the target. For the setting and checking method, refer to the manual for the external device.
Depending on the device used, a fixed value may be specified in the EDS file and it may not be described in the manual.
- Use "EtherNet/IP Configuration" to configure "scanner settings" for the FX5-EIP based on the instance ID set for the target.
For details on the FX5-EIP setting method, refer to  Page 107 EtherNet/IP Configuration window.

■When instance communications are performed with the FX5-EIP as the target

When instance communications are performed using the FX5-EIP as the target, the following settings are required.

- Use "EtherNet/IP Configuration" to configure "adapter settings" for the FX5-EIP. For details on the FX5-EIP setting method, refer to the following.  Page 107 EtherNet/IP Configuration window
- Set the originator device to perform communication with the instance ID that matches "adapter settings". For details on the setting method, refer to the manual for the external device.

For the instance IDs when using the FX5-EIP as a target, refer to the following.

 Page 34 Instance ID and tag name

Precautions

To start EtherNet/IP communications by setting a value other than 0 for 'EtherNet/IP communication start request' (Un\G272), set all 'Cyclic communication pause specification' (Un\G1360 onwards) to 0.

When 'Cyclic communication pause specification' (Un\G1360 onwards) is not all set to 0, EtherNet/IP communications will not start even if a value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).

In this case, 2 (Cannot start) is stored in 'EtherNet/IP communication start status' (Un\G273).

Input Only setting

This section describes the procedure for setting the target to the FX5-EIP and the application type to Input Only when performing Class1 instance communications. For details on Input Only, refer to the following.

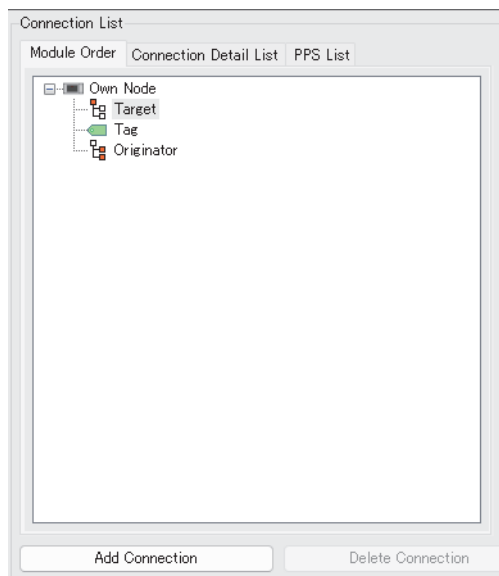
☞ Page 31 Application Type

■Target side setting method

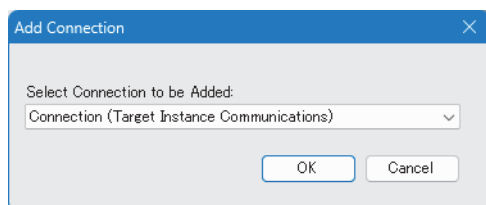
1. Open the "Connection Setting" window.

🔍 [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ FX5-EIP ⇒ [EtherNet/IP Configuration (Module Extended Parameter)] ⇒ <Detailed Setting>

2. Select a "Target" from the "Connection List" and click the [Add Connection] button.



3. Select "Connection (Target Instance Communications)" in "Select Connection to be Added:" and click the [OK] button.



4. Set "Application Type" to "Input Only".

5. Set the data size to be transmitted from the target to the originator in "Data Size".

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Target Instance Communications)	-
Application Type	Input Only	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Output T->O		
Data Size	200	bytes
Instance ID	768	-
Input O->T		
Data Size	-	-
Instance ID	-	-

4

Point

The instance ID on the target side is automatically calculated in accordance with the connection number value. For the relationship between the connection number and instance ID, refer to the following.

☞ Page 34 Instance ID and tag name

■Originator side setting method

1. Open the "EtherNet/IP Configuration" window.

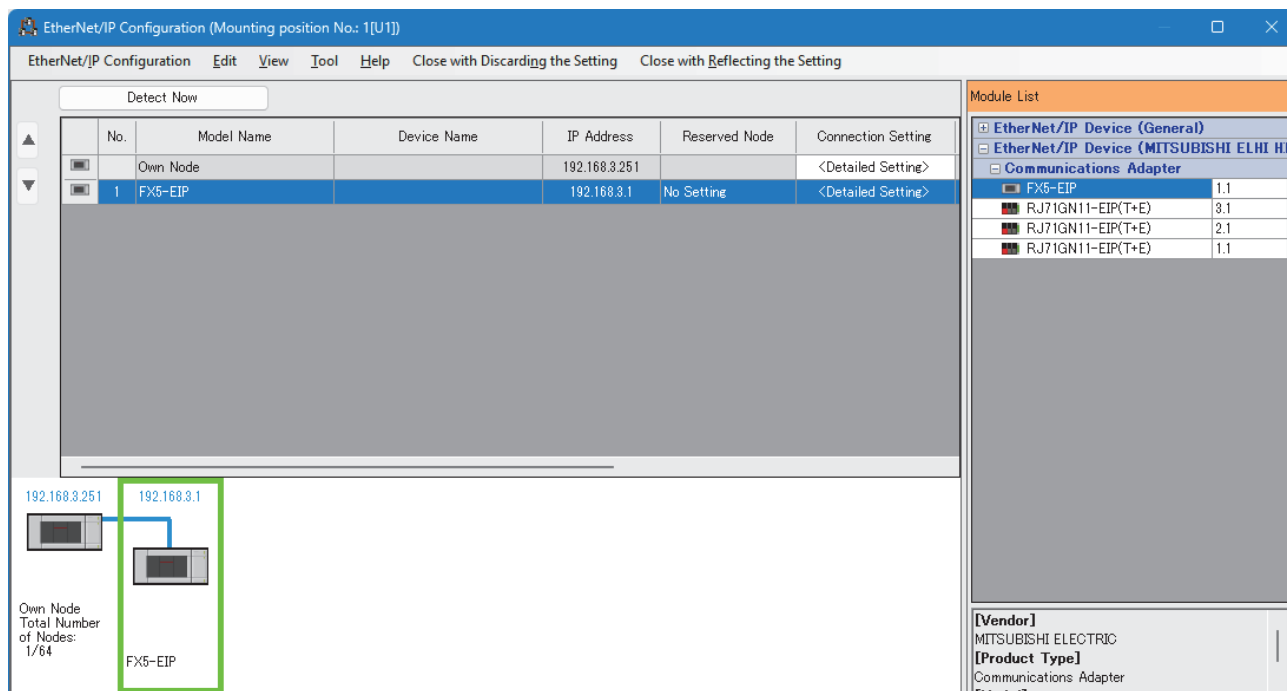
Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ FX5-EIP ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

2. Add the target device in "EtherNet/IP Configuration".

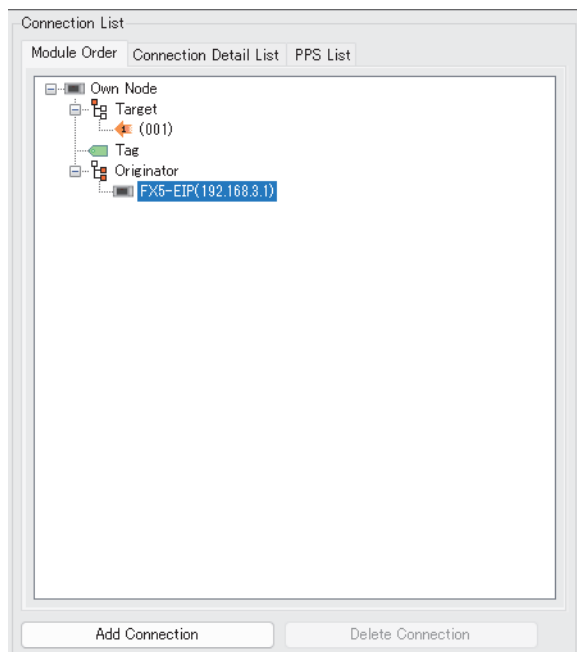
Using "Module List" [EtherNet/IP device (MITSUBISHI ELECTRIC)] ⇒ [Communications Adapter], drag and drop "FX5-EIP" to add.

If the target is a device other than the FX5-EIP, the EDS file registration is required. For how to register EDS files, refer to the following.

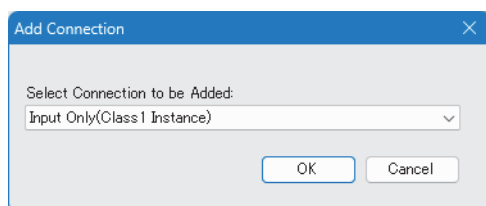
☞ Page 122 Adding/deleting the EDS file



3. Double-click "Detailed Setting" in the "Connection Setting" column of the FX5-EIP to open the "Connection List" window. Select "FX5-EIP" in "Connection List" and click the [Add Connection] button.



4. Select "Input Only (Class1 Instance)" in "Select Connection to be Added:" and click the [OK] button. If the target is not the FX5-EIP, the selection will change depending on the EDS file of the external device. For details, refer to the manual for the external device.



5. Set the "Data Size" of "Input T->O" to the same value as "Data Size" of "Output T->O" on the target side.
6. Set the "Instance ID" of "Input T->O" to the same value as the "Instance ID" of "Output T->O" on the target side.

Originator			Target		
Connection Detailed Setting			Connection Detailed Setting		
Item	Setting Value	Unit	Item	Setting Value	Unit
Connection Name	Input Only(Class1 Instance)	-	Connection Name	Connection (Target Instance Communications)	-
Application Type	Input Only	-	Application Type	Input Only	-
Connection No.	001	-	Connection No.	001	-
Communication Method	Instance Communications	-	Communication Method	Instance Communications	-
Comment		-	Comment		-
Trigger Type	Cyclic	-	Output T->O		
Inhibit Time Mode	Default	-	Data Size	200 (1)	bytes
Inhibit Time	12	ms	Instance ID	768 (2)	-
Timeout Multiplier	x4	-	Input O->T		
Configuration Instance	1	-	Data Size	-	-
Input T->O			Instance ID	-	-
Input Mode	Point to point	-			
Real Time Format	Modeless	-			
Data Size	200 (1)	bytes			
Priority	Scheduled	-			
RPI	50000	us			
Instance ID	768 (2)	-			

In the "Setting Value" column, set the same value to the corresponding fields to which the same number is assigned.



When using a target other than the FX5-EIP, refer to the manual for the applicable product for information on how to set and check the target instance ID.

Exclusive Owner setting

This section describes the setting procedure and restrictions to be applied when the target is set to the FX5-EIP and the application type is set to Exclusive Owner when performing Class1 instance communications. For Exclusive Owner, refer to the following.

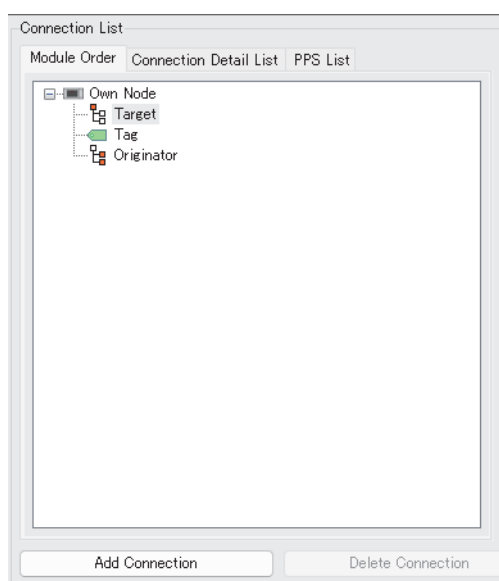
☞ Page 31 Application Type



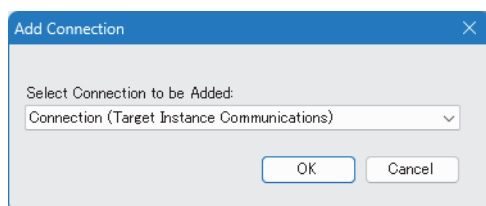
Exclusive Owner can only be set when performing Class1 instance communications.

■Target side setting method

1. Open the "Connection Setting" window.
☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ FX5-EIP ⇒ [EtherNet/IP Configuration (Module Extended Parameter)] ⇒ <Detailed Setting>
2. Select a "Target" from "Connection List" and click the [Add Connection] button.



3. Select "Connection (Target Instance Communications)" in "Select Connection to be Added:" and click the [OK] button.



4. Set "Application Type" to "Exclusive Owner".
5. Set the data size to be transmitted from the target to the originator in "Data Size".

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Target Instance Communications)	-
Application Type	Exclusive Owner	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Output T→O		
Data Size	2	bytes
Instance ID	768	-
Input O→T		
Data Size	2	bytes
Instance ID	1024	-

6. Set the data size that the target should receive from the originator in "Data Size" under "Input O->T".

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Target Instance Communications)	-
Application Type	Exclusive Owner	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Output T->O		
Data Size	200	bytes
Instance ID	768	-
Input O->T		
Data Size	300	bytes
Instance ID	1024	-

Point

The instance ID on the target side is automatically calculated in accordance with the connection number value. For the relationship between the connection number and instance ID, refer to the following.
 ➡ Page 34 Instance ID and tag name

■Originator side setting method

1. Open the "EtherNet/IP Configuration" window.

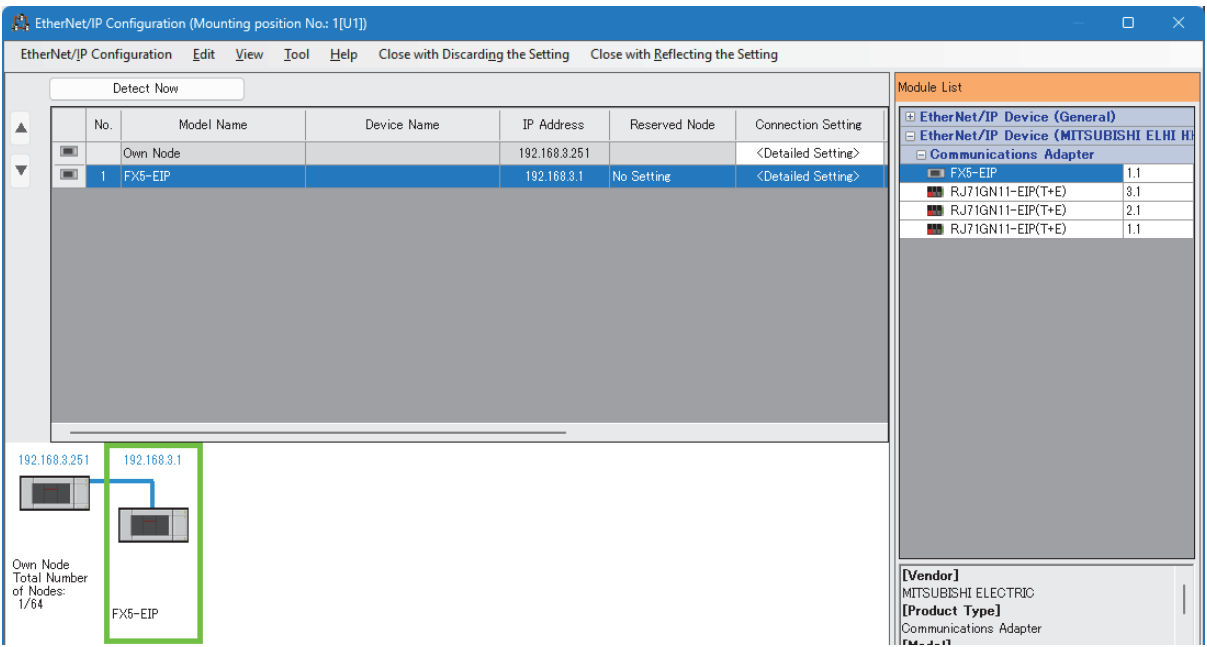
Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ FX5-EIP ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

2. Add the target device in "EtherNet/IP Configuration".

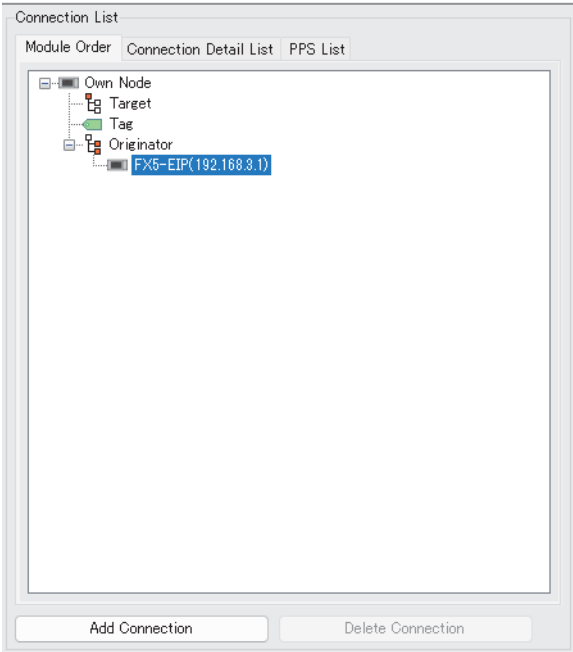
Using "Module List" [EtherNet/IP device (MITSUBISHI ELECTRIC)] ⇒ [Communications Adapter], drag and drop "FX5-EIP" to add.

If the target is a device other than the FX5-EIP, the EDS file registration is required. For how to register EDS files, refer to the following.

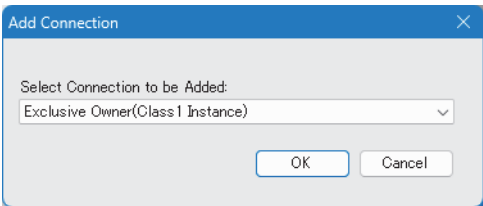
➡ Page 122 Adding/deleting the EDS file



3. Double-click "Detailed Setting" in the "Connection Setting" column of the FX5-EIP to open the "Connection List" window. Select "Originator" from "Connection List" and click the [Add Connection] button.



4. Select "Exclusive Owner(Class1 Instance)" in "Select Connection to be Added:" and click the [OK] button. If the target is not the FX5-EIP, the selection will change depending on the EDS file of the external device. For details, refer to the manual for the external device.



- 5. Set "Data Size" (1) of "Input T->O" to the same value as "Data Size" (1) of "Output T->O" on the target side.
- 6. Set "Instance ID"(2) of "Input T->O" to the same value as "Instance ID" (2) of "Output T->O" on the target side.
- 7. Set "Data Size" (3) of "Output O->T" to the same value as "Data Size" (3) of "Input O->T" on the target side.
- 8. Set "Instance ID" (4) of "Output O->T" to the same value as "Instance ID" (4) of "Input O->T" on the target side.

Originator

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Exclusive Owner(Class1 Instance)	-
Application Type	Exclusive Owner	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Trigger Type	Cyclic	-
Inhibit Time Mode	Default	-
Inhibit Time	12	ms
Timeout Multiplier	x4	-
Configuration Instance	1	-
Input T->O		
Input Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	2 (1)	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	768 (2)	-
Output O->T		
Output Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	2 (3)	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	1024 (4)	-

Target

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Target Instance Communications)	-
Application Type	Exclusive Owner	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Output T->O		
Data Size	2 (1)	bytes
Instance ID	768 (2)	-
Input O->T		
Data Size	2 (3)	bytes
Instance ID	1024 (4)	-

In the "Setting Value" column, set the same value to the corresponding fields to which the same number is assigned.

When using a target other than the FX5-EIP, refer to the manual for the applicable product for information on how to set and check the target instance ID.

■Precautions for operation of Exclusive Owner (target)

When setting the instance ID on the originator side, check that the following are the same value.

- "Instance ID" (1) of "Input T->O" on the originator side and "Instance ID" (1) of "Output T->O" on the target side
- "Instance ID" (2) of "Output O->T" on the originator side and "Instance ID" (2) of "Input O->T" on the target side

If the instance IDs do not match, a CIP Extended error occurs and communication becomes impossible. (Page 200 Error codes when a connection error occurs)

Originator

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Exclusive Owner(Class1 Instance)	-
Application Type	Exclusive Owner	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Trigger Type	Cyclic	-
Inhibit Time Mode	Default	-
Inhibit Time	12	ms
Timeout Multiplier	x4	-
Configuration Instance	1	-
Input T->O		
Input Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	2	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	768 (1)	-
Output O->T		
Output Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	2	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	1024 (2)	-

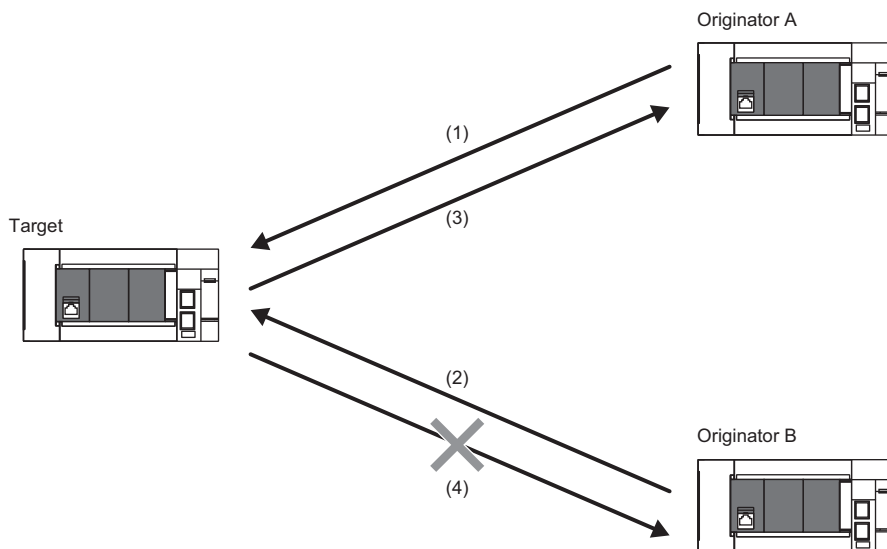
Target

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Target Instance Communications)	-
Application Type	Exclusive Owner	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Output T->O		
Data Size	2	bytes
Instance ID	768 (1)	-
Input O->T		
Data Size	2	bytes
Instance ID	1024 (2)	-

In the "Setting Value" column, set the same value to the corresponding fields to which the same number is assigned.

- Transmit a single connection establishment request to one "Input O->T" instance ID on the target side. Exclusive Owner can only receive data from one originator for each connection set to the adapter. When one "Input O->T" instance ID on the target side receives multiple connection establishment requests, only the connection establishment request received first is achieved*1 and a CIP Extended error (General Status: 01H, Extended Status: 0106H) occurs for other connection establishment requests. (Page 200 Error codes when a connection error occurs)

*1 Only the first connection establishment request received is achieved. Therefore, the connected originator may be changed each time the system is started.



- (1) Originator A transmits a connection establishment request to target connection number n (n: 1 to 128).
- (2) Originator B transmits a connection establishment request to target connection number n (n: 1 to 128).
- (3) The connection establishment request from originator A is received and originator A and connection number n (n: 1 to 128) start communicating.
- (4) As connection number n (n: 1 to 128) has already started communicating with originator A, a CIP Extended error (General Status: 01H, Extended Status: 0106H) occurs upon the connection establishment request from originator B and communication with originator B fails.

Point

- When transmitting "Output T->O" data by multicast to two or more originators for a target that has already established a connection with Exclusive Owner, use Input Only or Listen Only in combination. (📖 Page 48 Operation for when both Exclusive Owner and Input Only are used)

■Operation for when both Exclusive Owner and Input Only are used

The following operation can be executed by using both Exclusive Owner and Input Only.

- Target side: Data transmission to multiple originators through multicast
- Originator side: Data transmission to the target

For this operation, set "Input Mode" under "Input T->O" on the originator side to "Multicast".

1. Open the "Connection Setting" window on the originator side.

🔗 [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ FX5-EIP ⇒ [EtherNet/IP Configuration (Module Extended Parameter)] ⇒ <Detailed Setting>

2. Set "Input Mode" under "Input T->O" to "Multicast".

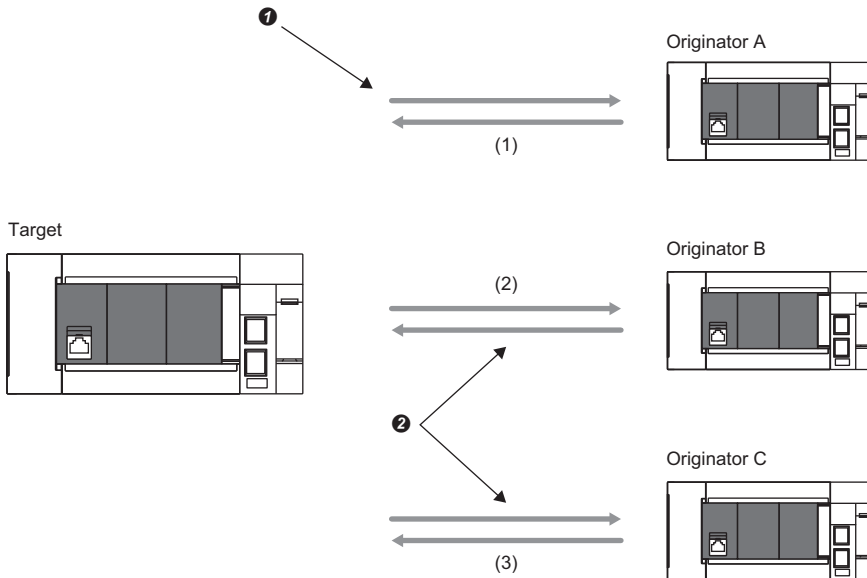
Input T->O		
Input Mode	Multicast	-
Real Time Format	Modeless	-
Data Size	200	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	768	-

Ex.

When performing communications with originator A by using Exclusive Owner while performing communications with originators B and C by using Input Only

While receiving the data transmitted from originator A, the target can transmit the same data to originators A to C through multicast.

- Before communications start



(1) Originator A and the target are connected via connection number 1 (Exclusive Owner (Class1 instance communications)).

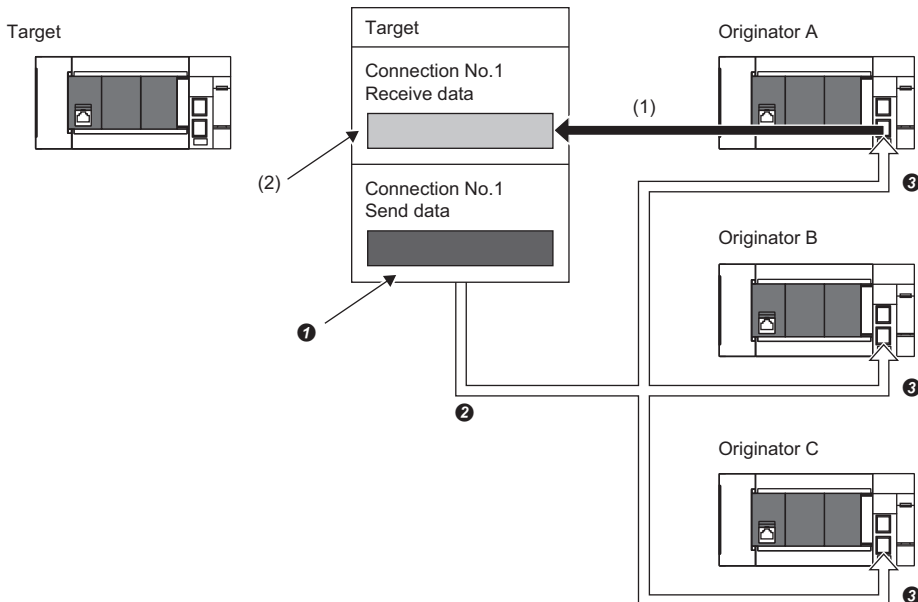
(2) Originator B and the target are connected via connection number 1 (Input Only (Class1 instance communications)).

(3) Originator C and the target are connected via connection number 1 (Input Only (Class1 instance communications)).

① The target-to-originator instance ID is set to 768 and the originator-to-target instance ID is set to 1024.

② The target-to-originator instance ID is set to 768 and the originator-to-target instance ID is set to 254.

- During communication



(1) Originator A transmits data to the target.

(2) Data received from originator A is stored in 'Input data area' (Un\G16944 onwards or Un\G32560 onwards) (connection number 1).

① Data transmitted from the target to each originator is stored in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards) (connection number 1).

② The target transmits data to each originator through multicast.

③ Data transmitted from the target is received.

Buffer memory operation

For the buffer memory operation of Class1 instance communications, refer to the following.

Page 125 For Class1 instance communications (originator, target) (Exclusive Owner)

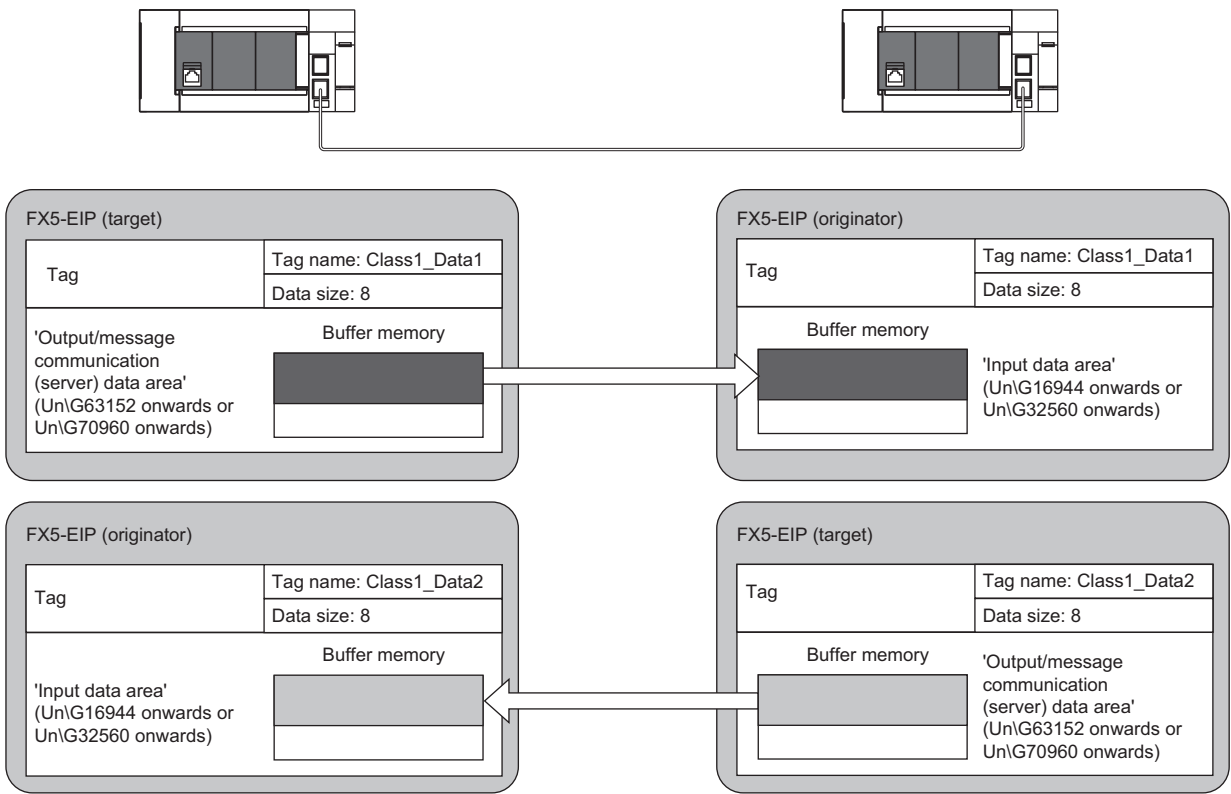
Class1 tag communications

This method of communications manages a connection to be opened by using the IP address and tag name of the external device.

A connection is opened between tags with the same tag name and same data size to perform data communications periodically.

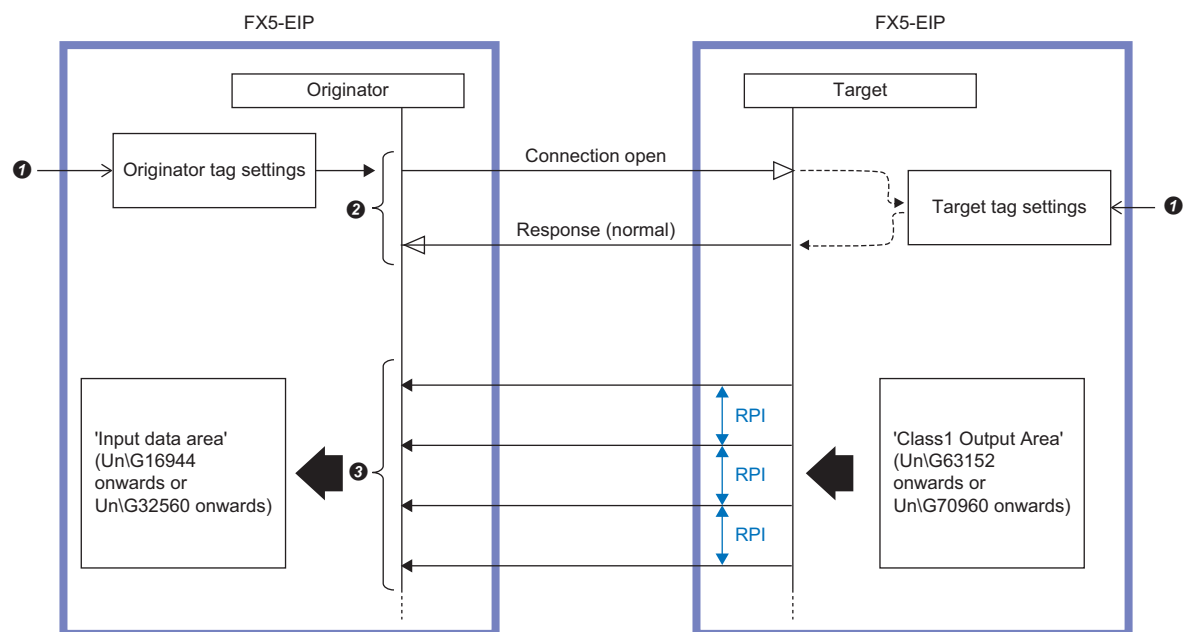
In tag communications, data communications can be performed only in a single direction: from the tag set by the target to the tag set by the originator. To perform data communication both ways, both sides need to become originators.

In addition, since RPI is managed on a connection basis, even when multiple targets communicate with the same tag, their data transmission timings are not synchronized.



Type	Description
Target-side tag	Receives a connection open request from the originator to be communicated with, and transmits data to the tag with the same name.
Originator-side tag	Transmits a connection open request to the target to be communicated with, and receives data from the tag with the same name.

The following figure shows flow of tag communication when the FX5-EIP is the originator and the target.



- ❶ Write the Class1 tag communications connection settings.
- ❷ When the tag names and data sizes of the target-side tag and originator-side tag match, a connection opens.
- ❸ Data stored at the target side is transmitted at RPI intervals.

Data communications procedure

■When operating as originator

1. Connection settings

Set a connection in "EtherNet/IP Configuration". (☞ Page 107 EtherNet/IP Configuration window)

2. Establishing a connection

'EtherNet/IP communication start status' (Un\G273) becomes 1 (Operating) at the following timing, and a connection starts to open.

- A value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).
- When the EtherNet/IP communication automatic start function is enabled, the CPU module changes from STOP to RUN.

3. Transmitting/receiving data

When a connection is opened normally, data is transmitted/received at the RPI interval as follows. (When connection number is 1)

- The data transmitted from the target is stored in 'Input data area' (Un\G16944 onwards or Un\G32560 onwards).

■When operating as target

1. Connection settings

Set a connection in "EtherNet/IP Configuration". (☞ Page 107 EtherNet/IP Configuration window)

2. Establishing a connection

'EtherNet/IP communication start status' (Un\G273) becomes 1 (Operating) at the following timing, and a connection starts to open.

- A value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).
- When the EtherNet/IP communication automatic start function is enabled, the CPU module changes from STOP to RUN.

3. Transmitting/receiving data

When a connection is opened normally, data is transmitted/received at the RPI interval as follows. (When connection number is 1)

- Data set in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards) of the target is transmitted to the originator.

Connection settings

■When tag communication is performed with the FX5-EIP as the originator

When tag communication is performed using the FX5-EIP as the originator, the following settings are required.

- Check the tag name set for the target. For the setting and checking method, refer to the manual for the external device.
- Use "EtherNet/IP Configuration" to configure "scanner settings" for the FX5-EIP based on the tag name set for the target.

For details on the FX5-EIP setting method, refer to the following.

 Page 107 EtherNet/IP Configuration window

■When tag communication is performed with the FX5-EIP as the target

When tag communication is performed using the FX5-EIP as the target, the following settings are required.

- Use "EtherNet/IP Configuration" to configure "adapter settings" for the FX5-EIP. For details on the FX5-EIP setting method, refer to the following.

 Page 107 EtherNet/IP Configuration window

- Set it so communication is performed for the tag name set in the originator device. For the setting and checking method, refer to the manual for the external device.

Precautions

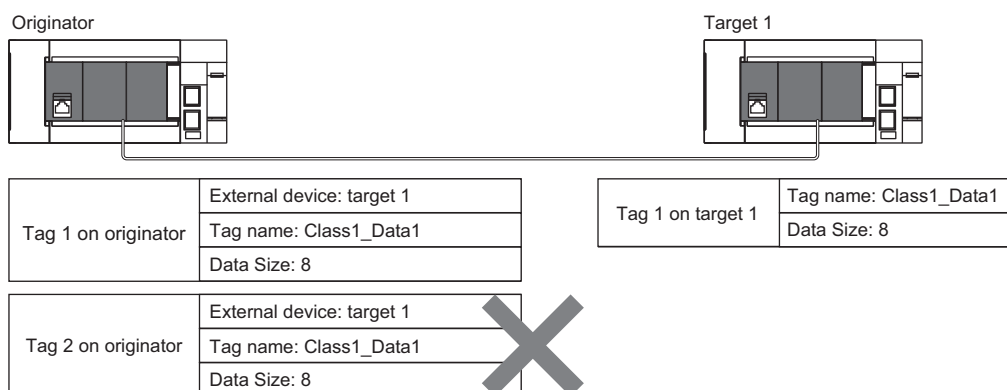
Tag communications cannot be executed depending on the connection setting details.

The following figures show the conditions under which tags cannot be set in the FX5-EIP or tag communication cannot be performed.

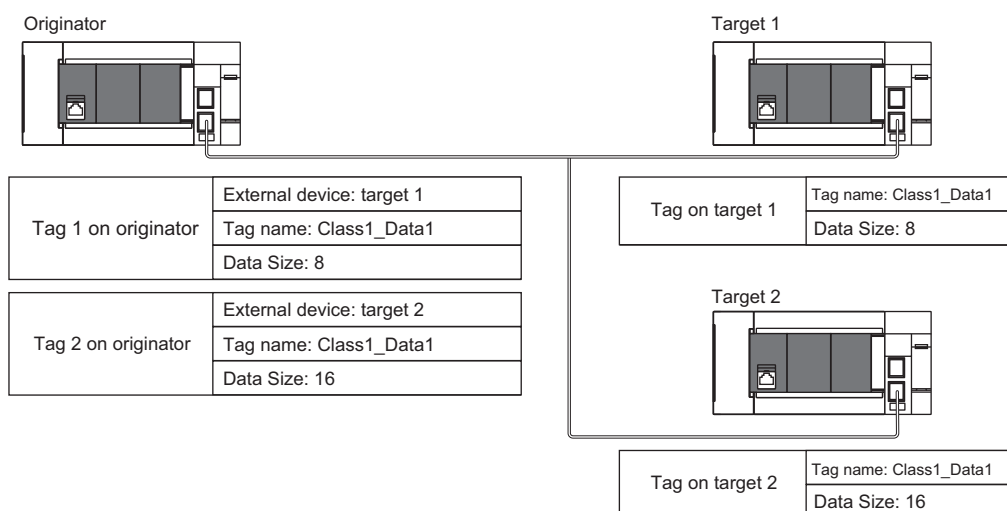
- Tags with the same name cannot be set in the FX5-EIP regardless of the data size. (Tag names are not case-sensitive.)



- The setting for opening multiple connections for the tag held by the external device cannot be configured. (Multiple tags with the same tag name cannot be set for one external device.) (Tag names are not case-sensitive.)



However, for tags with the same tag names held by different external devices, a connection can be opened individually. In this case, since they are independent, the connection settings do not need to be the same. (Including data sizes)



- If the data size of the tag on the target side differs from the data size of the tag on the originator side, communication may not be possible.
- If the data size of the tag on the target side differs from the data size of the tag on the originator side, the target may return an error response to the originator.

Condition	Result
When the FX5-EIP is the target	An error response is transmitted to the originator.
When the FX5-EIP is the originator	The result depends on the operation of the target. Therefore, refer to the manual for the external device.

Buffer memory operation

■When the FX5-EIP is the originator

For details on the buffer memory operation, refer to the following.

☞ Page 126 For Class1 tag communications (originator) (Input Only)

■When the FX5-EIP is the target

For details on the buffer memory operation, refer to the following.

☞ Page 126 For Class1 tag communications (target) (Input Only)

Cyclic communication stop and restart

Stop or restart of cyclic communication is enabled individually for each connection with 'Cyclic communication pause specification' (Un\G1360 onwards).

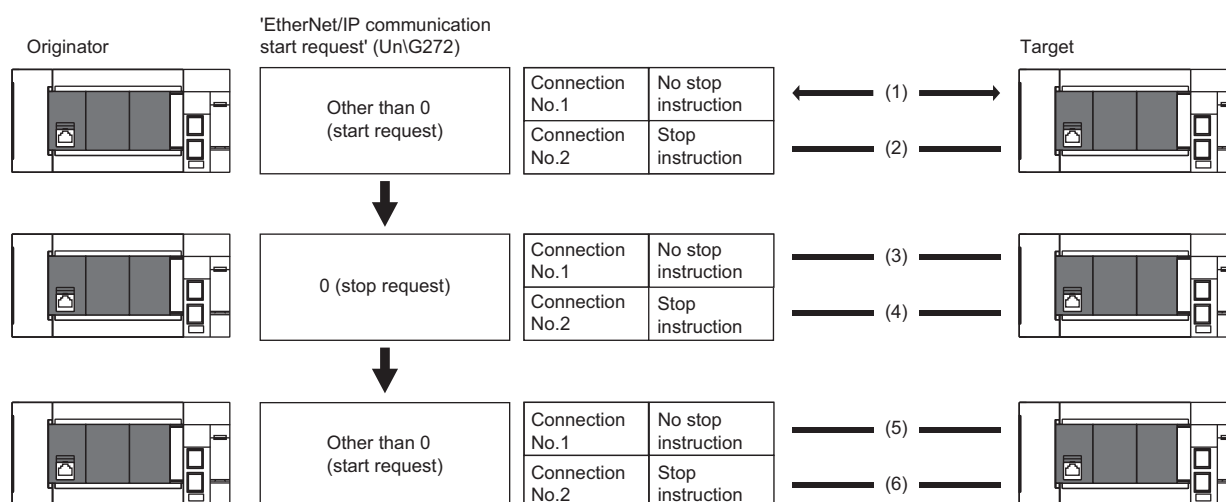
When the bit corresponding to the connection number to be stopped is turned on, cyclic communication stops, and when that bit is turned off, cyclic communication restarts.

If any bit of 'Cyclic communication pause specification' (Un\G1360 onwards) is turned on, EtherNet/IP communications will not start even if a value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).

The following buffer memory areas are used to stop and restart cyclic communication.

'EtherNet/IP communication start request' (Un\G272)	Corresponding bit of 'Cyclic communication pause specification' (Un\G1360 onwards)	Cyclic communication status
0 (stop request)	Off: Pause not specified	All cyclic communications are stopped.
Other than 0 (start request)	Off: Pause not specified	Cyclic communication starts.
	On: Pause specified	Cyclic communication pauses.

Even if 'EtherNet/IP communication start request' (Un\G272) is changed from a value other than 0 to 0, 'Cyclic communication pause specification' (Un\G1360 onwards) will not be cleared. Therefore, even if 'EtherNet/IP communication start request' (Un\G272) is changed from a value other than 0 to 0 and back to a value other than 0, EtherNet/IP communication will not start again. When starting EtherNet/IP communication with any bit of 'Cyclic communication pause specification' (Un\G1360 onward) is turned on, clear 'Cyclic communication pause specification' (Un\G1360 onwards) before setting 'EtherNet/IP communication start request' (Un\G272) to a value other than 0.



- (1) Connection number 1: Communicating
 (2) Connection number 2: Stopped
 (3) Connection number 1: Stopped (transitioning to Stopped)
 (4) Connection number 2: Stopped
 (5) Connection number 1: Stopped (remaining stopped) → EtherNet/IP communications do not start.
 (6) Connection number 2: Stopped (remaining stopped)

Point

When cyclic communication is stopped, the operation is performed as follows.

- The originator side performs connection close processing to stop cyclic communication. A connection timeout does not occur on the target side.
- The target side only stops cyclic communication. A connection timeout occurs on the originator side.

Setting method

Stop and start cyclic communication by the following setting methods.

Item	Setting method
To stop cyclic communication	Turn on the corresponding connection number bit of 'Cyclic communication pause specification' (Un\G1360 onwards).
To restart cyclic communication	Turn off the corresponding connection number bit of 'Cyclic communication pause specification' (Un\G1360 onwards).

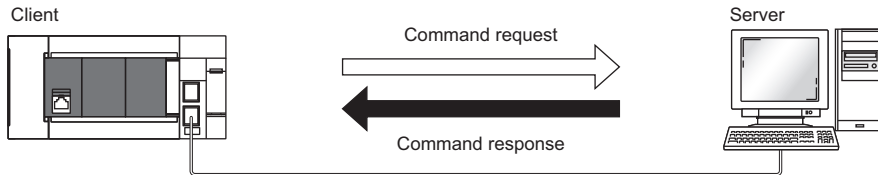
For details on the buffer memory, refer to the following.

 Page 245 Cyclic communication pause

4.3 Message Communication Function (Client)

Function overview

This function performs message communications through point-to-point between the client (message transmitting side) and the server (message receiving and processing side).



The available functions include the general message communication client function for transmitting data at any timing by using message communication support commands and the tag communication client function for reading/writing data for the tag set to the server.

However, if the external device does not support the specified command request or tag communications, an error response is returned.

Point

- For details on the message communication support commands, refer to the following.

➔ Page 254 Details of Message Communication Support Command

The message communication function (client) has the following communication methods.

Communication method	Connection	Message setting method	Description	Application
Class3 instance communications	Available	"EtherNet/IP Configuration"	A function for performing message communications for the server	Used when transmitting a message for purposes such as monitoring.
UCMM instance communications	Not available	Buffer memory		Used when transmitting a message as needed.
Class3 tag communications	Available	"EtherNet/IP Configuration"	A function for reading from/writing to the server device by using the tag name	Used when the communication method is Connected and when reading/writing the value of the device with a priority lower than Class1.
UCMM tag communications	Not available	Buffer memory		Used when the communication method is Unconnected and when reading/writing the value of the device with a priority lower than Class1.

■Message communications

Class3 (connected) and UCMM (unconnected) message communications are supported. Messages are transmitted to the server.

Data and parameters of the external device can be read/written according to the command request set in the message to be transmitted.

■Tag communications

Class3 (connected) and UCMM (unconnected) message communications are supported, Read/write requests can be transmitted to the tag set to the server.

In tag communications of message communication, the request-transmitting side is called the "client", and the request-receiving side is called the "server".

To use tag communications, the server side must support the tag communications server function.

The following table lists the processing for command requests transmitted by the client.

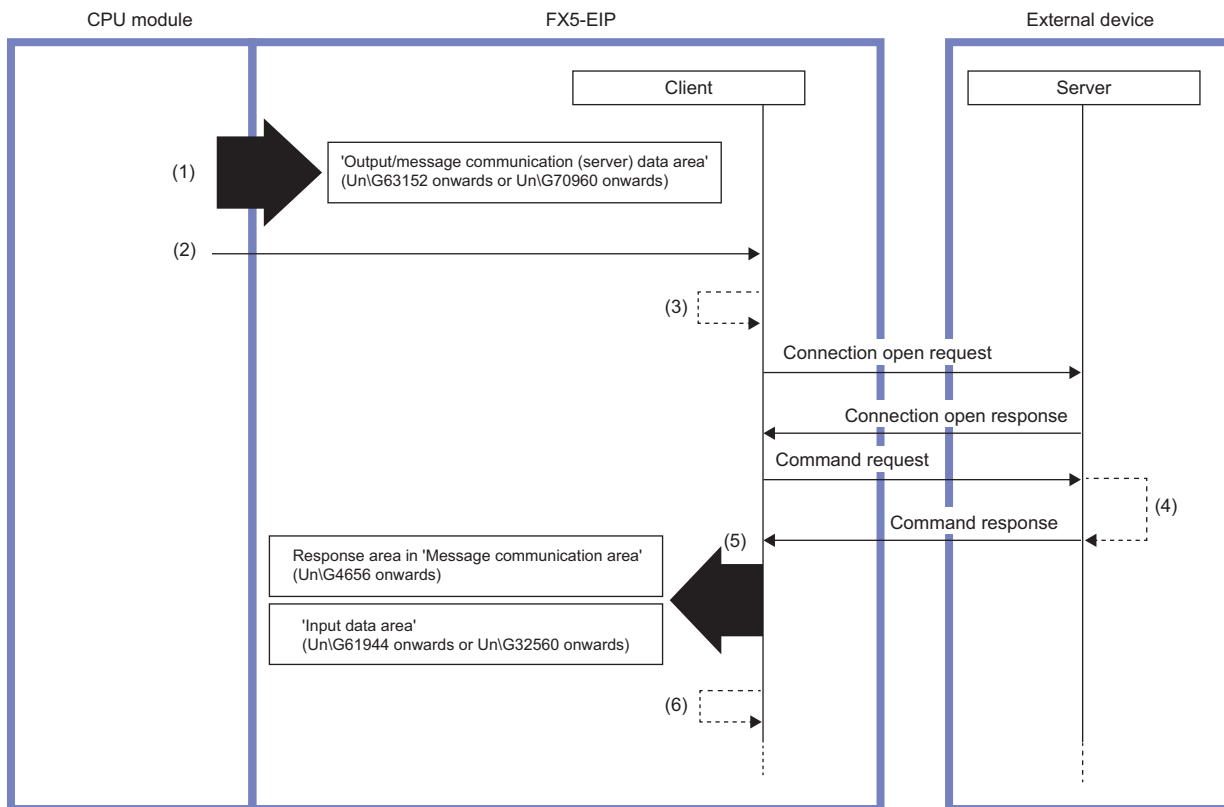
Type		Description
Client	Read	Transmits a Read request to the tag of the external device, and reads external device data in the 'Input data area' (Un\G16944 onwards or Un\G32560 onwards).
	Write	Transmits a Write request to the tag of the external device, and writes data in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards) to the external device.

Class3 instance communications (client)

Establishes a connection between the FX5-EIP and the external device (server) to perform message communication. A command request set for the external device registered in "EtherNet/IP Configuration" is transmitted as Class3 communications parameters for the FX5-EIP. The command response from the external device is stored in the following response area.

- 'Response area in message communication area' (Un\G4816 onwards) (When the connection number is 1)
- 'Input data area' (Un\G16944 onward or Un\G32560 onwards)

The following figure shows the flow of client function for Class3 instance communications.



- (1) Set request data by a program.
- (2) Turn on b0 (execution request) of 'Message communication execution request' (Un\G4496 onwards).
- (3) Turn on b1 (execution request acceptance) of 'Message communication execution request' (Un\G4496 onwards).
- (4) Command processing execution
- (5) Store the response data in the buffer memory.
- (6) Turn on b2 (execution completion) of 'Message communication execution request' (Un\G4496 onwards).

Message communications request data preparation

The following describes the setting procedure necessary for transmitting message communications command requests.

1. In "EtherNet/IP Configuration", set Class3 communications parameters. (Page 107 EtherNet/IP Configuration window)
2. If necessary, set the following in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards).

Match the connection number in the output/message communication (server) data area with the connection number in the Class3 communications parameters set in "EtherNet/IP Configuration".

Name	Address (when connection number is 1)	Description
Request data	Un\G63152 onwards or Un\G70960 onwards	Request data to be transmitted to the external device. (Specified in a little-endian format byte string) A valid area is judged based on the data size set in the Class3 communications parameters. Since the data size is set in byte units, an area with the data size ÷ 2 (rounded up) is valid. This setting is not required when 0 is set for Data Size.

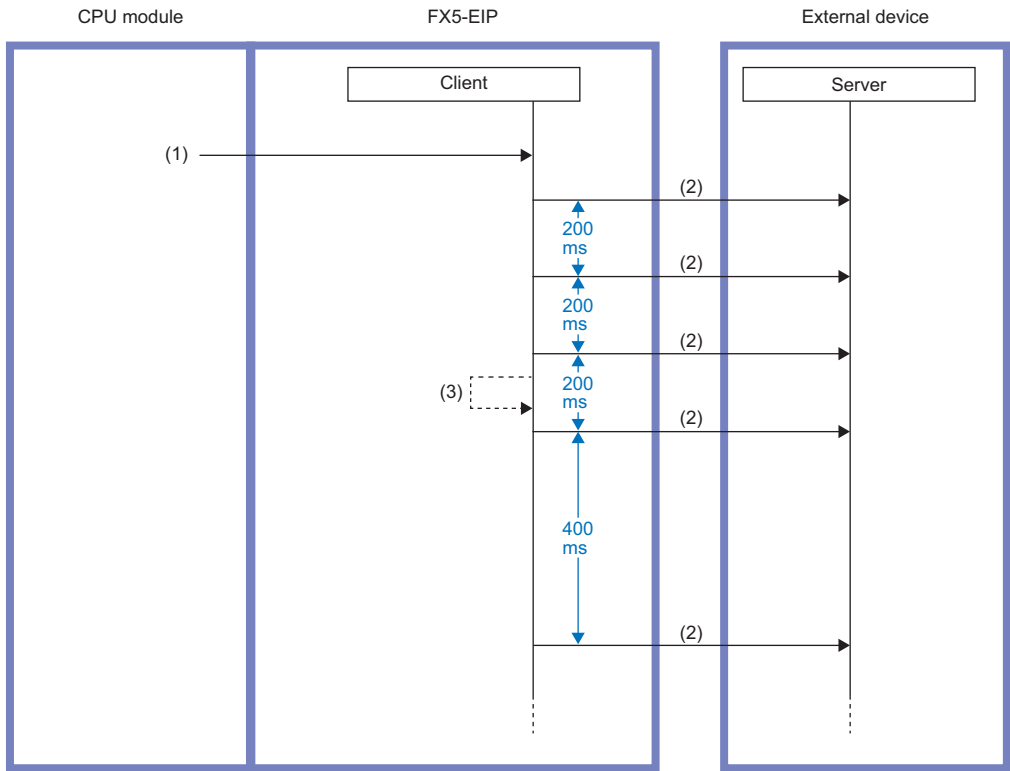
Data transmitting/receiving

For details on transmitting and receiving data for Class3 message communications, refer to the following.

☞ Page 68 Transmitting/receiving data for the message communication function (client)

Option

When Cyclic is selected for the trigger specification, changing the value of 'RPI of request area in message communication area' (Un\G4661) (when the connection number is 1) or i_uRPI (RPI) of the module function block can change the transmission interval from the value set in the Class3 communication parameters.



- (1) Turn on b0 of 'Message communication execution request' (Un\G4496 onwards).
- (2) Command request
- (3) Change RPI from 200ms to 400ms.

Precautions

The area where Class3 instance communications can be used is limited to the connection area set in the parameters for Class3 communications in "EtherNet/IP Configuration" (request areas where the value of 'Communication type specification' (Un\G4656) is 0002H (Class3 communications)).

If a request is executed by using a request area not available for Class3 communications, an error (error code 0004H) is stored in 'Result storage area' (Un\G4816) in the corresponding response area.

Buffer memory operation

For details on the buffer memory operation, refer to the following.

☞ Page 127 For Class3 instance communications (client)

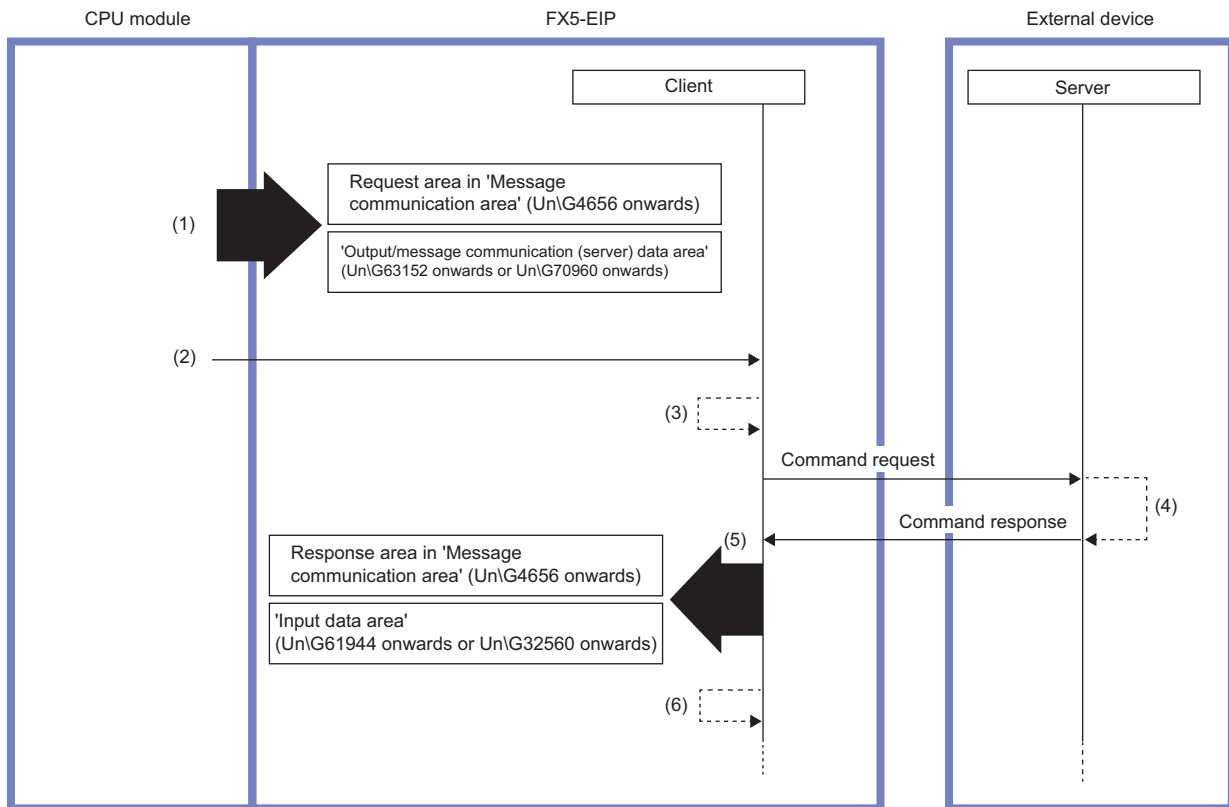
UCMM instance communications (client)

Without establishing a connection between the FX5-EIP and the external device (server), message communications are performed at any timing.

Once per request, communications are performed with the external device without opening a connection.

The set command request is transmitted to the external device set in the request area of 'Message communication area' (Un\G4656 onwards) of the FX5-EIP. The command response from the external device is stored in the following response area.

- 'Response area in message communication area' (Un\G4816 onwards) (When the connection number is 1)
- 'Input data area' (Un\G16944 onward or Un\G32560 onwards)



- (1) Set request data by a program.
- (2) Turn on b0 (execution request) of 'Message communication execution request' (Un\G4496 onwards).
- (3) Turn on b1 (execution request acceptance) of 'Message communication execution request' (Un\G4496 onwards).
- (4) Command processing execution
- (5) Store the response data in the buffer memory.
- (6) Turn on b2 (execution completion) of 'Message communication execution request' (Un\G4496 onwards).

Message communications request data preparation

The following describes the setting procedure necessary for transmitting message communications command requests. Any value can be set for a command request. However, if a command request not supported by the external device is transmitted, an error response is returned.

1. Check the manual for the external device operating as the server, and check the following details related to the service to be used.
 - The service code of the service to be used
 - The class ID of the object to which the service to be used belongs
 - The instance ID and attribute ID of the instance attribute to which the service to be used belongs
 - The size of the request data and the request data to be transmitted to the service to be used
2. Based on the result of step 1, set the following.

Item	Name	Address ^{*2} (when connection number is 1)	Setting details
Required Settings	Output/message communication (server) data size	Un\G432	Size of request data (bytes) ^{*1} Set 0 if the setting is not required.
	Communication type specification	Un\G4656	0001H: UCMM communications (fixed)
	Communication method specification	Un\G4657	0001H: Instance communications
	Service	Un\G4658	Service code ^{*1}
	Target IP address	Un\G4659	IP address of the external device (lower)
		Un\G4660	IP address of the external device (upper)
	Class	Un\G4670	Class ID ^{*1}
	Instance	Un\G4671	Instance ID ^{*1}
	Attribute	Un\G4672	Attribute ID ^{*1}
Option settings	Output/message communication (server) data area	Un\G63152 onwards or Un\G70960 onwards	Request data (specified in a little-endian format byte string) ^{*1} The setting is not required if not necessary.
	RPI	Un\G4661	00C8H to EA60H (200ms to 60000ms) Set any transmitting interval.
	Trigger Type	Un\G4663	0000H: Application Trigger (default) 0010H: Cyclic When Cyclic is set, data is periodically transmitted at the interval set for RPI.

*1 For a value to be set, refer to the manual for the external device.

*2 Each address in the column belongs to the first area. To use an area other than the first area, add $192 \times (N-1)$ to the address value of the first area. The value to be added for the output/message communication (server) data area is as follows.
 For 64 connections, add $722 \times (N-1)$ to the address value of the first area.
 For 128 connections, add $300 \times (N-1)$ to the address value of the first area.

Precautions

Before setting, turn on 'EtherNet/IP communication start request' (Un\G272) and check that 'EtherNet/IP communication start status' (Un\G273) is set to 1 (Operating). When EtherNet/IP communication starts, the values set in "Required Settings" above will be cleared to 0.

Data transmitting/receiving

For details on transmitting and receiving data for UCMM message communications, refer to the following.

 Page 68 Transmitting/receiving data for the message communication function (client)

Precautions

The area where UCMM message communication can be used is limited to areas where the Class1 communication parameters, Class3 communication parameters, and message communication (server function) tag communication parameters are not set in "EtherNet/IP Configuration" (request areas where the value of 'Communication type specification' (Un\G4656) (when the connection number is 1) is 0001H (UCMM communication) as the initial value).

If a request is executed by using a request area not available for UCMM communications, an error (error code 0005H (unavailable communication method specified)) is stored in 'Result storage area' (Un\G4816) in the corresponding response area.

UCMM message communication does not establish a connection, but each execution uses a parameter setting area for one connection.

Buffer memory operation

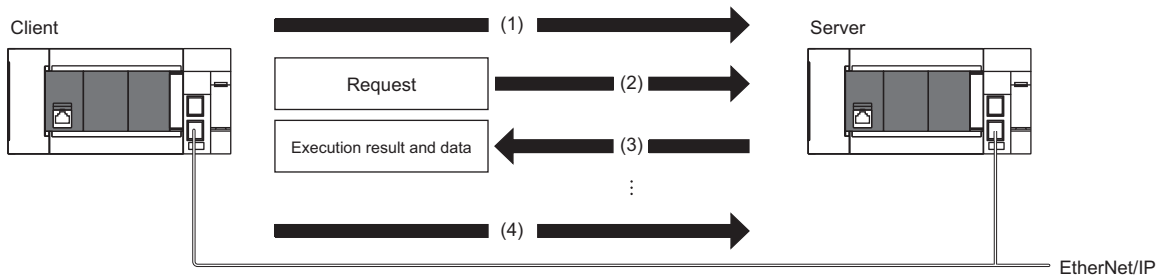
For details on the buffer memory operation, refer to the following.

 Page 129 For UCMM instance communications (client)

Class3 tag communications (client)

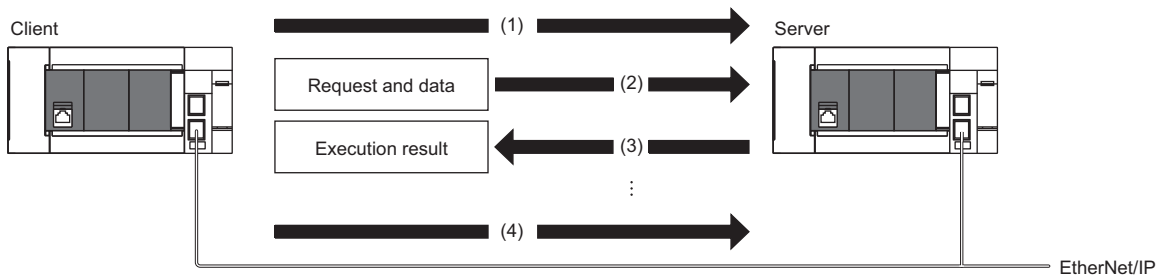
Establishes a connection and read/write data.

• Read request



- (1) Connection open
- (2) Read request
- (3) Read response
- (4) Connection close

• Write request



- (1) Connection open
- (2) Write request
- (3) Write response
- (4) Connection close

Tag communications request data preparation

The following describes the setting procedures necessary for executing tag communications.

1. In "EtherNet/IP Configuration", set Class3 communications parameters. (Page 107 EtherNet/IP Configuration window)
2. For a write request, set the following in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards) (when the connection number is 1).

Name	Address (when connection number is 1)	Description
Output/message communication (server) data area	Un\G63152 onwards or Un\G70960 onwards	Request data to be transmitted to the external device. (Specified in a little-endian format byte string) A valid area is judged based on the data size set in the Class3 communications parameters. For the data size, the area of size (Size) × (Data Type) becomes valid. (1 (word) when Data Type is [INT], and 2 (word) when Data Type is [DINT]) This setting is not required when service is set to read.

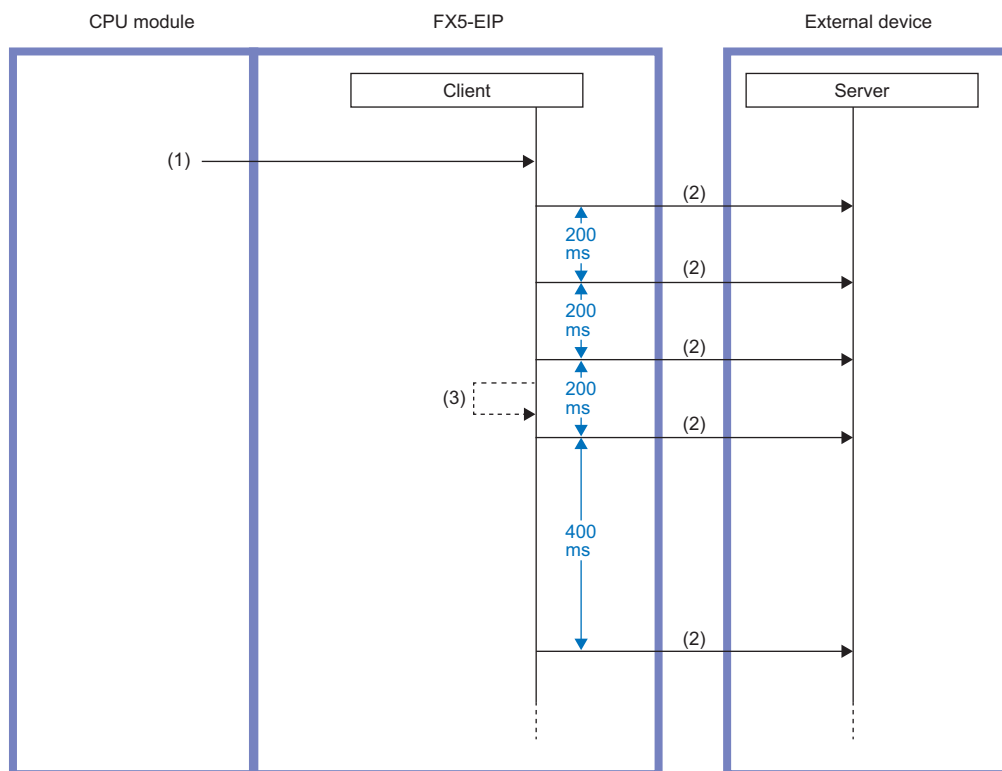
Data transmitting/receiving

For details on transmitting and receiving data for Class3 tag communications, refer to the following.

Page 68 Transmitting/receiving data for the message communication function (client)

Option

When Cyclic is selected for the trigger specification, changing the value of 'RPI' (Un\G4661) (when the connection number is 1) or i_uRPI (RPI) of the module function block can change the transmission interval from the value set in the Class3 communication parameters.



- (1) Turn on b0 of 'Message communication execution request' (Un\G4496 onwards).
(2) Command request
(3) Change RPI from 200ms to 400ms.

Precautions

The area where Class3 tag communication can be used is limited to the connection area set in the parameters for Class3 communication in "EtherNet/IP Configuration" (request areas where the value of 'Communication type specification' (Un\G4656) is 0002H (Class3 communication)).

If a request is executed by using a request area not available for Class3 communications, an error (error code 0004H) is stored in 'Result storage area' (Un\G4816) in the corresponding response area.

Buffer memory operation

■For a Read request

For details on the buffer memory operation, refer to the following.

☞ Page 127 For Class3 tag communications (client) (Read)

■For a Write request

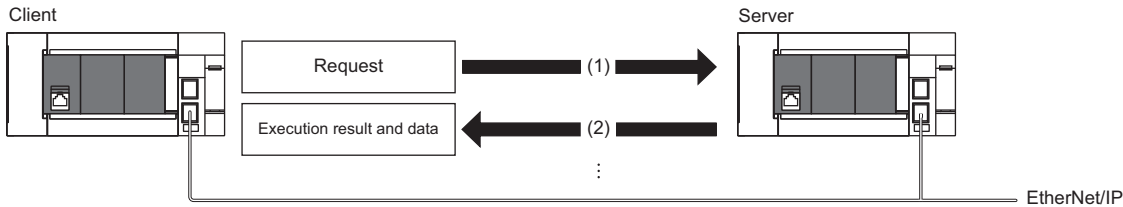
For details on the buffer memory operation, refer to the following.

☞ Page 128 For Class3 tag communications (client) (Write)

UCMM tag communications (client)

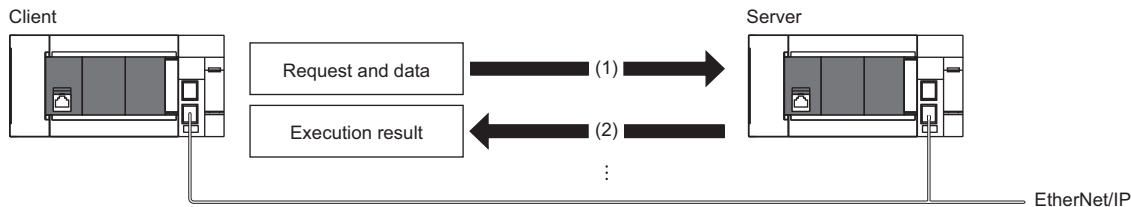
Without establishing a connection, data is read/written.
The data set in 'Request area in message communication area' (Un\G4656 onward) is transmitted as a command request, and the response data from the external device is stored in the response area of 'Response area in message communication area' (Un\G4816 onwards). (When connection number is 1)

• Read request



- (1) Read request
- (2) Read response

• Write request



- (1) Write request
- (2) Write response

Tag communications request data preparation

The following describes the setting procedures necessary for executing tag communications.

1. Check the tag description to be used for tag communications (tag name and size of the tag registered in the external device).
2. Based on the result of step 1, set the following.

Item	Name	Address* ² (when connection number is 1)	Setting details
Required Settings	Output/message communication (server) data size	Un\G432	Specify the size as the number of tag elements for Read or Write.
	Communication type specification	Un\G4656	0001H: UCMM communications (fixed)
	Communication method specification	Un\G4657	0002H: Tag communications
	Service	Un\G4658	<ul style="list-style-type: none"> • 124CH: UCMM/Class3 Read Originator (for Read request) • 124DH: UCMM/Class3 Write Originator (for Write request)
	Target IP address	Un\G4659	IP address of the external device (lower)
		Un\G4660	IP address of the external device (upper)
	Data Type	Un\G4669	<ul style="list-style-type: none"> • 00C3H: INT (signed 16-bit data) • 00C4H: DINT (signed 32-bit data)
	Tag Name	Un\G4673 onwards	Specify the tag name of the external device to read. (Specify the number of characters from 1 to 255.)
Option settings	Output/message communication (server) data area	Un\G63152 or Un\G70960	Write data for Write request An area of the size (Data Size) × (Data Type type) becomes valid. (1 (word) when Data Type is [INT], and 2 (word) when Data Type is [DINT]) When UCMM/Class3 Read Originator is set for Service, the setting is not required.
	RPI	Un\G4661	00C8H to EA60H (200ms to 60000ms) Set any transmitting interval.
	Trigger Type	Un\G4663	0000H: Application Trigger (default) 0010H: Cyclic When Cyclic is set, data is periodically transmitted at the interval set for RPI.
	Path Segment specification (Segment Size)* ¹	Un\G4664	Path Segment size (0 to 1 words)
	Path Segment specification (Path Segment)* ¹	Un\G4665 onwards	Bits 0 to 3: Port number Bits 8 to 15: Link address (slot number)

*1 For details on Path Segment, refer to the following.

☞ Page 248 Message communication request/response area

*2 Each address in the column belongs to the first area. To use an area other than the first area, add $192 \times (N-1)$ to the address value of the first area. The value to be added for the output/message communication (server) data area is as follows.

For 64 connections, add $722 \times (N-1)$ to the address value of the first area.

For 128 connections, add $300 \times (N-1)$ to the address value of the first area.

Data transmitting/receiving

For details on transmitting and receiving data for UCMM tag communications, refer to the following.

☞ Page 68 Transmitting/receiving data for the message communication function (client)

Precautions

The area where UCMM tag communication can be used is limited to areas where the Class1 communication parameters, Class3 communication parameters, and message communication (server function) tag communication parameters are not set in "EtherNet/IP Configuration" (request areas where the value of 'Communication type specification' (Un\G4656) (when the connection number is 1) is 0001H (UCMM communication) as the initial value).

If a request is executed by using a request area not available for UCMM communications, an error (error code 0005H (UCMM communication unavailable)) is stored in 'Result storage area' (Un\G4816) in the corresponding response area.

Buffer memory operation

■For a Read request

For details on the buffer memory operation, refer to the following.

☞ Page 130 For UCMM tag communications (client) (Read)

■For a Write request

For details on the buffer memory operation, refer to the following.

☞ Page 131 For UCMM tag communications (client) (Write)

Transmitting/receiving data for the message communication function (client)

The message communication function (client) has the following two methods.

- Transmitting/receiving data for message communications using the buffer memory ( Page 68 Transmitting/receiving data for message communications using the buffer memory)
- Transmitting/receiving data for message communications using module function blocks ( Page 71 Transmitting/receiving data for message communications using module FBs)

Transmitting/receiving data for message communications using the buffer memory

Data is transmitted/received for message communications using one of the areas from 'Message communication area' (Un\G4656 onwards). ( Page 248 Message communication request/response area)

The area to be used differs depending on the communication type to be executed.

The area to be used for 'Message communication area' (Un\G4656 onwards) can be determined using the following method.

Communication type	Method
Class3	After the required parameters such as the tag name, class, instance, and attribute ID for Class3 communications to be used are set in "EtherNet/IP Configuration", 'Message communication area' (Un\G4656 onwards) with the same number as a connection number for which the Class3 communication parameters are set is secured.
UCMM	An area in 'Message communication area' (Un\G4656 onwards) with the same number as a connection number for which the Class1 communication parameters, Class3 communications parameters, and message communication (server) tag communication parameters are not set in "EtherNet/IP Configuration" can be used. However, it is recommended not to use the number that was used as a module function block request number in 'Message communication area' (Un\G4656 onwards).

■Transmission procedure

Message communications for the external device are executed according to the following procedures. *1

- *1 For areas described hereafter, the first area is used as an example. To use an area other than the first area, add $192 \times (N-1)$ to the address value of the first area. The value to be added for the output/message communication (server) data area is as follows.
For 64 connections, add $722 \times (N-1)$ to the address value of the first area.
For 128 connections, add $300 \times (N-1)$ to the address value of the first area.

1. 'EtherNet/IP communication start status' (Un\G273) becomes 1 (Operating) at the following timing, and EtherNet/IP communication starts.
 - A value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).
 - When the EtherNet/IP communication automatic start function is enabled, the CPU module changes from STOP to RUN.
2. Check 'Communication type specification' (Un\G4656) in the request area of the message communication area.
3. When the value of 'Communication type specification' (Un\G4656) is 0001H (UCMM communications), set 'Communication method specification' (Un\G4657) to 'Tag Name' (Un\G4673 onwards). When the value of 'Communication type specification' (Un\G4656) is 0002H (Class3 communications), the setting is not required.
4. Set 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards) as necessary. Set this mainly when transmitting a write request to the external device, such as writing to the tag and rewriting parameters by using Set_Attribute_Single.
5. Turn on bit 0 (execution request) of 'Message communication execution request' (Un\G4496).

■Receive procedure

1. The result is stored in the response area (Un\G4816 onwards) of the message communication area, and bit 2 (execution completion) of 'Message communication execution request' (Un\G4496) turns on. When response data is present, the received data is stored in 'Input data area' (Un\G16944 onwards), and the data size is stored in 'Input data size' (Un\G304 onwards).
2. By turning bit 0 (execution request) of 'Message communication execution request' (Un\G4496) off, bit 2 (execution completion) of 'Message communication execution request' (Un\G4496) will also be turned off.

The system operates according to 'Trigger specification' (Un\G4663) until bit 0 (execution request) of 'Message communication execution request' (Un\G4496) is turned off.

If the execution request is turned on again before bit 2 (execution completion) of 'Message communication execution request' (Un\G4496 onwards) turns off, the turning off of the execution request may not be recognized.

■Precautions

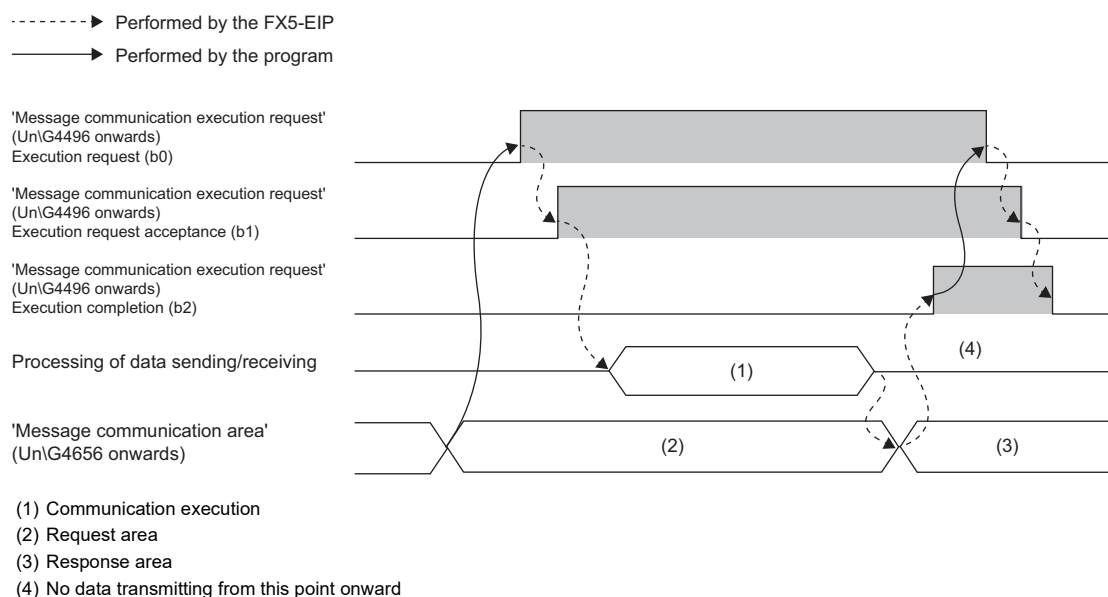
- Areas where Class1 communication parameters and Class3 communication parameters are set in "EtherNet/IP Configuration" become dedicated to the communication type. For areas where Class1 communication parameters and Class3 communication parameters are not set, the initial value of 'Communication type specification' (Un\G4656) is set to 0001H (UCMM communications). Therefore, check that the areas to be used that were determined above do not have any problems.
- If the value of 'Communication type specification' (Un\G4656) is rewritten by a program, the communication request may fail and an error may occur. Ensure that the value is not overwritten.
- If data transmitting/receiving fails, or if an error response is sent from the external device at the time of reception, an error code is stored set in 'Result storage area' (Un\G4816) of the message communication response area.

■Timing chart

The following figures show operations from 'Message communication execution request' (Un\G4496 onwards) turning on to turning off according to the setting details of 'Trigger specification' (Un\G4663).

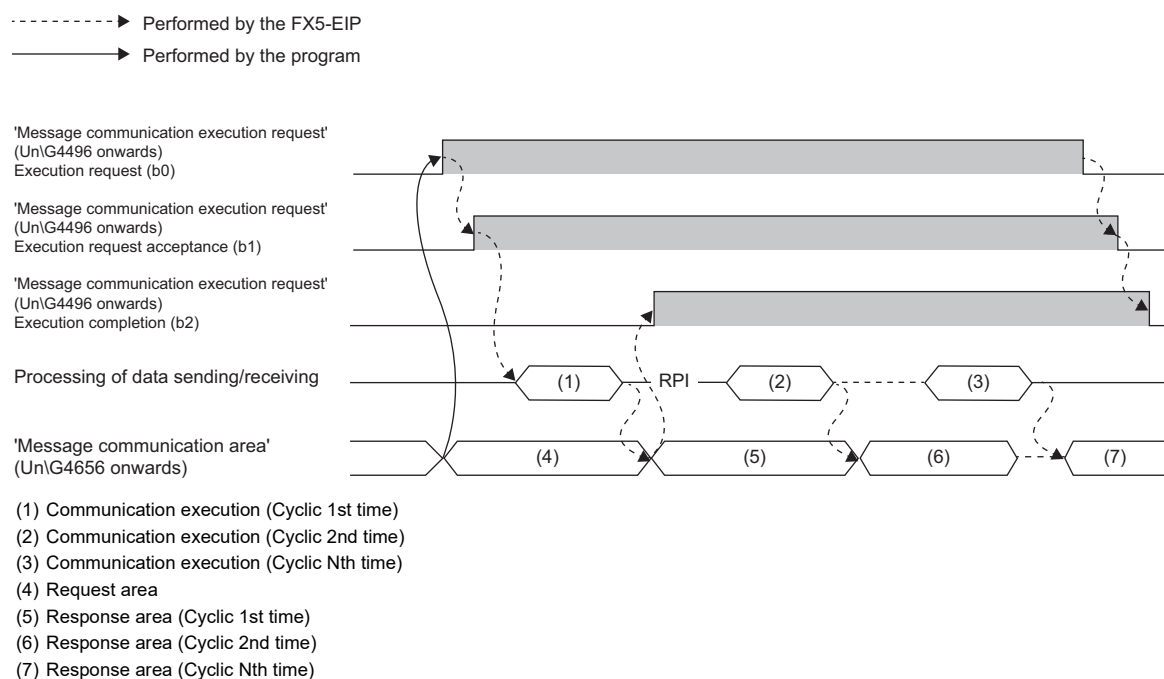
- When the trigger specification is Application Trigger

A message is transmitted only once for one request.



- When the trigger specification is Cyclic

Messages are transmitted periodically at the interval set in 'RPI' (Un\G4661), and every time a message is received, the result is stored in 'Response area in message communication area' (Un\G4816 onwards). (Every time the result is stored, the value of 'Execution completion count' (Un\G4823 onwards) is increased.)



The following describes the operation when the trigger specification is changed during the period from the turning on of bit 1 (execution request acceptance) of execution request acceptance until the turning off of bit 0 (execution request) of execution request in 'Message communication execution request' (Un\G4496 onwards). (Including during the time of periodic transmission by Cyclic)

- Even when the trigger specification is changed from Application Trigger to Cyclic, periodic transmission is not performed. To enable periodic transmission, turn off bit 0 (execution request) of execution request in 'Message communication execution request' (Un\G4496 onwards), then check that bit 1 (execution request acceptance) of execution request acceptance and bit 2 (execution completion) execution completion in 'Message communication execution request' (Un\G4496 onwards) are off. After that, turn on bit 0 (execution request) of execution request in 'Message communication execution request' (Un\G4496 onwards).
- When the trigger specification is changed from Cyclic to Application Trigger, periodical transmission is performed the RPI time after transmission immediately before the change of the trigger specification, and then periodic transmission stops. To execute periodic transmission again, refer to the case where the trigger specification is changed from Application Trigger to Cyclic.

Transmitting/receiving data for message communications using module FBs

Execute data transmitting/receiving for message communications using module function blocks.

Determine the module function blocks to be used based on the communication type for executing message communications, communications method, and service to be used (when the communication method is tag communications).

For details on module function blocks, refer to the following.

■ MELSEC iQ-F FX5 Ethernet, EtherNet/IP, CC-Link IE Function Block Reference

Communication type	Communication method	Service	Module function block
UCMM	Instance communications	—	M+FX5-EIP_UCMMOriginator_MessageSend
	Tag communications	Read	M+FX5-EIP_UCMMOriginator_ReadTagData
		Write	M+FX5-EIP_UCMMOriginator_WriteTagData
Class3	Instance communications	—	M+FX5-EIP_Class3Originator_MessageSend
	Tag communications	Read	M+FX5-EIP_Class3Originator_ReadTagData
		Write	M+FX5-EIP_Class3Originator_Write TagData

■ Request number

Determine the request number as follows according to the communication type to be executed.

Communication type	Method
Class3	After the required parameters such as the tag name, class, instance, and attribute ID for Class3 communication to be used are set as parameters for Class3 communication in "EtherNet/IP Configuration", the connection number for which these Class3 communication parameters were set becomes a request number.
UCMM	The same number as a connection number for which the Class1 communication parameters, Class3 communication parameters, and message communication (server function) tag communication parameters are not set in "EtherNet/IP Configuration" can be used as a request number. However, request numbers being used by other module function blocks and message communication area numbers being used for transmitting and receiving message communication using buffer memory (Page 68 Transmitting/receiving data for message communications using the buffer memory) cannot be used. Ensure that no duplicates exist. (Identical numbers can be used as long as they are not requested at the same time. In that case, however, mutual exclusion is required. Therefore, managing request numbers so that they are unique is recommended.)

■Transmission procedure

1. Set all the input arguments for the module function block to be used.
2. For message communications or tag communications (write) for which request data must be set, set required data to the request data storage device or write data storage device.
 - When the communication type is UCMM: Set data of the size specified by the input argument.
 - When the communication type is Class3: Set data as big as the size of data set as Class3 communications parameters.
3. Turn on i_bEN (execution command) of the module function block.

Point

If an error occurs because an incorrect module function block is used, the module function block is transmitted incorrectly, or transmitting failed, o_bErr (Error completion) of the module function block turns on and an error code is stored in o_uErrId (Error code).  MELSEC iQ-F FX5 Ethernet, EtherNet/IP, CC-Link IE Function Block Reference

■Receive procedure

1. When o_bENO (Execution status) of the module function block turns on, the result is stored in the output argument and public variable.
2. When o_bOK (Normal completion) of the module function block turns on, data of the size equal to the data size is stored in the response data storage device for message communications and in the read data storage device for tag communications.

Point

If reception fails or an error response is transmitted from the external device at the time of reception, o_bErr (Error completion) of the module function block turns on and an error code is stored in o_uErrId (Error code). ( Page 182 Module error)

■Operation

The following table lists the operations from i_bEN (Execution command) of the module function block turning on to turning off according to the setting details of i_uTrigger (Trigger specification).

Trigger type	Operation
Application Trigger	Every time the module function block is executed, the received data is stored in the output argument and public variable. For Application Trigger, a request is executed only once. Therefore, when the module function block is executed after o_bOK (Normal completion) turns on, the same data is stored continuously.
Cyclic	A request is transmitted periodically at the set RPI interval. Every time pbo_udRequestCompleteCount (Execution completion count) of the module function block is updated, the result to be stored in the output argument and public variable is updated.

Point

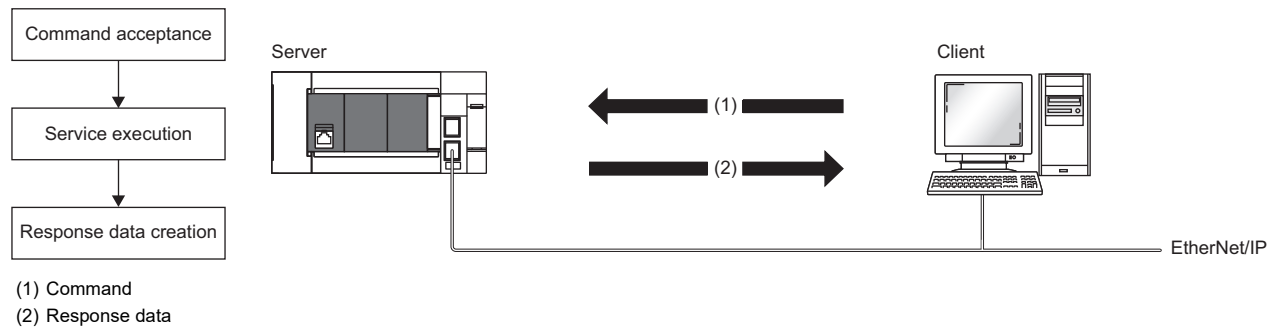
The following describes the operations when the trigger specification is changed during the time between i_bEN (Execution command) of the module function block turning on and turning off.

- When the trigger specification is changed from Application Trigger to Cyclic, periodic transmission is not performed. To enable periodic transmission, turn off i_bEN (Execution command) of the module function block once, check that o_bENO (Execution status) is turned off, and turn on i_bEN (Execution command) again.
- When the trigger specification is changed from Cyclic to Application Trigger, periodical transmission is performed the RPI time after transmission immediately before the change of the trigger specification, and then periodic transmission stops. To execute periodic transmission again, refer to the case where the trigger specification is changed from Application Trigger to Cyclic.

4.4 Message Communication Function (Server)

Function overview

This function executes the service specified by a command request transmitted by the client and returns a response.



The available functions include the instance communications server function for accepting a command request transmitted from a client and the tag communications server function for accepting a Read/Write request for data for the tag set to the server.

Class3 (connected) and UCMM (unconnected) are supported.

The message communication function (server) has the following communication methods.

Type	Communication method	Connection	Description
Instance communications	Class3 instance communications	Available	Establishes a connection between the FX5-EIP and the external device (client), processes command requests received from the client, and transmits response data.
	UCMM instance communications	Not available	Processes command requests received from the client and transmits response data without establishing a connection between the FX5-EIP and the external device (client).
Tag communications	Class3 tag communications	Available	Establishes a connection between the FX5-EIP and the external device (client) to read and write data to the set tags.
	UCMM tag communications	Not available	Reads and writes data to the set tags without establishing a connection between the FX5-EIP and the external device (client).

Instance communications

The services that the FX5-EIP can process vary depending on the class ID specified by a command request for the message communication support command. For details on the services available for each class ID, refer to the following.

📖 Page 254 Details of Message Communication Support Command

When the FX5-EIP operates as a server, it automatically processes the command when receiving a command request from the external device and returns a command response to the external device. No special setting and operation are required.

Tag communications

The available functions include the instance communications server function by which the FX5-EIP processes a request for the service, and the tag communications server function for processing Read/Write for data for the tag set to the FX5-EIP.

To use tag communications, a tag must be registered in "EtherNet/IP Configuration".

When registering a tag in the FX5-EIP, existing tag names cannot be used.*1*2

*1 Tag names are not case-sensitive.

*2 Tag names used for Class1 tag communications are treated separately. Therefore, the same name can be used as a tag in Class1 tag communications. However, in such a case, read/write message communications are not possible for that tag.

■Operation when a command is accepted

When a Read/Write request is received from the client for the tag of the own station, and a tag with the same name as the tag name set to the own station exists, read or write is performed on the buffer memory assigned to that tag in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards).

1. Start EtherNet/IP communication.

When 'EtherNet/IP communication start status' (Un\G273) becomes "1: Operating" at the following timing, start EtherNet/IP communication.

- The user sets a value other than 0 for "EtherNet/IP communication start request (Un\G272)".
- When the EtherNet/IP communication automatic start function is enabled, initialization after power-on is completed.

2. Transmit a command request from the client.

■Buffer memory area assigned to a tag

For a tag name registered as a Class3/UCMM tag in "EtherNet/IP Configuration", the buffer memory area to be assigned changes according to the set connection number (1 to 128).

The following table lists the buffer memory areas corresponding to the connection numbers set for the tag name.

Connection	Buffer memory	
	When 64 connections are used*1	When 128 connections are used*2
No.1	Un\G16944	Un\G32560
No.2	Un\G17666	Un\G32860
⋮	⋮	⋮
No.64	Un\G62430	Un\G51460
⋮	—	⋮
No.128	—	Un\G70660

*1 The buffer memory address for connection number n can be calculated by $16944 + (n-1) \times 722$.

*2 The buffer memory address for connection number n can be calculated by $32560 + (n-1) \times 300$.

■Read/Write request size

A Read/Write request size can be calculated by (Data Type) × (Data Size) of a tag.

Item	Description
Data Type	<ul style="list-style-type: none">• INT: 1 word• DINT: 2 words
Data Size	Size of request data from the client



If the Read/Write request size exceeds the data size of the tag registered as a Class3/UCMM tag, without executing Read/Write, an abnormal response is returned to the client.

■Read/Write execution

The following table lists the operations when a Read/Write request is received.

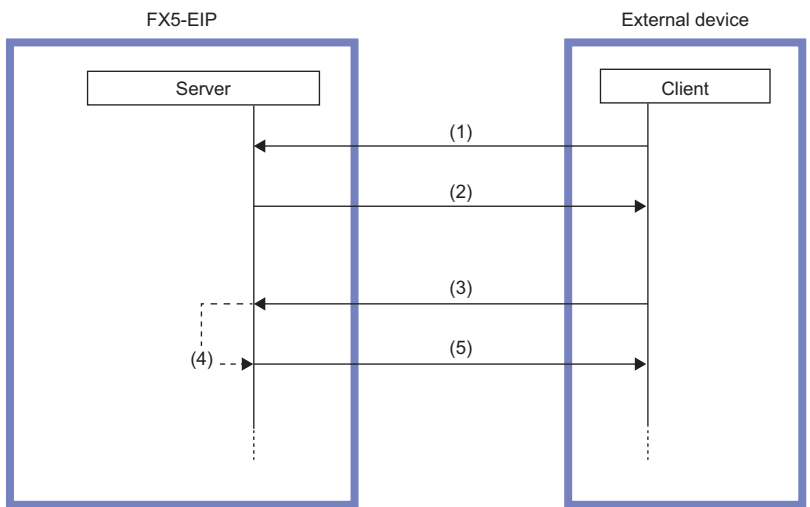
Type	Description
Read	When a Read request is received from the external device (client), transmits data of the requested size, starting from the start address corresponding to each connection number in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards), to the client.
Write	When a Write request is received from the external device (client), writes data of the requested size, starting from the start address corresponding to each connection number in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards).



If the Write request size is smaller than the data size of the tag registered as the Class3/UCMM tag, the data contained in the area where Write was not performed upon receiving a response will not be altered.

Class3 instance communications (server)

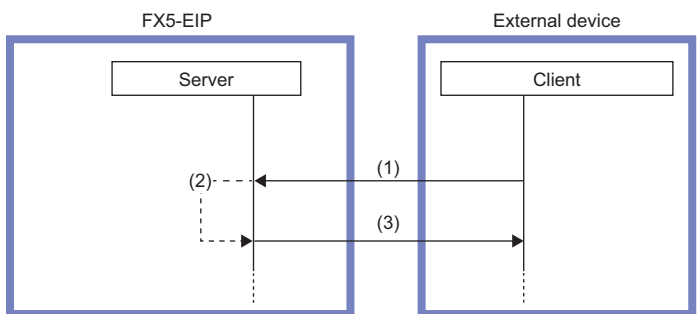
After a connection open request from the client is accepted, a command request accepted from the client is processed and response data is transmitted.



- (1) Connection open request
- (2) Connection open response (normal)
- (3) Command request
- (4) Command processing execution
- (5) Command response

UCMM instance communications (server)

Processes command requests received from the client and transmits response data without establishing a connection between the FX5-EIP and the external device.

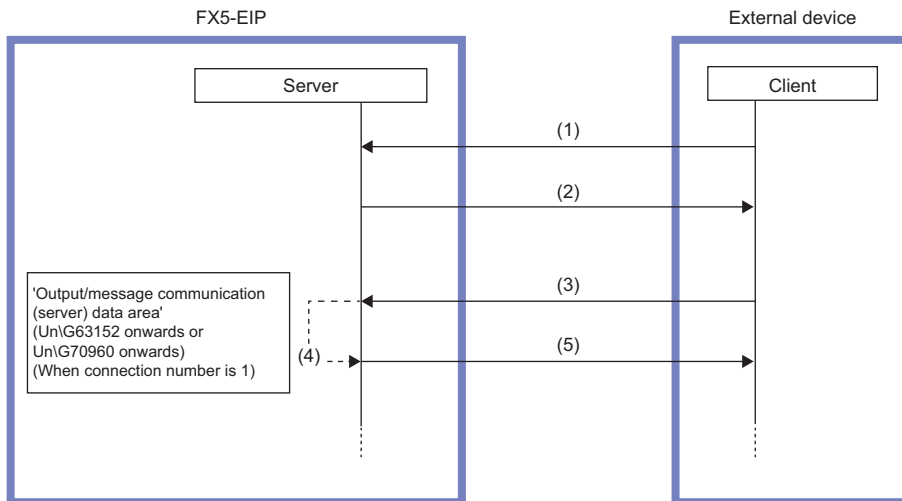


- (1) Command request
- (2) Command processing execution
- (3) Command response

Class3 tag communications (server)

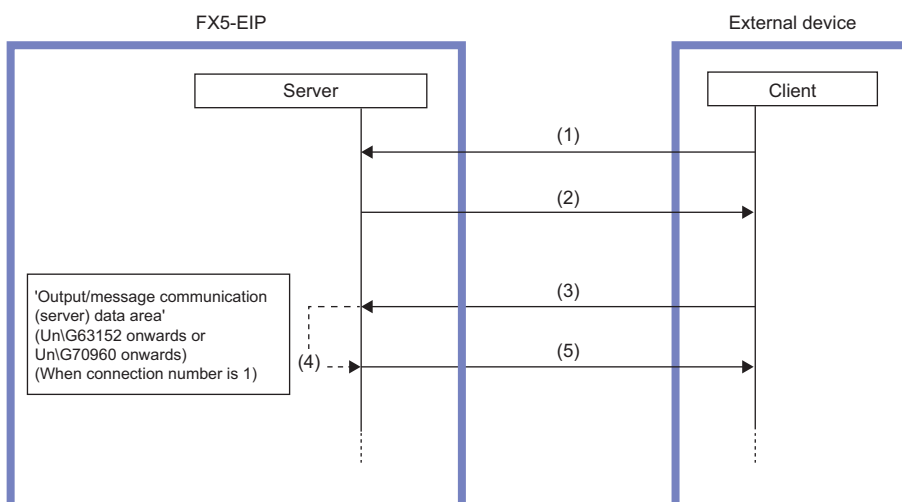
Accepts connection open request and Read/Write request from the client and processes data for the tag set to the FX5-EIP after establishing a connection.

Read request



- (1) Connection open request
- (2) Connection open response (normal)
- (3) Read request
- (4) Data read
- (5) Read response

Write request



- (1) Connection open request
- (2) Connection open response (normal)
- (3) Write request
- (4) Data write
- (5) Write response

Buffer memory operation

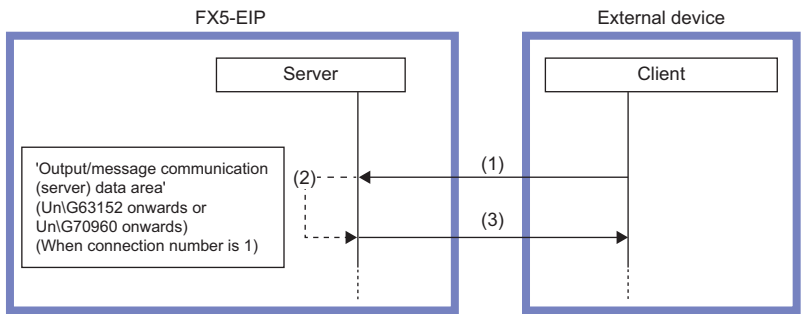
For details on the buffer memory operation, refer to the following.

☞ Page 132 For Class3/UCMM tag communications (server)

UCMM tag communications (server)

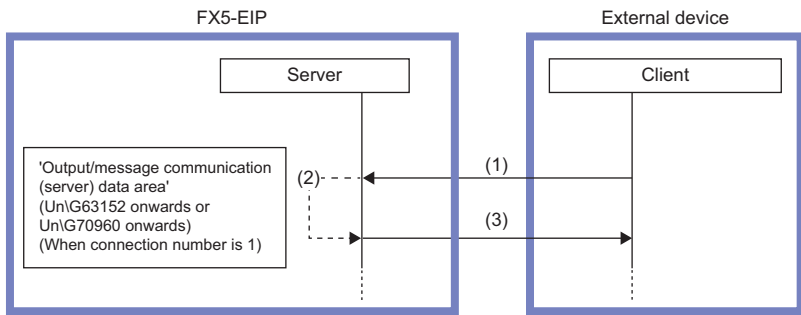
Accepts a Read/Write request from the client and processes data processed for the tag set to the FX5-EIP without establishing a connection.

Read request



- (1) Read request
- (2) Data read
- (3) Read response

Write request



- (1) Write request
- (2) Data write
- (3) Write response

Buffer memory operation

For details on the buffer memory operation, refer to the following.

📖 Page 132 For Class3/UCMM tag communications (server)

4.5 Communication Status Setting Function at the Occurrence of a CPU Stop Error

This function sets whether to stop or continue EtherNet/IP communications when a stop error occurs on the CPU module in which the FX5-EIP is installed. This setting can be configured for each module. Therefore, EtherNet/IP communications can continue even if the CPU module with a stop error enters the STOP state.

Setting method

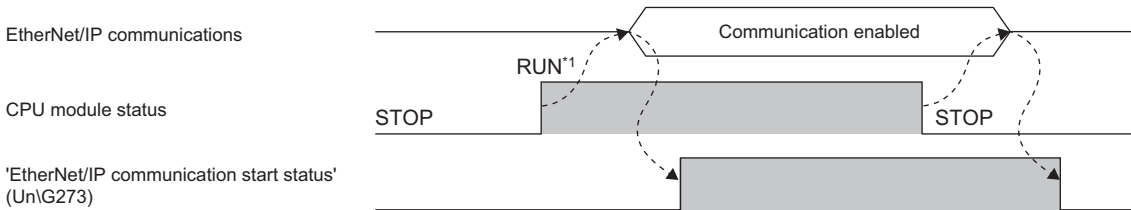
Set using the buffer memory of the FX5-EIP.

Address	Buffer memory	Reference
Un\G274	EtherNet/IP communication continuation specification request	Page 237 EtherNet/IP communication continuation specification request (Un\G274)

To stop EtherNet/IP communications when the CPU module changes from RUN to STOP, set 'EtherNet/IP communication continuation specification request' (Un\G274) to 0 (Stop).
To continue EtherNet/IP communications when the CPU module changes from RUN to STOP, set 'EtherNet/IP communication continuation specification request' (Un\G274) to 16 (Continue).

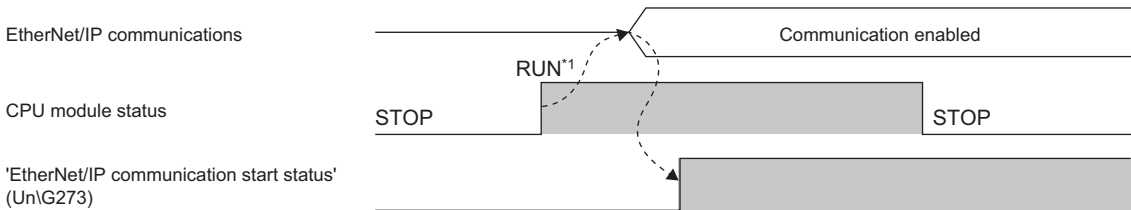
Timing chart

- To stop EtherNet/IP communication



*1 When the CPU module changes from STOP to RUN, EtherNet/IP communication starts.

- To continue EtherNet/IP communication



*1 When the CPU module changes from STOP to RUN, EtherNet/IP communication starts.

4.6 EtherNet/IP Communication Automatic Start Function

Function overview

To use this function, EtherNet/IP communication can start without using a program when the programmable controller is powered off and on or the CPU module changes from STOP to RUN.

To start EtherNet/IP communication without using this function, a program is required to set 'EtherNet/IP communication start request' (Un\G272) to a value other than 0 (start request).

Setting method

In the application setting of the engineering tool, set "Start" for "EtherNet/IP Auto-start Setting".

For details, refer to the following.

 Page 91 EtherNet/IP Setting

Operation

With this function enabled, when the CPU module changes from STOP to RUN, 16 (start request) is set to 'EtherNet/IP communication start request' (Un\G272) and communication starts automatically.

However, buffer memory operation changes depending on the value set to 'EtherNet/IP communication continuation specification request' (Un\G272).

The following table lists the relationship between each buffer memory area and EtherNet/IP communication automatic start status.

- When the CPU module is in the RUN state and the system is powered off and on

Before			After	
CPU module status	Status of "EtherNet/IP Auto-start Setting"	Status of 'EtherNet/IP communication continuation specification request' (Un\G274)	Status of 'EtherNet/IP communication start request' (Un\G272)	Status of 'EtherNet/IP data link continuation specification state' (Un\G275)
RUN state	Start	16 (continue)	16 (start request) is set.	1 (operating with the setting "continue") is set.
		0 (stop)	16 (start request) is set.	2 (operating with the setting "stop") is set.
	Not to start	—	The status does not change.	The status does not change.

- If the CPU module changes from STOP to RUN or RUN to STOP

Before				After	
CPU module status	Status of "EtherNet/IP Auto-start Setting"	Status of 'EtherNet/IP data link continuation specification state' (Un\G275)	Status of 'EtherNet/IP communication continuation specification request' (Un\G274)	Status of 'EtherNet/IP communication start request' (Un\G272)	Status of 'EtherNet/IP data link continuation specification state' (Un\G275)
STOP → RUN	Start	2 (operating with the setting "stop")	16 (continue)	16 (start request) is set.	1 (operating with the setting "continue") is set.
			0 (stop)	16 (start request) is set.	2 (operating with the setting "stop") is set.
		1 (operating with the setting "continue")	—	The status does not change.*2	The status does not change.
	Not to start	—	—	The status does not change.	—
RUN → STOP*1	—	2 (operating with the setting "stop")	—	0 (stop request) is set.	The status does not change.
		1 (operating with the setting "continue")	—	The status does not change. (Remains set to 16 (start request).)	The status does not change.

*1 This operation is performed when 'EtherNet/IP communication start request' (Un\G272) is set to 16 (Start request) and 'EtherNet/IP communication start status' (Un\G273) is set to 1 (Operating). If 'EtherNet/IP communication start status' (Un\G273) is set to any value other than 1 (Operating), the communication will not start and therefore will not be stopped.

*2 Since the operation does not stop when the CPU module changes from RUN to STOP, the communication continues unless 'EtherNet/IP communication start request' (Un\G272) is manually set to 0 (Stop request).
If the communication is manually stopped, setting Un\G272 to 16 (Start request) is required to restart the EtherNet/IP communication.

4.7 Assurance of input/output data

The data received from EtherNet/IP devices and the data transmitted to EtherNet/IP devices can be assured for each connection. The data assurance is enabled by setting the buffer memory and acquiring the input data and setting the output data using the following module function blocks.

- Class1 communication input data acquisition (Class1GetInputData)
- Class1 communication output data setting (Class1SetOutputData)
- UCMM tag communication tag data acquisition (UCMMOriginator_ReadTagData)
- UCMM tag communication tag data setting (UCMMOriginator_WriteTagData)
- Class3 tag communication tag data acquisition (Class3Originator_ReadTagData)
- Class3 tag communication tag data setting (Class3Originator_WriteTagData)
- UCMM instance communication message transmission (UCMMOriginator_MessageSend)
- Class3 instance communication message transmission (Class3Originator_MessageSend)

Setting procedure

1. Write "16: Assured" in 'Block assurance specification per connection' (Un\G232) while the module is not communicating with the EtherNet/IP communication device (when Un\G272 is "0: Stop request").
2. Set 'EtherNet/IP communication start request' (Un\G272) to "Other than 0: Start request" to start the communications with the EtherNet/IP device.
3. Acquire the receive data and set the transmitted data using the module function blocks by the program.

Precautions

- This function cannot be used together with the auto refresh processing.
- When using this function, set the scan time to be shorter than RPI. If the scan time is longer than RPI, transmit and receive data may be delayed.

4.8 Standard Ethernet communication functions

Connection With MELSOFT

For details on connecting with MELSOFT, refer to the following.

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

SLMP communication function

With the FX5-EIP, the following dedicated instruction is used to transmit a request message to the external device. Only 3E frame is supported.

Instruction	Description
GP.SLMPSND	Transmits an SLMP message to the SLMP device.

For details on other SLMP communication functions, refer to the following.

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

Socket communication function

For details on the socket communication function, refer to the following.

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

IP filter function

For details on the IP filter function, refer to the following.

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

IP address change function

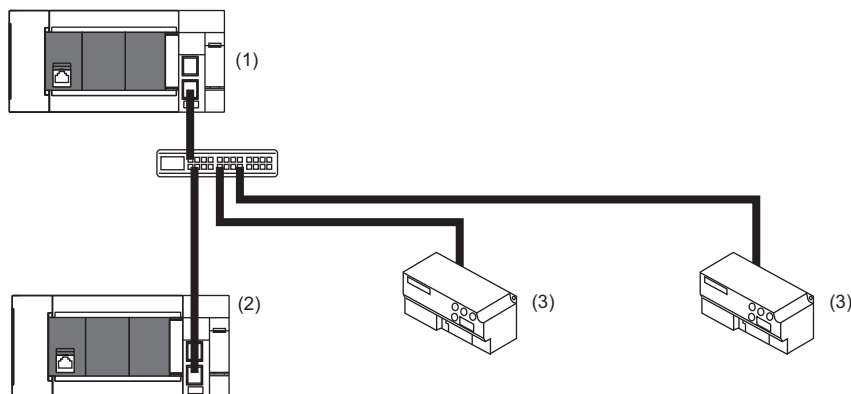
For details on the IP address change function, refer to the following.

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

5 SYSTEM CONFIGURATION

5.1 EtherNet/IP Configuration

The FX5-EIP can be connected to EtherNet/IP compatible devices and general-purpose TCP/IP devices.



- (1) FX5-EIP
- (2) EtherNet/IP compatible device
- (3) General-purpose TCP/IP devices

Scanner and adapter

In EtherNet/IP, station types are divided into scanner and adapter.

Station type	Description
Scanner	A station type of EtherNet/IP that corresponds to the master station. The scanner has the control information and controls the overall network. Devices that have a connection of originator or target can be operated as the scanner.
Adapter	A station type of EtherNet/IP that corresponds to the device station. The adapter indicates stations other than the scanner. Devices that have a connection of target can be operated as the adapter.

5.2 Standard Ethernet Communication Configuration

For details on the system configuration of standard Ethernet communication, refer to the [MELSEC iQ-F FX5 User's Manual \(Communication\)](#).

5.3 Available Software Packages

GX Works3 is required to set up the FX5-EIP.

For the compatible versions, refer to the following.

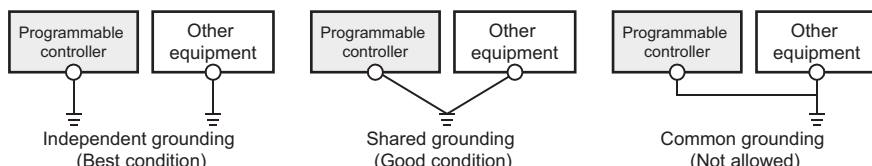
[MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual \(Hardware\)](#)

6 WIRING

6.1 Grounding

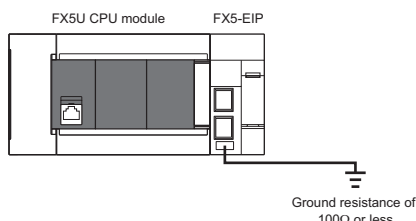
Perform the following.

- Provide grounding with a ground resistance of 100Ω or less.
- Ground the programmable controller independently when possible.
- If the programmable controller cannot be grounded independently, provide the "Shared grounding" shown below.



- Bring the grounding point close to the programmable controller as much as possible so that the ground cable can be shortened.

Grounding of FX5-EIP



- (1) Ground terminal of CPU module
- (2) FG terminal of FX5-EIP
- (3) Ground resistance of 100Ω or less

Terminal name	Description
⏏ FG (Ground terminal)	Provide grounding with a ground resistance of 100Ω or less.

The connection destination for the FG terminal of the FX5-EIP is a spring clamp terminal block.

To connect to the terminal block, there are two ways: by using single wires/strand wires or by using ferrules. Make sure to properly connect in accordance with the following specifications.

■Ferrule

The following table lists wire ferrules and its associated tools compatible with the terminal block. The shape of the wire ferrule differs depending on the crimp tool to be used, use the reference product. If products other than the referenced ones are used, the wire ferrule may become unremovable and may damage the terminal block. Verify that the wire ferrule can be removed before use.

<Reference product>

Manufacturer	Sleeve	Model	Wiring size	Crimp tool
PHOENIX CONTACT GmbH & Co. KG	Ferrules with insulation sleeve	Al 0.25-8 YE	0.25mm ²	CRIMPFOX 6
		Al 0.34-8 TQ	0.3, 0.34mm ²	
		Al 0.5-8 WH	0.5mm ²	
		Al 0.75-8 GY	0.75mm ²	
	Ferrules without insulation sleeve	A 0,25-7	0.25mm ²	
		A 0,34-7	0.3, 0.34mm ²	
		A 0,5-8	0.5mm ²	
		A 0,75-8	0.75mm ²	
		Al 1.0-8	1.0mm ²	
		Al 1.5-7	1.25, 1.5mm ²	

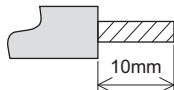
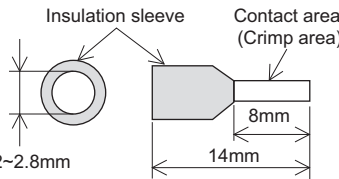
The wires to connect the spring clamp terminal block are described below.

Number of wires per terminal	Wire size		
	Single wire, strand wire	Ferrule with insulation sleeve	Ferrule without insulation sleeve
One wiring	24 to 16 AWG (0.2 to 1.5mm ²)	24 to 18 AWG (0.25 to 0.75mm ²)	24 to 16 AWG (0.25 to 1.5mm ²)

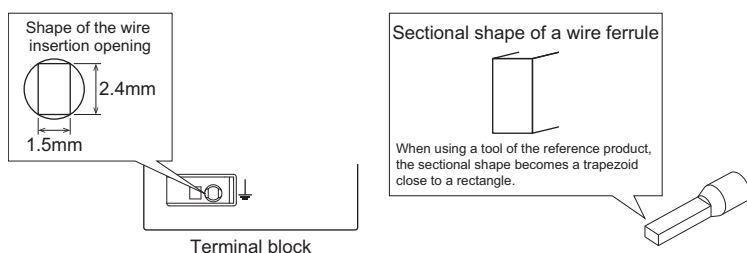
■Wire end treatment

Strip the cable about 10mm from the tip to connect a wire ferrule at the stripped area. Failure to do so may result in electric shock due to the conductive part. If the wire strip length is too short, it may result in the poor contact to the spring clamp terminal part.

Depending on the thickness of the sheath, it may be difficult to insert into the insulation sleeve, so select the wires by referring to the appearance diagram.

Strand wire/single wire	Ferrule with insulation sleeve
	

Check the shape of the wire insertion opening with the following chart, and use the smaller wire ferrule than the described size. Also, insert the wire with care so that the wire ferrule is in proper orientation. Failure to do so may cause the bite of the terminal and the damage of the terminal block.



■Connection and disconnection of the cable

- Connection of the cable

Fully insert a cable whose end has been properly processed into the wire insertion opening.

If the cable cannot be inserted with this procedure, fully insert the cable while pushing the open/close button with a flathead screwdriver having a tip width of 2.0 to 2.5mm. After fully inserting the cable, remove the screwdriver.

<Reference>

Manufacturer	Model
PHOENIX CONTACT GmbH & Co. KG	SZS 0.4 × 2.5 VDE

Precautions

Pull the cable or wire ferrule slightly to check that the cable is securely clamped.

- Disconnection of the cable

Push the open/close button of the wire to be disconnected with a flathead screwdriver. Pull out the wire with the open/close button pushed.

6.2 Wiring Method

This section describes how to connect and disconnect the Ethernet cable.

Connecting the cable

1. Turn the power supply of the FX5-EIP (CPU module) and external device off.
2. Pay attention to the orientation of the connector, and push the Ethernet cable into the FX5-EIP until it clicks.
3. Lightly pull the connector to check that the connector is securely connected.
4. Turn the power supply of the FX5-EIP (CPU module) and external device on.
5. Check whether the SPEED LED of the port connected with an Ethernet cable is on.*¹

*¹ The time between the cable connection and the turning on of the SPEED LED may vary. The indicator usually turns on within a few seconds. However, depending on the status of the devices on the line, the link-up processing may be repeated and the time may be longer.

Disconnecting the cable

1. Turn the power supply of the FX5-EIP (CPU module) off.
2. Unplug the Ethernet cable while pressing the latch connector down.

Precautions

- Place the Ethernet cable in a duct or clamp it. If the cable is not placed in a duct or secured with clamps, it may swing or move, and careless pulling can damage the module or cable. In addition, poor cable connections may cause malfunctions.
- Do not touch the core of the cable-side or module-side connector, and protect them from dirt or dust. If oil on your hands, dirt, or dust adheres to the core, transmission loss may increase, causing communication problems.
- Check that the Ethernet cable is not disconnected or not shorted and check that the cable is connected properly.
- Do not use Ethernet cables with broken latch connectors. Doing so may cause the Ethernet cables to be disconnected or the module to malfunction.
- Hold the connector part of the Ethernet cable when connecting or disconnecting it. Pulling the cable connected to the module may result in damage to the module or the cable, or cause a malfunction due to poor contact.
- For connectors without Ethernet cable, attached connector cover should be placed to prevent foreign matter such as dirt or dust.
- The maximum station-to-station distance of the Ethernet cable is 100m. However, the acceptable length may be shorter depending on the environment where the cable is used. For details, contact the cable manufacturer.
- The bending radius of the Ethernet cable is limited. For details, check the specifications of the Ethernet cable to be used.

6.3 Wiring Products

This section describes the devices used to comprise a network.

Ethernet cable

Use Ethernet cables that meet the following standards.

■EtherNet/IP

Communication speed	Specifications	Connector	Ethernet standard
100Mbps	Ethernet cable: Category 5 or higher (STP cable ^{*1})	RJ45 connector	100BASE-TX

■Standard Ethernet

Communication speed	Specifications	Connector	Ethernet standard
100Mbps	Ethernet cable: Category 5 or higher (STP cable ^{*1})	RJ45 connector	100BASE-TX
10Mbps	Ethernet cable: Category 3 or higher (STP/UTP cable ^{*1})	RJ45 connector	10BASE-T

^{*1} Shielded twisted pair cable

A straight/crossover cable can be used.



Depending on the connection environment, communication errors may occur due to high-frequency noise from devices other than programmable controllers. The FX5-EIP-side countermeasures to prevent high-frequency noise effects are as follows:

[Wiring]

- When wiring cables, do not bundle them together with or keep them in close proximity to the main circuit lines or power cables.
- Place cables in a duct.
- Use STP cables in place of UTP cables.

Industrial switch

For the models and usage methods of the industrial switches, refer to the ODVA website at www.odva.org.

- Use industrial switches that support the transmission speed of communication.
- Use of an industrial switches with the IGMP snooping function is recommended.
- An industrial switch can be used for cascade connection. When a cascade connection is used, check the specifications of the industrial switch used.

7 PARAMETER SETTINGS

This chapter describes the parameter settings required for EtherNet/IP and standard Ethernet communications with the FX5-EIP.

For details on each operation of GX Works3, refer to the  GX Works3 Operating Manual.

7.1 Procedure for Setting Parameters

- 1.** Add "Information Module (FX5-EIP)" to the engineering tool. ^{*1}
 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ Right-click ⇒ [Add New Module]
 - 2.** Set the parameter. ( Page 90 Basic Settings, Page 97 Application Settings)
 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter]
 - 3.** Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration". ( Page 99 EtherNet/IP Configuration)
 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]
 - 4.** Write parameters to the CPU module using the engineering tool.
 [Online] ⇒ [Write to PLC]
 - 5.** The settings are reflected by resetting the CPU module or powering off and on the system.
- ^{*1} The FX5-EIP can be added to GX Works3 also from the module configuration diagram.

7.2 Basic Settings

Set the IP address and functions of the FX5-EIP.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 3 . 251
Subnet Mask	.
Default Gateway	.
Communication Data Code	Binary
Opening Method	Do Not Open by Program
EtherNet/IP Setting	
Maximum Number of Connections Setting	
Maximum Number of Connections Setting	64 connections
Refresh Settings	<Detailed Setting>
EtherNet/IP Auto-start Setting	
EtherNet/IP Auto-start Setting	Not to Start
External Device Configuration	
External Device Configuration	<Detailed Setting>

Explanation
Set the information of the own node such as IP address.

Check Restore the Default Settings Apply

Own Node Settings

Set the IP address, communication data code, and opening method of the FX5-EIP.

Item		Description	Setting range
IP Address Setting	IP Address	Set the IP address of the FX5-EIP.*1 Set the class and subnet address of the FX5-EIP to the same settings as those of the EtherNet/IP devices that communicate with the FX5-EIP.	<ul style="list-style-type: none"> • Empty (Default) • 0.0.0.1 to 223.255.255.254*2
	Subnet Mask	Set the subnet mask of the FX5-EIP. When setting the IP address of the default gateway and performing communication with an EtherNet/IP device in another network through a router, set the subnet mask pattern of the default gateway. All the devices in the same subnetwork should have a common subnet mask. The subnet mask setting is not required for communication in a single network.	<ul style="list-style-type: none"> • Empty (Default) • 0.0.0.1 to 255.255.255.255*3
	Default Gateway	Set the default gateway of the FX5-EIP. Set the IP address of the relay device (default gateway) to access the EtherNet/IP device in another network. ■Setting conditions <ul style="list-style-type: none"> • The class of the IP address is A, B, or C. • The subnet address of the default gateway is the same as that of the FX5-EIP. • The host address is not all "0" or "1". 	<ul style="list-style-type: none"> • Empty (Default) • 0.0.0.1 to 223.255.255.254
Communication Data Code		Select the data format to be used for communication.	<ul style="list-style-type: none"> • Binary (Default) • ASCII (X, Y OCT) • ASCII (X, Y HEX)
Opening Method		Select how to open a connection. <ul style="list-style-type: none"> • Do Not Open by Program: Select this item to perform open processing and open the connection by the external device. Program for open/close processing is not required. • Open by Program: Select this item to perform open/close processing and open/close the connection by a program. 	<ul style="list-style-type: none"> • Do Not Open by Program (Default) • Open by Program

*1 When the parameter is written without the IP address setting (blank), the following address is set.
192.168.3.251

*2 If the first octet is 0 or 127, a parameter error occurs.

*3 If a value outside the range between 128.0.0.0 and 255.255.255.252 is entered, a parameter error occurs.

EtherNet/IP Setting

Set the parameters for EtherNet/IP communications.

Item	Description	Setting range
Maximum Number of Connections Setting	Set the maximum number of available connections (connection number). The maximum communication data size changes depending on the maximum number of connections. (☞ Page 91 Maximum Number of Connections Setting)	<ul style="list-style-type: none">• 64 connections (Default)• 128 connections
Refresh Settings	Set the refresh between the buffer memory areas and the devices in the CPU module. (☞ Page 92 Refresh Settings)	—
EtherNet/IP Auto-start setting	Set the EtherNet/IP communication automatic start setting.	<ul style="list-style-type: none">• Not to Start (Default)• Start

Maximum Number of Connections Setting

Set the maximum number of connections (connection number) available for the EtherNet/IP communications.

The maximum communication data size changes depending on the maximum number of connections.

The following table lists the maximum data size of each communication depending on the setting value.

Item			Setting	
			64 connections	128 connections
Communication data size (byte)	Class1 communications	Instance communications	1444	600
		Tag communications	1444	600
	Class3 communications	Instance communications	1404	600
		Tag communications	496	496
	UCMM communications	Instance communications*1	504	504
		Tag communications	498	498

*1 The data size includes headers.

When the maximum number of connections setting is changed, review "Refresh Settings" and "EtherNet/IP Configuration (Module Extended Parameter)" as necessary.

☞ Page 92 Refresh Settings

☞ Page 99 EtherNet/IP Configuration

Since the data area address also changes, review the program when the buffer memory address is referenced directly from the program.

☞ Page 225 Buffer Memory

Refresh Settings

Set the refresh between the buffer memory areas and the devices in the CPU module.

Open the refresh settings and set the refresh target.

- When the refresh target is "Device": Enable "Auto-refresh" for the connections to be refreshed, and set each item.
- When the refresh target is "Do not Use Auto-refresh": "Auto-refresh" is disabled for all connections and other items are left unset.

■Setting item (Transfer to Network module/Transfer to CPU module)

Setting item	Description	Range
Connection numbers 1 to 128^{*1}		
Auto-refresh	Select whether to enable auto refresh between the specified area and the CPU module.	<ul style="list-style-type: none"> • Disable (Default) • Enable
Device Name	Set the CPU device to be refreshed.	<ul style="list-style-type: none"> ■ Transfer to Network Module • Empty (Default) • Y, M, L, B, D, W, R ■ Transfer to CPU Module • Empty (Default) • X, M, L, B, D, W, R
Points	Set the number of points to be refreshed in decimal. (When the device assignment method ^{*3} is selected as Start/End, the number of refresh points is displayed in decimal.)	Follow the device setting of the CPU parameter.
Start ^{*2}	Set the device number of the CPU device that will be the start of the refresh range.	Follow the device setting of the CPU parameter.
End ^{*2}	Set the device number of the CPU device that will be the end of the refresh range. (When the device assignment method is selected as Points/Start, the end of the refresh range is displayed.)	Follow the device setting of the CPU parameter.

^{*1} When "Maximum Number of Connections Setting" is 64 connections, connection numbers from 65 to 128 cannot be set.

^{*2} The notation format varies depending on the CPU type and CPU device type.

For the FX5 CPU: M, L, D, and R are displayed in decimal. X and Y are displayed in octal. B and W are displayed in hexadecimal.
MX controllers (MX-F models): M, L, D, and R are displayed in decimal. X, Y, B, and W are displayed in hexadecimal.

^{*3} Right-click in the setting window and select a link device assignment method.

· Start/End: Enter the start and end numbers of link devices.

· Points/Start: Enter the numbers of points and start numbers of link devices.

Precautions

- Set the CPU module devices in the refresh settings so that they do not overlap with the devices used in the refresh settings of modules other than the FX5-EIP, or with the I/O numbers used by I/O modules and intelligent function modules.
- The number of device points to be set in the refresh settings should match the data size set in "EtherNet/IP Configuration". If the number of set device points is less than the data size, data inconsistency of transmit/receive data cannot be prevented. If the number of set device points exceeds the data size, data other than the receive data may be read into the device or the data written to the device may not be transmitted.
- When the refresh is enabled, the refresh target values are enabled and buffer memory areas are overwritten with the refresh target values. To change the refresh target values in the buffer memory areas, create a program that changes the values in the refresh target module labels and devices.
- Since the auto refresh processing function applies only to cyclic communication, do not set the refresh for connection numbers for which cyclic communication is not set. If the refresh is set for a message communication connection, incorrect data is transferred.



Data inconsistency in transmit/receive data can be prevented using "Auto-refresh".

■Auto refresh processing time

The auto refresh processing time depends on the performance on the CPU module side.

If the data size of all connections is set to 128 bytes^{*1}, the maximum extended scan time is approximately $150\mu\text{s} \times$ the number of connections.

^{*1} This data size applies when both $T \rightarrow O$ and $O \rightarrow T$ are refreshed in Exclusive Owner.

Precautions

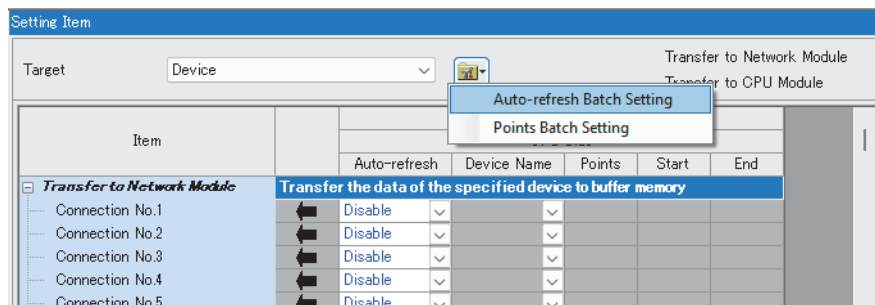
When data is transferred to a CPU module, the refresh processing is not performed if the input data for the corresponding connection has not changed since the previous transfer. Therefore, the refresh processing time may increase or decrease depending on the update frequency of input data. Set the constant scan setting to maintain a fixed scan time.

■Refresh settings using the auto-refresh batch setting and the points batch setting

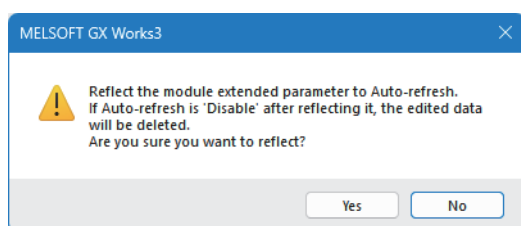
Data inconsistency in transmit/receive data can be prevented using "Auto-refresh".

The setting method is described below.

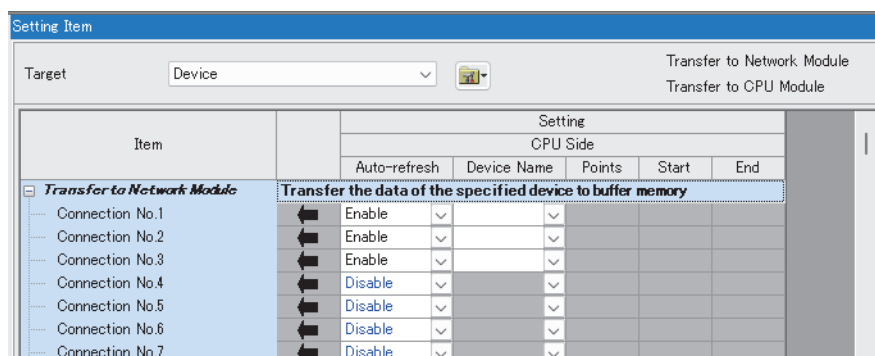
1. Select "Auto-refresh Batch Setting" from the toolbox while the refresh target is set to "Device".



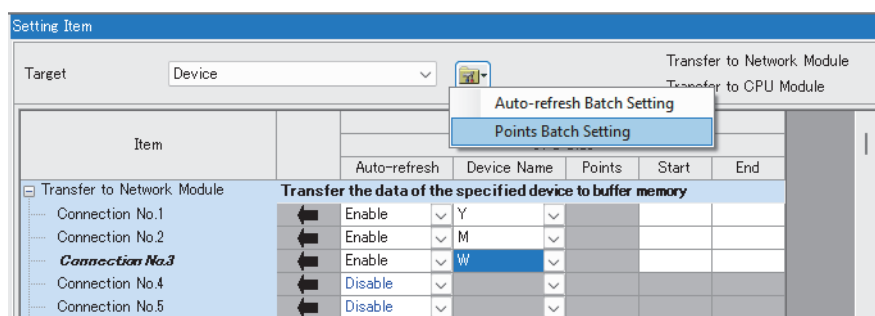
2. When the confirmation dialog appears, click the [Yes] button.



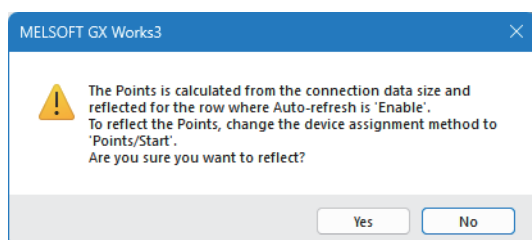
3. By using "Auto-refresh Batch Setting", connection data which is available for auto refresh is read from "EtherNet/IP Configuration" and is reflected to "Auto-refresh".



4. Set "Device Name" and select [Points Batch Setting] from the toolbox.



5. When the confirmation dialog appears, click the [Yes] button.



6. By using "Points Batch Setting", connection data for which auto refresh is enabled is read from "EtherNet/IP Configuration" and is reflected to "Points".

Item	Setting				
	Auto-refresh	Device Name	Points	Start	End
Transfer to Network Module					
Connection No.1	Enable	Y	16		
Connection No.2	Enable	M	16		
Connection No.3	Enable	W	1		
Connection No.4	Disable				
Connection No.5	Disable				

7. Enter the "Start" value and complete this setting.

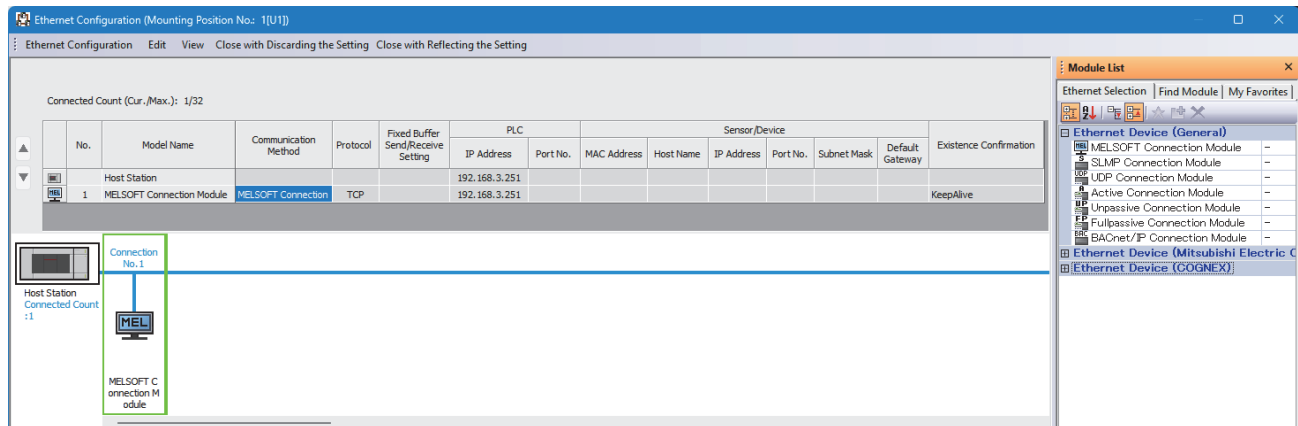


- When a value in "Start" is specified before using "Points Batch Setting", the connection data is reflected to "End" as well as "Points".
- By using "Points Batch Setting", the device setting method will be changed from "Start/End" to "Points/Start".

External Device Configuration

Set the method and protocol used for communicating with external devices.

Double-click <Detailed Setting> of the "External Device Configuration".



Drag and drop an "Ethernet Device" in the "Module List" to the left side of the window, and set the following items. The setting items vary depending on the "Ethernet Device" and "Communication Method".

To detect and set the Ethernet devices connected to the CPU module, click the [Detect Now] button.

Item		Description	Setting range
No.		Connection number for distinguishing settings for each user connection	—
Model Name		The name of the external device is displayed.	—
Communication Method		Set the method for communication with the external device.*1	<ul style="list-style-type: none"> • MELSOFT Connection • SLMP • Socket Communication
Protocol		Select the communication protocol for the external device.*1	<ul style="list-style-type: none"> • TCP • UDP
Fixed Buffer Send/Receive Setting		Not supported.	—
PLC	IP Address	The IP address of the own station (FX5-EIP) is displayed.	—
	Port No.	Set the port number of the own station (FX5-EIP).	<ul style="list-style-type: none"> • Empty (Default) • 1 to 2221, 2223 to 5548, 5570 to 44817, 44819 to 49511*2
Sensor/Device	MAC Address	Not supported.	—
	Host Name	Not supported.	—
	IP Address	Set the IP address of the external device.	<ul style="list-style-type: none"> • Empty (Default) • 0.0.0.1 to 223.255.255.254
	Port No.	Set the port number of the external device.	<ul style="list-style-type: none"> • Empty (Default) • 1 to 65534
	Subnet Mask	Set the subnet mask of the external device.	—
	Default Gateway	Set the default gateway of the external device.	—
Existence Confirmation		Select the method of alive check which is performed when the module has not communicated with the external device for a certain period of time. When the module cannot communicate with the external device, the connection will be closed.*1	<ul style="list-style-type: none"> • KeepAlive • Do not confirm existence

*1 Automatically set by the "Ethernet Device".

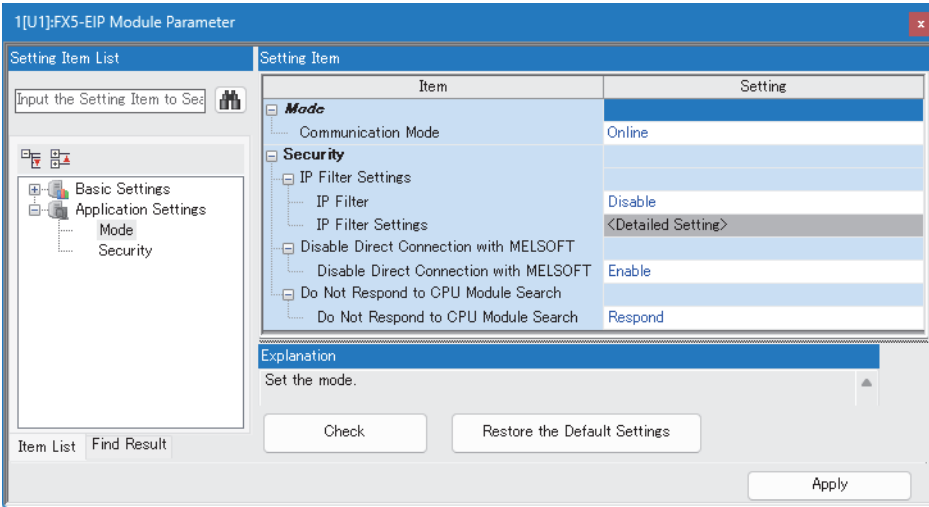
The protocol can be selected only when "Communication Method" is "SLMP".

*2 Do not specify 2222, 5549 to 5569, 44818, or 49512 and higher, as these ports are used by the system.

7.3 Application Settings

Set the operation mode and security function of the FX5-EIP.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Application Settings]



Mode Setting

Set the operation mode of the FX5-EIP.

Item	Description	Setting range
Communication Mode	Set the operation mode of the FX5-EIP. <ul style="list-style-type: none">• Online: Normal operation mode• Hardware test: Mode in which the module performs a self-diagnostics test Select this mode when checking the operation of the module due to an error or similar problem. (Page 186 Hardware Test)	<ul style="list-style-type: none">• Online (Default)• Hardware test



In the hardware test mode, other parameters cannot be set.

Security

Set the security function.

Item	Description	Setting range
IP Filter Settings	IP Filter	Set whether to enable the IP filter function. <ul style="list-style-type: none">• Disable (Default)• Enable
	IP Filter Settings	Set the IP address to be allowed or denied. (Page 98 IP Filter Settings) —
Disable Direct Connection with MELSOFT	Permit/prohibit direct connection with the engineering tool.	<ul style="list-style-type: none">• Disable• Enable (Default)
Do Not Respond to CPU Module Search	Set whether to respond to search for the CPU modules on the network.	<ul style="list-style-type: none">• Do Not Respond• Respond (Default)

IP Filter Settings

Set the IP address for which the IP filter function will be used.

 Double-click <Detailed Setting> of the "IP Filter Settings".

Setting Item

Access from IP address below Deny

No.	Range Setting	IP Address	IP Address Excluded from Range
1	☒	. . . - . . .	
2	☐		
3	☐		
4	☐		
5	☐		
6	☐		
7	☐		
8	☐		
9	☐		
10	☐		

Setting for IP Address to Exclude

Target IP Address
. . . - . . .

No.	IP Address to Exclude
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

OK Cancel

Item	Description	Setting range
Access from IP address below	Select whether to allow or deny the access from the specified IP addresses.	<div>• Allow (Default)</div> <div>• Deny</div>
Range Setting	Select this item when specifying the IP addresses by range.	—
IP Address	Set the IP address 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.	<div>• Empty (Default)</div> <div>• 0.0.0.1 to 223.255.255.254</div>
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.	<div>• Empty (Default)</div> <div>• 0.0.0.1 to 223.255.255.254</div>

7.4 EtherNet/IP Configuration

This section describes the EtherNet/IP settings.

Procedure for setting parameters

Set the parameters of the EtherNet/IP configuration device. The parameters differ depending on the communication method to be used.

- Page 100 Setting the Class1 instance communications
- Page 102 Setting the Class1 tag communications
- Page 104 Setting the Class3 instance communications
- Page 105 Setting the Class3 tag communications
- Page 106 Setting the Class3/UCMM tags

For the common settings, refer to the following.

- Page 99 Common settings

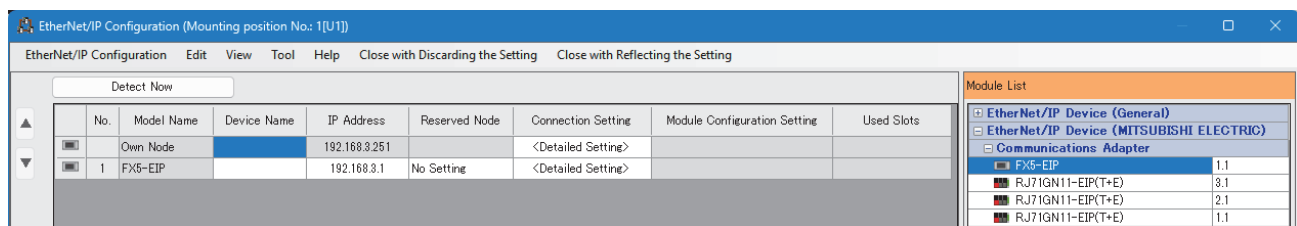
Common settings

■When the FX5-EIP is used as an originator/client

1. Open the "EtherNet/IP Configuration" window.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

2. Register the EDS file of the external device. (Page 122 Adding/deleting the EDS file)
3. Select the EtherNet/IP device of the external device in "Module List" and drag and drop it to the list of EtherNet/IP devices.



4. Set the items such as the device name and IP address of the EtherNet/IP device of the external device.
5. Double-click "<Detailed Setting>" in the "Connection Setting" column of the FX5-EIP and set the connection of the EtherNet/IP device.

■When the FX5-EIP is used as a target/server

1. Open the "EtherNet/IP Configuration" window.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

2. Double-click "<Detailed Setting>" in the "Connection Setting" column of the FX5-EIP and set the connection of the EtherNet/IP device.

Point

The FX5-EIP can be configured together with originator/client and target/server.

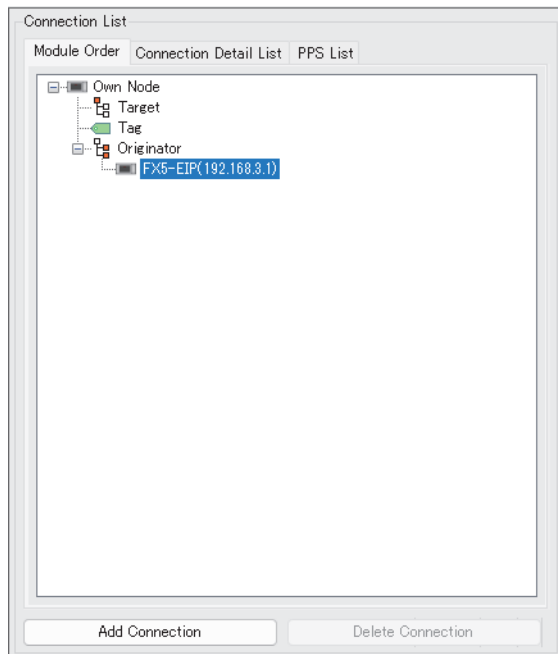
Setting the Class1 instance communications

To perform Class1 instance communications for the EtherNet/IP device, follow the procedure below.

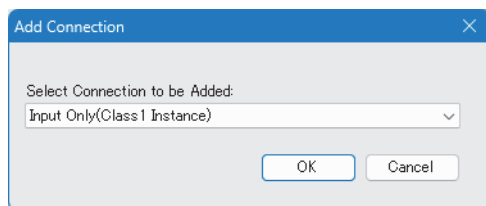
■When the FX5-EIP is set as an originator

1. Configure the settings to communicate with the target using the own node as an originator.

Select the EtherNet/IP device under "Originator" in "Connection List" and click the [Add Connection] button.



2. Select the instance communication connection*1 in "Select Connection to be Added:" and click the [OK] button.



*1 The displayed content varies depending on the EDS of the EtherNet/IP device. For details, refer to the manual for the external device.

3. Set the parameter for the Class1 instance communications in "Detailed Connection Settings". (Page 113 Originator: Class1 instance communications)

Point

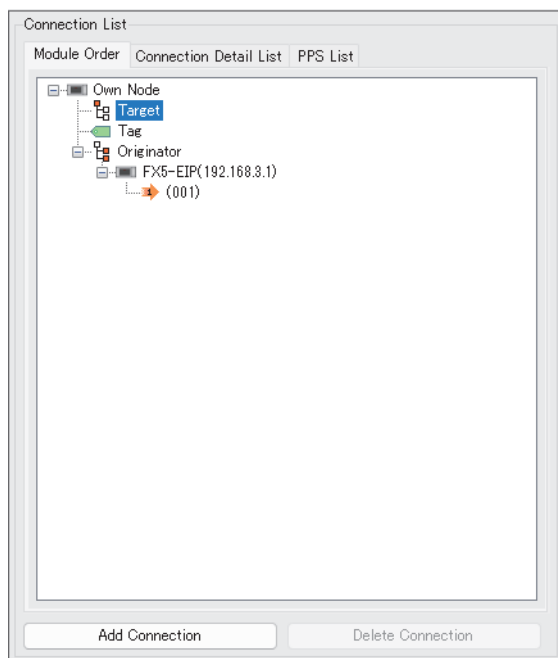
- For "Instance ID" under "Input T->O", set the instance ID of the connection to be communicated with a device as the target.
- For "Data Size" under "Input T->O", set the data size of the connection to be communicated with a device as the target.

4. Click the [OK] button to reflect the parameters.

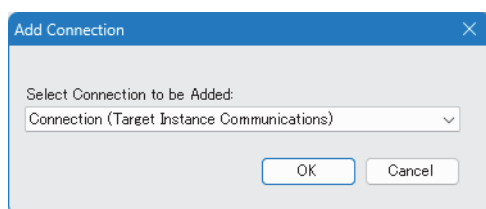
5. Click [Close with Reflecting the Setting] to close the "EtherNet/IP Configuration" window.

■When the FX5-EIP is set as a target

1. Double-click <Detailed Setting> in the "Connection Setting" column in the "EtherNet/IP Configuration" window, and open the connection of the EtherNet/IP device.
2. Configure the settings to communicate with the originator using the own node as a target.
Select "Target" from "Connection List" and click the [Add Connection] button.



3. Select "Connection (Target Instance Communications)" in "Select Connection to be Added:" and click the [OK] button.



4. Set the parameter for the Class1 instance communications in "Detailed Connection Settings". (👉 Page 111 Target: Instance communications)

Point

When setting an instance ID to a value of 100 to 199, select "[FX5-ENET/IP compatible]" for the connection on the originator side. For details, refer to the manual for the external device.

5. Click the [OK] button to reflect the parameters.
6. Click [Close with Reflecting the Setting] to close the "EtherNet/IP Configuration" window.

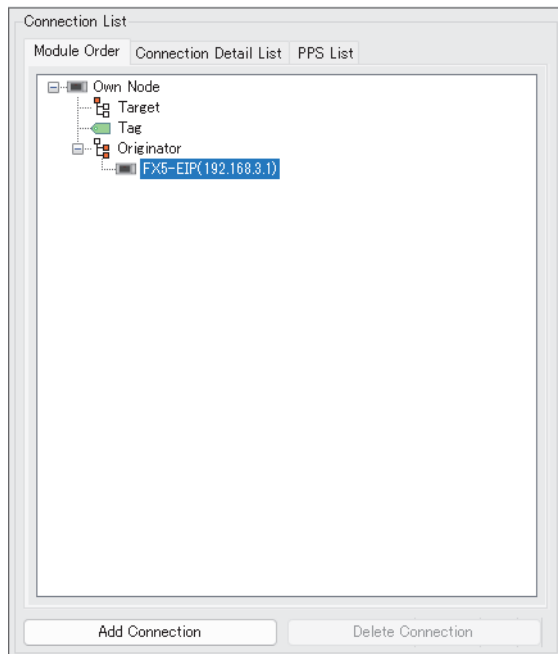
Setting the Class1 tag communications

To perform Class1 tag communications for the EtherNet/IP device, follow the procedure below.

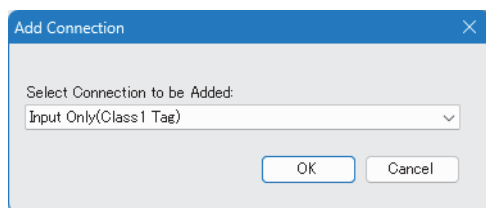
■When the FX5-EIP is set as an originator

1. Configure the settings to communicate with the target using the own node as an originator.

Select the EtherNet/IP device under "Originator" in "Connection List" and click the [Add Connection] button.



2. Select the tag communication connection^{*1} in "Select Connection to be Added:" and click the [OK] button.



^{*1} The displayed content varies depending on the EDS of the EtherNet/IP device. For details, refer to the manual for the external device.

3. Set the parameter for the Class1 tag communications in "Connection Detailed Setting". (☞ Page 115 Originator: Class1 tag communications)

Point

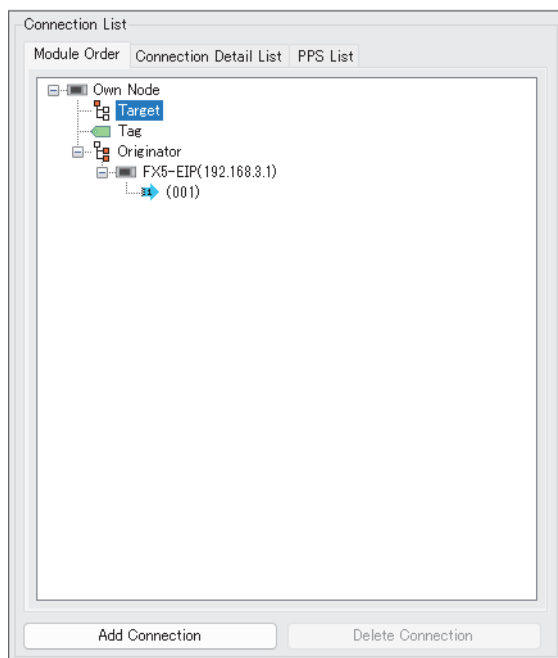
- For "Tag Name", set the tag name of the connection to be communicated with as the target.
- For "Data Size" under "Input T->O", set the data size of the connection to be communicated with a device as the target.

4. Click the [OK] button to reflect the parameters.

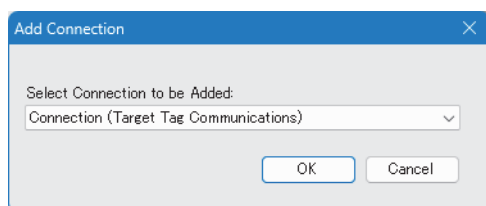
5. Click [Close with Reflecting the Setting] to close the "EtherNet/IP Configuration" window.

■When the FX5-EIP is set as a target

1. Double-click <Detailed Setting> in the "Connection Setting" column in the "EtherNet/IP Configuration" window, and open the connection of the EtherNet/IP device.
2. Configure the settings to communicate with the originator using the own node as a target.
Select "Target" from "Connection List" and click the [Add Connection] button.



3. Select "Connection (Target Tag Communications)" in "Select Connection to be Added:" and click the [OK] button.



4. Set the parameter for the Class1 tag communications in "Connection Detailed Setting". (☞ Page 112 Target: Tag communications)
5. Click the [OK] button to reflect the parameters.
6. Click [Close with Reflecting the Setting] to close the "EtherNet/IP Configuration" window.

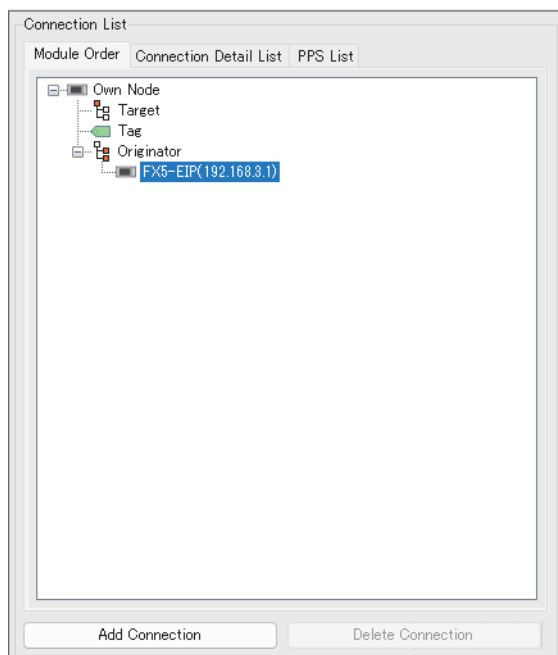
Setting the Class3 instance communications

To perform Class3 instance communications for the EtherNet/IP device, follow the procedure below.

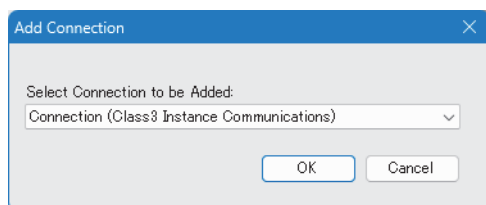
Set Class3 instance communications only when the own station operates as a client.

1. Configure the settings to transmit a request to the server.

Select the EtherNet/IP device under "Originator" in "Connection List" and click the [Add Connection] button.



2. Select "Connection (Class3 Instance Communications)" in "Select Connection to be Added:" and click the [OK] button.

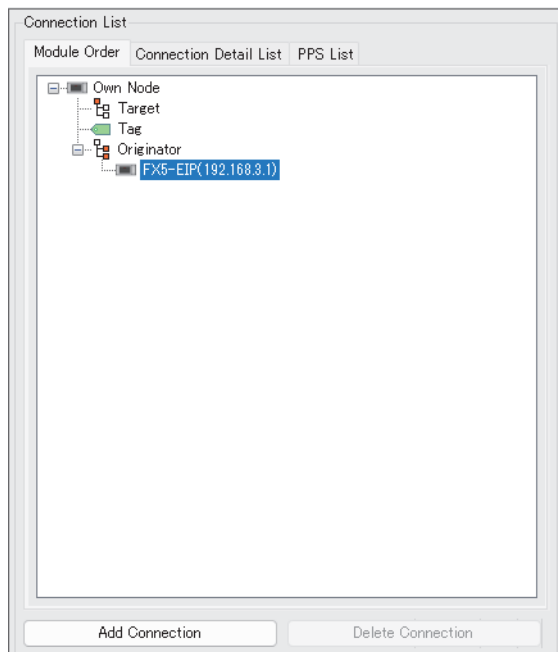


3. Set the parameter for the Class3 instance communications in "Detailed Connection Settings". (☞ Page 117 Originator: Class3 instance communications)
4. Click the [OK] button to reflect the parameters.
5. Click [Close with Reflecting the Setting] to close the "EtherNet/IP Configuration" window.

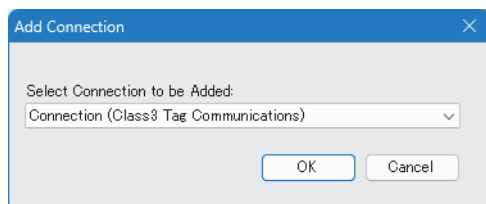
Setting the Class3 tag communications

To perform Class3 tag communications for the EtherNet/IP device, follow the procedure below.

1. Configure the settings to transmit data to the server (target) using the own station (originator) as a client. Select the EtherNet/IP device under "Originator" in "Connection List" and click the [Add Connection] button.



2. Select "Connections (Class3 Tag Communications)" in "Select Connection to be Added:" and click the [OK] button.

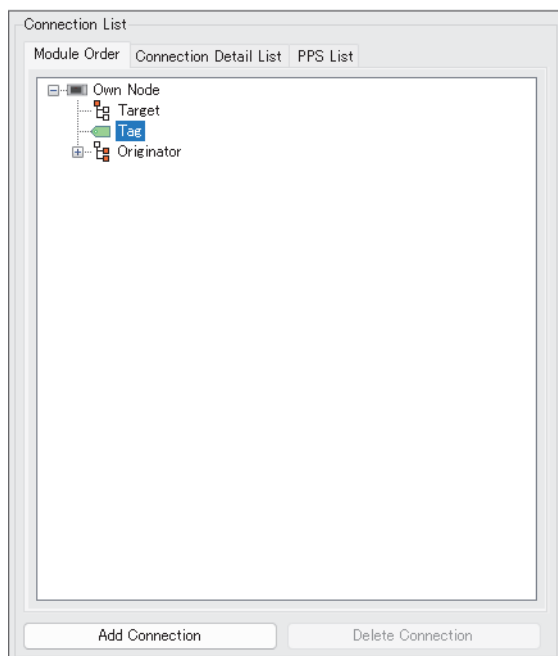


3. Set the parameter for the Class3 tag communications in "Connection Detailed Setting". (☞ Page 118 Originator: Class3 tag communications)
4. Click the [OK] button to reflect the parameters.
5. Click [Close with Reflecting the Setting] to close the "EtherNet/IP Configuration" window.

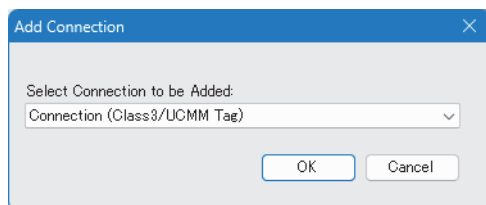
Setting the Class3/UCMM tags

To perform message communications with the external device when operating as the server (target) in the tag communications, follow the procedure below.

1. Double-click <Detailed Setting> in the "Connection Setting" column in the "EtherNet/IP Configuration" window, and open the connection of the EtherNet/IP device.
2. Select "Tag" in "Connection List" and click the [Add Connection] button.



3. Select "Connection (Class3/UCMM Tag)" in "Select Connection to be Added:" and click the [OK] button.

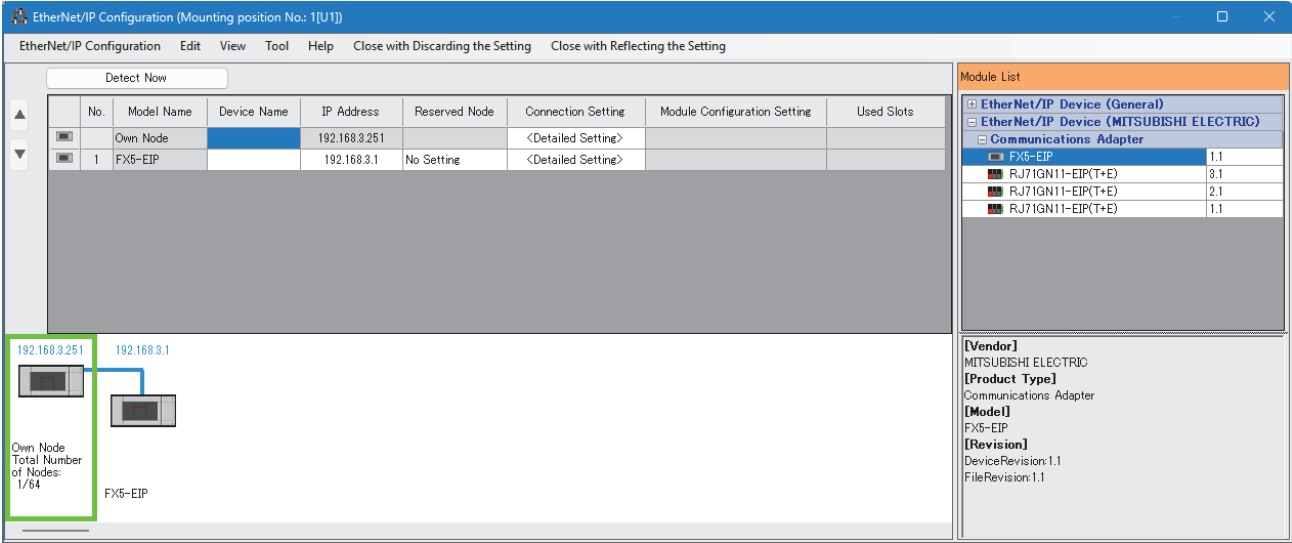


4. Set the parameter for the UCMM tag communications in "Connection Detailed Setting". (👉 Page 112 Tag: Class3/UCMM tag)
5. Click the [OK] button to reflect the parameters.
6. Click [Close with Reflecting the Setting] to close the "EtherNet/IP Configuration" window.

EtherNet/IP Configuration window

The following window is used to set the communication parameters for the EtherNet/IP device.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]



Item	Description	Setting range
No.	Displays the row number. For the own node, this field is blank.	—
Model Name	Displays the model of the EtherNet/IP device. For the own node, "Own Node" is displayed.	—
Device Name	Set the name of a device if required. For the own node, this item cannot be set.	Up to 32 characters (one-byte or two-byte)
IP Address	Set the IP address of the EtherNet/IP device. For the own node, it displays the IP address set in "IP Address".	0.0.0.1 to 223.255.255.254
Reserved Node	Set the EtherNet/IP device to the reserved node. For the own node, this item cannot be set. <ul style="list-style-type: none"> No Setting: The EtherNet/IP device is connected to the network. Reserved Node: The EtherNet/IP device is reserved in the parameters for future expansion. By using a reserved node, buffer memory area assignment will not change even if the EtherNet/IP device is added (reservation is canceled). Therefore, modification of the program is not required. Physical connection of the EtherNet/IP device on the network is not required. 	<ul style="list-style-type: none"> No Setting (Default) Reserved Node
Connection Setting	Set the connection for the EtherNet/IP communications.	☞ Page 110 Connection Setting
Module Configuration Setting	Set the module for EtherNet/IP communications. This item cannot be set for the own node or modules to which modules cannot be installed.	☞ Page 121 Module Configuration setting
Number of Used Slots	Displays the number of slots to be used set in "Module Configuration Setting".	—

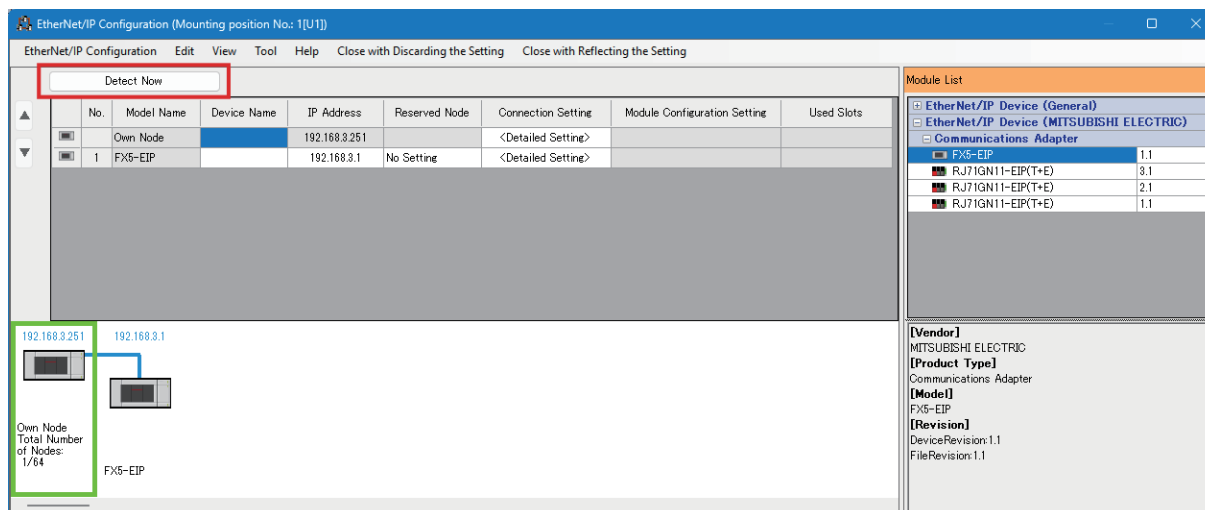
Automatic detection of EtherNet/IP devices

This function detects EtherNet/IP devices on the same network connected to the FX5-EIP and automatically adds them to the list of EtherNet/IP configuration devices.

This function simplifies parameter settings when a network system is set up or its configuration is changed.

Operation method

Automatic detection of EtherNet/IP devices can be executed by clicking the [Detect Now] button on the "EtherNet/IP Configuration" window.



Condition

This function can be executed by satisfying the following conditions.

Condition	Details
The IP address of the FX5-EIP is set in the CPU module. (☞ Page 90 Basic Settings)	Write the following parameters of the FX5-EIP to the CPU module using the engineering tool. <ul style="list-style-type: none"> Module parameter Module extension parameter (EtherNet/IP Configuration)^{*1}
The port of the FX5-EIP is connected to the EtherNet/IP device with an Ethernet cable.	Connect the EtherNet/IP device to be detected by this function to the port of the FX5-EIP. To use an Ethernet switch, connect the EtherNet/IP device within the range of broadcast frames from the own station.

^{*1} The module extension parameters need to be written in advance, even if they are not configured. Otherwise, a moderate error will occur.

EtherNet/IP devices that can be detected

Connected EtherNet/IP devices are detected within the range of broadcast frames from the own station. (128 modules maximum)

The EtherNet/IP communication module is detected for the chassis-based EtherNet/IP devices; however, other connected modules in the chassis are not detected. In such cases, add the modules manually. ^{*1}

^{*1} There are two types of chassis-based EtherNet/IP devices (chassis-attached modules) as follows.

- Type in which modules such as I/O modules are connected next to a CPU module as a base
- Type in which CPU modules and modules responsible for communication I/O are mounted on the base unit

However, since EtherNet/IP devices cannot be determined by their appearance, determine them by the content of the Modular area in the EDS file. (For details, refer to the EtherNet/IP specifications.)

■To detect the FX5-EIP

To detect the FX5-EIP with this function, check that 'EtherNet/IP communication start status' (Un\G273) is set to 1 (Operating). (The same applies for detection of the FX5-EIP with the EtherNet/IP device detection function executed from other products.)
*1

Automatic detection of EtherNet/IP devices uses the ListIdentity command to detect the EtherNet/IP devices on the network.
*2

Therefore, the FX5-EIP must be set in start status for EtherNet/IP communications.

*1 For how to set 'EtherNet/IP communication start status' (Un\G273) to 1 (Operating), refer to the following.

 Page 79 EtherNet/IP Communication Automatic Start Function

*2 For details on the ListIdentity command, refer to the EtherNet/IP specifications.

Point

Devices cannot be detected if they cannot respond to the ListIdentity command for EtherNet/IP communications due to reasons such as the following.

- The device does not support the ListIdentity command.
- The device is disconnected from the EtherNet/IP network.
- EtherNet/IP communications have not started up.
- EtherNet/IP communications are stopped.
- The IP address of the EtherNet/IP device overlaps with that of another device.

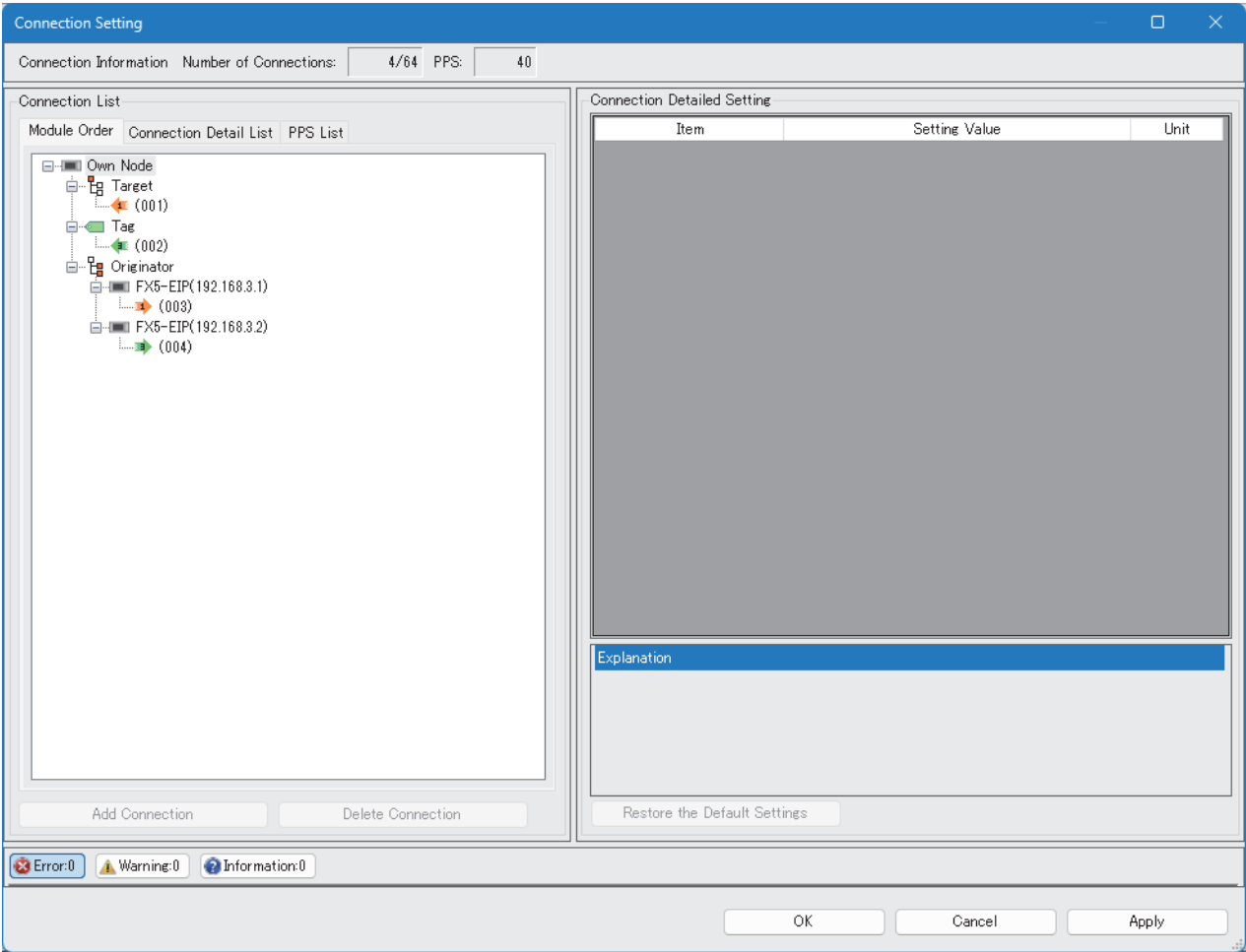
To check if an external device can respond to the ListIdentity command, refer to the manual of that device.

■Precautions

- When executing this function, wait about 10 seconds after completion before executing automatic detection of EtherNet/IP devices again. (If communications have been disconnected, wait about 1 minute before executing automatic detection of EtherNet/IP devices again.)
- While this function is being executed, automatic detection of EtherNet/IP devices from other EtherNet/IP Configuration tools is not possible.
- If the number of EtherNet/IP devices connected to the network exceeds 128, devices beyond the 128th are not displayed in the detection results. Because detection is performed in random order, the detected devices are displayed in random order.
- If 'EtherNet/IP communication start status' (Un\G273) is changed from 1 (Operating) to 0 (Stopped) while this function is being executed, some modules may be excluded from the automatic detection of EtherNet/IP devices. While this function is being executed, do not operate 'EtherNet/IP communication start request' (Un\G272) or change the CPU module status (for example from RUN to STOP).
- This function can detect up to 128 devices regardless of whether the user parameter "Maximum Number of Connections Setting" is set to "64 connections" or "128 connections".

Connection Setting

Set the connection for the EtherNet/IP communications.



Item		Description
Connection List	Module Order	Displays the list of connections. The module order, connection detail list, or communication processing performance (PPS) list can be switched by clicking a corresponding tab. Select an item and click the [Add Connection] button to display the "Add Connection" window. After selecting the connection, click the [OK] button to add the connection.
	Connection Detail List	Displays a list of the details on each connection.
	PPS List	Displays a list of the PPS (communication processing performance) for each connection.
Connection Detailed Setting		Detailed settings can be performed for the selected connection.

The following table lists connections that can be added in Module Order.

Target	Tag	Originator
Manages the connection settings when the own node is used as a target. <ul style="list-style-type: none">• Class1 instance communications• Class1 tag communications	Manages the connection settings when the own node is used as a server (a target). <ul style="list-style-type: none">• UCMM tag communications• Class3 tag communications	Manages the connection settings when the own node is used as an originator. The modules registered in the list of EtherNet/IP devices are displayed. Connections are managed for each module. <ul style="list-style-type: none">• Class1 instance communications• Class1 tag communications• Class3 instance communications• Class3 tag communications

■Target: Instance communications

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Target Instance Communications)	—
Application Type	Input Only	—
Connection No.	001	—
Communication Method	Instance Communications	—
Comment		—
Output T->O		
Data Size	2	bytes
Instance ID	768	—
Input O->T		
Data Size	—	—
Instance ID	—	—

Item		Description	Setting range
Connection Name		Displays the connection name.	—
Application Type		Set the application type.	<ul style="list-style-type: none"> Input Only (Default) Exclusive Owner
Connection No.		Set the connection number. The default value is the minimum value from the unused connection numbers in the connection list.	1 to 64 ^{*1}
Communication Method		Displays the communication method.	—
Comment		Set comments to the connection if required.	Up to 32 characters (one-byte or two-byte)
Output T->O	Data Size	Set the data size. (Unit: bytes)	1 to 1444 ^{*2}
	Instance ID	Set the instance ID.	100 to 199, 768 to 895 (depending on the connection number) ^{*3}
Input O->T	Data Size	Set the data size. (Unit: bytes) This item can be set only when "Application Type" is set to "Exclusive Owner".	1 to 1444 ^{*2}
	Instance ID	Set the instance ID. This item can be set only when "Application Type" is set to "Exclusive Owner".	100 to 199, 1024 to 1151 (depending on the connection number) ^{*3}

*1 When the maximum number of connections is set to 128, the setting range is from 1 to 128.

*2 When the maximum number of connections is set to 128, the setting range is from 1 to 600.

*3 The fixed value is set according to the connection number for the instance ID. If the FX5-EIP needs to be the target with the same settings as when the FX5-ENET/IP is the target, the value can be changed to any value within the range of 100 to 199. For details on the instances ID, refer to the following.

📖 Page 34 Instance ID

■Target: Tag communications

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Target Tag Communications)	—
Application Type	Input Only	—
Connection No.	001	—
Communication Method	Tag Communications	—
Comment		—
Tag Name	Tag001	—
Tag Name Size	6	Characters
Data Size	2	bytes

Item	Description	Setting range
Connection Name	Displays the connection name.	—
Application Type	Displays the application type. For the tag communication, only InputOnly can be set.	—
Connection No.	Set the connection number. The default value is the minimum value from the unused connection numbers in the connection list.	1 to 64 ^{*1}
Communication Method	Displays the communication method.	—
Comment	Set comments to the connection if required.	Up to 32 characters (one-byte or two-byte)
Tag Name	Set the tag name. The default name is set as "Tag" + the numerical value of the connection number. Tag names are not case-sensitive.	Up to 255 characters (one-byte only)
Tag Name Size	Displays the number of characters in the string displayed in "Tag Name". (Unit: characters)	—
Data Size	Set the data size. (Unit: bytes)	1 to 1444 ^{*2}

*1 When the maximum number of connections is set to 128, the setting range is from 1 to 128.

*2 When the maximum number of connections is set to 128, the setting range is from 1 to 600.

■Tag: Class3/UCMM tag

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Class3/UCMM Tag)	—
Connection No.	001	—
Comment		—
Data Type	INT	—
Tag Name	Tag001	—
Tag Name Size	6	Characters
Size	1	—

Item	Description	Setting range
Connection Name	Displays the connection name.	—
Connection No.	Set the connection number. The default value is the minimum value from the unused connection numbers in the connection list.	1 to 64 ^{*1}
Comment	Set comments to the connection if required.	Up to 32 characters (one-byte or two-byte)
Data Type	Set the data type for the tag.	<ul style="list-style-type: none"> • INT (Default) • DINT
Tag Name	Set the tag name. The default name is set as "Tag" + the numerical value of the connection number. Tag names are not case-sensitive.	Up to 255 characters (one-byte only)
Tag Name Size	Displays the number of characters in the string displayed in "Tag Name". (Unit: characters)	—
Size	Set the size (the number of elements for INT/DINT type data). The size setting range depends on the setting of "Data Type".	<ul style="list-style-type: none"> • For INT: 1 to 249 • For DINT: 1 to 124

*1 When the maximum number of connections is set to 128, the setting range is from 1 to 128.

■Originator: Class1 instance communications

The following image shows an example of the window when an FX5-EIP connection is added as a target. The setting range varies depending on the EtherNet/IP device to be used. For details, refer to the manual for the external device.

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Exclusive Owner(Class1 Instance)	-
Application Type	Exclusive Owner	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Trigger Type	Cyclic	-
Inhibit Time Mode	Default	-
Inhibit Time	12	ms
Timeout Multiplier	x4	-
Configuration Instance	1	-
Input T->O		
Input Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	2	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	768	-
Output O->T		
Output Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	2	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	1024	-
Check Identity		
Compatible Mode	Disabled	-
Vendor Code Check	Disabled	-
Product Type Check	Disabled	-
Product Code Check	Disabled	-
Major Revision Check	Disabled	-
Minor Revision Check	Disabled	-

Item	Description	Setting range
Connection Name	Displays the connection name. The name of the connection selected in the connection selection window when adding the connection is displayed.	—
Application Type	Displays the application type. Any type in the setting range is displayed according to the selection of the connection selection window when adding the connection.	<ul style="list-style-type: none"> Input Only Exclusive Owner Listen Only
Connection No.	Set the connection number. The default value is the minimum value from the unused connection numbers in the connection list.	1 to 64 ^{*1}
Communication Method	Displays the communication method.	—
Comment	Set comments to the connection if required.	Up to 32 characters (one-byte or two-byte)
Trigger Type	Set the trigger type to be used in combination with "RPI" to control the timing of data transmission. For details on each trigger type, refer to the following. 📖 Page 28 Trigger type	<ul style="list-style-type: none"> Cyclic (Default) Change of State Application Trigger
Inhibit Time Mode	Set the mode of the transmission inhibit time (minimum delay time) until transmission. This item can be set only when "Trigger Type" is set to "Change of State" or "Application Trigger". <ul style="list-style-type: none"> Default: 1/4 of "RPI" of Output (O->T) is used as "Inhibit Time". However, if the value exceeds 255ms, 255ms is used. Un-Activated: 0ms is used as "Inhibit Time". Custom: Enter a value directly in "Inhibit Time". 	<ul style="list-style-type: none"> Default (Default) Un-Activated Custom
Inhibit Time	Set the transmission inhibit time (minimum delay time) until transmission. (Unit: ms) This item can be set only when "Inhibit Time Mode" is set to "Custom". If "Inhibit Time Mode" is set to "Default", automatic calculation will be performed.	1 to 255

Item		Description	Setting range
Timeout Multiplier		Set the timeout multiplier.	<ul style="list-style-type: none"> • ×4 (Default) • ×8 • ×16 • ×32 • ×64 • ×128 • ×256 • ×512
Configuration Instance		Obtains and displays the following values for the EDS file. <ul style="list-style-type: none"> • Connection Manager section • Connection entry • Path field 	—
Input T->O	Input Mode	Set the transmission mode for packets containing input data. <ul style="list-style-type: none"> • Multicast: Multicast (one to many) communications are performed. • Point to point: Unicast (one to one) communications are performed. 	<ul style="list-style-type: none"> • Multicast • Point to point
	Real Time Format	Displays the realtime format.	—
	Data Size	Set the data size to be transmitted from the target to the originator. (Unit: bytes)	1 to 1444 ^{*2}
	Priority	Set the priority of the connection.	<ul style="list-style-type: none"> • Low • High • Scheduled (Default) • Urgent
	RPI	Set the requested packet interval (RPI). (Unit: 500μs)	2000 to 60000000
	Instance ID	Set the instance ID.	0 to 65535
Output O->T	Output Mode	Displays the transmission mode for packets containing output data.	—
	Real Time Format	Displays the realtime format.	—
	Data Size	Set the data size to be transmitted from the originator to the target. (Unit: bytes) When "Real Time Format" is set to "Heartbeat", it is not necessary to set the data size.	1 to 1444 ^{*2}
	Priority	Set the priority of the connection.	<ul style="list-style-type: none"> • Low • High • Scheduled (Default) • Urgent
	RPI	Set the requested packet interval (RPI). (Unit: 1000μs)	2000 to 60000000
	Instance ID	Set the instance ID.	0 to 65535
Check Identity	Compatible Mode	Enables or disables compatible mode.	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Vendor Code Check	Set whether or not to check the vendor code. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Product Type Check	Set whether or not to check the product type. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Product Code Check	Set whether or not to check the product code. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Major Revision Check	Set whether or not to check the major revision. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Minor Revision Check	Set whether or not to check the minor revision. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled

*1 The setting range is from 1 to 128 when the maximum number of connections is set to 128. It does not depend on the EtherNet/IP devices to be used.

*2 The setting range is from 1 to 600 when the maximum number of connections is set to 128. However, it may differ depending on the EtherNet/IP device to be used.

■Originator: Class1 tag communications

The following image shows an example of the window when an FX5-EIP connection is added as a target. The setting range varies depending on the EtherNet/IP device to be used. For details, refer to the manual for the external device.

Item	Setting Value	Unit
Connection Name	Input Only(Class1 Tag)	-
Application Type	Input Only	-
Connection No.	001	-
Communication Method	Tag Communications	-
Comment		-
Tag Name	Tag001	-
Tag Name Size	6	Characters
Trigger Type	Cyclic	-
Inhibit Time Mode	Default	-
Inhibit Time	12	ms
Timeout Multiplier	x4	-
Input T->O		
Input Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	2	bytes
Priority	Scheduled	-
RPI	50000	us
Output O->T		
Output Mode	Point to point	-
Real Time Format	Heartbeat	-
Priority	Scheduled	-
RPI	50000	us
Check Identity		
Compatible Mode	Disabled	-
Vendor Code Check	Disabled	-
Product Type Check	Disabled	-
Product Code Check	Disabled	-
Major Revision Check	Disabled	-
Minor Revision Check	Disabled	-

Item	Description	Setting range
Connection Name	Displays the connection name.	—
Application Type	Displays the application type.	—
Connection No.	Set the connection number. The default value is the minimum value from the unused connection numbers in the connection list.	1 to 64 ^{*1}
Communication Method	Displays the communication method.	—
Comment	Set comments to the connection if required.	Up to 32 characters (one-byte or two-byte)
Tag Name	Set the tag name. The default name is set as "Tag" + the numerical value of the connection number. Tag names are not case-sensitive.	Up to 255 characters (one-byte only)
Tag Name Size	Displays the number of characters in the string displayed in "Tag Name". (Unit: characters)	—
Trigger Type	Set the trigger type to be used in combination with "RPI" to control the timing of data transmission. For details on each trigger type, refer to the following.  Page 28 Trigger type	<ul style="list-style-type: none"> • Cyclic (Default) • Change of State • Application Trigger
Inhibit Time Mode	Set the mode of the transmission inhibit time (minimum delay time) until transmission. This item can be set only when "Trigger Type" is set to "Change of State". <ul style="list-style-type: none"> • Default: 1/4 of "RPI" of Output (O->T) is used as "Inhibit Time". However, if the value exceeds 255ms, 255ms is used. • Un-Activated: 0ms is used as "Inhibit Time". • Custom: Enter a value directly in "Inhibit Time". 	<ul style="list-style-type: none"> • Default (Default) • Un-Activated • Custom
Inhibit Time	Set the transmission inhibit time (minimum delay time) until transmission. (Unit: ms) This item can be set only when "Inhibit Time Mode" is set to "Custom". If "Inhibit Time Mode" is set to "Default", automatic calculation will be performed.	1 to 255

Item		Description	Setting range
Timeout Multiplier		Set the timeout multiplier.	<ul style="list-style-type: none"> • ×4 (Default) • ×8 • ×16 • ×32 • ×64 • ×128 • ×256 • ×512
Input T->O	Input Mode	Set the transmission mode for packets containing input data. <ul style="list-style-type: none"> • Multicast: Multicast (one to many) communications are performed. • Point to point: Unicast (one to one) communications are performed. 	<ul style="list-style-type: none"> • Multicast • Point to point
	Real Time Format	Displays the realtime format.	—
	Data Size	Set the data size to be transmitted from the target to the originator. (Unit: bytes)	1 to 1444
	Priority	Set the priority of the connection.	<ul style="list-style-type: none"> • Low • High • Scheduled (Default) • Urgent
	RPI	Set the requested packet interval (RPI). (Unit: 500μs)	2000 to 60000000
Output O->T	Output Mode	Displays the transmission mode for packets containing output data.	—
	Real Time Format	Displays the realtime format.	—
	Priority	Set the priority of the connection.	<ul style="list-style-type: none"> • Low • High • Scheduled (Default) • Urgent
	RPI	Set the requested packet interval (RPI). (Unit: 500μs)	2000 to 60000000
Check Identity	Compatible Mode	Enables or disables compatible mode.	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Vendor Code Check	Set whether or not to check the vendor code. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Product Type Check	Set whether or not to check the product type. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Product Code Check	Set whether or not to check the product code. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Major Revision Check	Set whether or not to check the major revision. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled
	Minor Revision Check	Set whether or not to check the minor revision. This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled".	<ul style="list-style-type: none"> • Disabled (Default) • Enabled

*1 The setting range is from 1 to 128 when the maximum number of connections is set to 128. It does not depend on the EtherNet/IP devices to be used.

■Originator: Class3 instance communications

The following image shows an example of the window when an FX5-EIP connection is added as a target.

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Class3 Instance Communications)	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Service	0	-
Data Size	0	bytes
Large_Forward_Open	Use Automatically	-
Trigger Type	Cyclic	-
RPI	200000	us
Timeout Multiplier	×4	-
Class ID	0	-
Instance ID	0	-
Attribute ID	0	-

Item	Description	Setting range
Connection Name	Displays the connection name.	—
Connection No.	Set the connection number. The default value is the minimum value from the unused connection numbers in the connection list.	1 to 64*1
Communication Method	Displays the communication method.	—
Comment	Set comments to the connection if required.	Up to 32 characters (one-byte or two-byte)
Service	Set the service ID.	0 to 255
Data Size	Set the data size. (Unit: bytes)	0 to 1404
Large_Forward_Open	Set whether to use Large_Forward_Open. In the following cases, select "Use Always". <ul style="list-style-type: none"> Performing Class3 communications using Large_Forward_Open is required in the manual of the server device used. The size of response data from the server device is expected to be 512 bytes or larger. Responses from the server device are the following error codes. General Status: 23h CIP Status Name: Buffer Overflow 	<ul style="list-style-type: none"> Use Automatically (Default) Use Always
Trigger Type	Set the trigger type to be used in combination with "RPI" to control the timing of data transmission. <ul style="list-style-type: none"> Cyclic: Class3 messages are transmitted periodically according to "RPI". Application Trigger: Class3 messages are transmitted according to the request from the client (own station). 	<ul style="list-style-type: none"> Cyclic (Default) Application Trigger
RPI	Set the requested packet interval (RPI). (Unit: 1000μs)	200000 to 60000000
Timeout Multiplier	Set the timeout multiplier.	<ul style="list-style-type: none"> ×4 (Default) ×8 ×16 ×32 ×64 ×128 ×256 ×512
Class ID	Set the class ID.	0 to 65535
Instance ID	Set the instance ID.	0 to 65535
Attribute ID	Set the attribute ID.	0 to 65535

*1 The setting range is from 1 to 128 when the maximum number of connections is set to 128.

■Originator: Class3 tag communications

The following image shows an example of the window when an FX5-EIP connection is added as a target.

Connection Detailed Setting		
Item	Setting Value	Unit
Connection Name	Connection (Class3 Tag Communications)	-
Connection No.	001	-
Port	Not Used	-
Link Address	0	-
Communication Method	Tag Communications	-
Comment		-
Service	Read	-
Data Type	INT	-
Tag Name	Tag001	-
Tag Name Size	6	Characters
Size	1	-
Trigger Type	Cyclic	-
RPI	200000	us
Timeout Multiplier	x4	-

Item	Description	Setting range
Connection Name	Displays the connection name.	—
Connection No.	Set the connection number. The default value is the minimum value from the unused connection numbers in the connection list.	1 to 64 ^{*1}
Port	Set the port.	<ul style="list-style-type: none"> • Not Used (Default) • Backplane
Link Address	Set the link address.	0 (Default)
Communication Method	Displays the communication method.	—
Comment	Set comments to the connection if required.	Up to 32 characters (one-byte or two-byte)
Service	Set the service ID.	<ul style="list-style-type: none"> • Read (Default) • Write
Data Type	Set the data type for the tag.	<ul style="list-style-type: none"> • INT (Default) • DINT
Tag Name	Set the tag name. The default name is set as "Tag" + the numerical value of the connection number. Tag names are not case-sensitive.	Up to 255 characters (one-byte only)
Tag Name Size	Displays the number of characters in the string displayed in "Tag Name". (Unit: characters)	—
Size	Set the size (the number of elements for INT/DINT type data). The size setting range depends on the settings of "Data Type", "Service", and "Tag Name Size Characters".	<ul style="list-style-type: none"> • For INT: Read: 1 to 248 Write: 1 to 246— (number of tag name characters/2)^{*2} • For DINT: Read: 1 to 124 Write: 1 to 123— (number of tag name characters/2)^{*2}
Trigger Type	Set the trigger type to be used in combination with "RPI" to control the timing of data transmission. <ul style="list-style-type: none"> • Cyclic: Class3 messages are transmitted periodically according to "RPI". • Application Trigger: Class3 messages are transmitted according to the request from the client (own station). 	<ul style="list-style-type: none"> • Cyclic (Default) • Application Trigger
RPI	Set the requested packet interval (RPI). (Unit: 1000μs)	200000 to 60000000
Timeout Multiplier	Set the timeout multiplier.	<ul style="list-style-type: none"> • x4 (Default) • x8 • x16 • x32 • x64 • x128 • x256 • x512

*1 The setting range is from 1 to 128 when the maximum number of connections is set to 128.

*2 The value is rounded up to the nearest decimal point.

■Connection detail list

This tab displays the list of the details on each connection.

No.	Type	Comment	Model Name	Module Model Name	IP Address	Slot	Communication Type	Communication Method
001	Target		Own Node		192.168.3.251		Class1	Instance Communications
002	Tag		Own Node		192.168.3.251		Class3/UCMM	Instance Communications
003	Originator		FXS-EIP		192.168.3.1		Class1	Instance Communications
004	Originator		FXS-EIP		192.168.3.1		Class1	Tag Communications

No.	Item	Description
(1)	Item name	Sorts the connections in ascending/descending order for a target item. Dragging and dropping the item to the left or right changes the column order of the item. Items to be displayed or hidden can be selected from a right-click pop-up window. When "Others" is selected, the details of the items to be displayed can be set.
(2)	Filter conditions	Filters the connections to be displayed by entering characters. From a right-click pop-up window, the characters entered in the filter conditions can be copied or pasted, and the filter conditions can be deleted.
(3)	Connection	From a right-click pop-up window, the connections or filter conditions can be deleted or the connections can be copied as a text data.

■PPS List

This tab displays the communication processing performance (PPS) of each connection.

No.	Type	Communication Type	PPS	Comment
001	Target	Class1	-	
002	Tag	Class3/UCMM	-	
003	Originator	Class1	40.0	
004	Originator	Class1	40.0	

PPS [Packets Per Second]

The number of packets that can be processed in one second.
Set the total PPS so that it does not exceed the upper limit.
To maintain communication quality, it is recommended to set the PPS within 80% of the upper limit. Please refer to the manual for details.

$$PPS = (10^6 / RPI \text{ (Input T} \rightarrow \text{O)}) + (10^6 / RPI \text{ (Output O} \rightarrow \text{T)})$$

The total PPS value is calculated only for connections where "Type" is set to "Originator" and "Communication Type" is set to "Class1".
In addition to the PPS displayed in the total value, the PPS increases by the number of devices requesting connection for connections where "Type" is set to "Target" and "Tag".
Also, the PPS momentarily increases when making a transmission request for connections where "Communication Type" is set to "Class3", and when receiving a message for the server function of message communication.

Adjust the total value while checking "PPS List".

Communication processing performance (PPS) can be adjusted by changing the requested packet interval (RPI).

To maintain communication quality, setting a value that ensure sufficient allowance to the total communication processing performance (PPS) is recommended. (☞ Page 17 Performance Specifications)

Point

Right-click a connection with PPS displayed, and from the pop-up window, select [Move to RPI (Input (T→O))] or [Move to RPI (Output (O→T))] to move to the applicable location of the detailed connection settings.

Configuration Setting

The configuration can be set in the connection detailed setting depending on the devices.

Operating procedure

1. Set "Configuration Availability" to "Enabled". (Default: Enabled)

Item	Setting Value	Unit
Configuration Availability	Enabled	-
Configuration Setting	<Detailed Setting>	-

2. Double-click <Detailed Setting> in the "Configuration Setting" to display the configuration setting window.

[illegible]

3. Click the [...] button on the right of the setting value to set the element value.

Setting Value: 00

Element Name	Element Value
[Bit0]	0
[Bit1]	0
[Bit2]	0
[Bit3]	0
[Bit4]	0
[Bit5]	0
[Bit6]	0
[Bit7]	0

Explanation:

Restore the Default Settings

OK Cancel



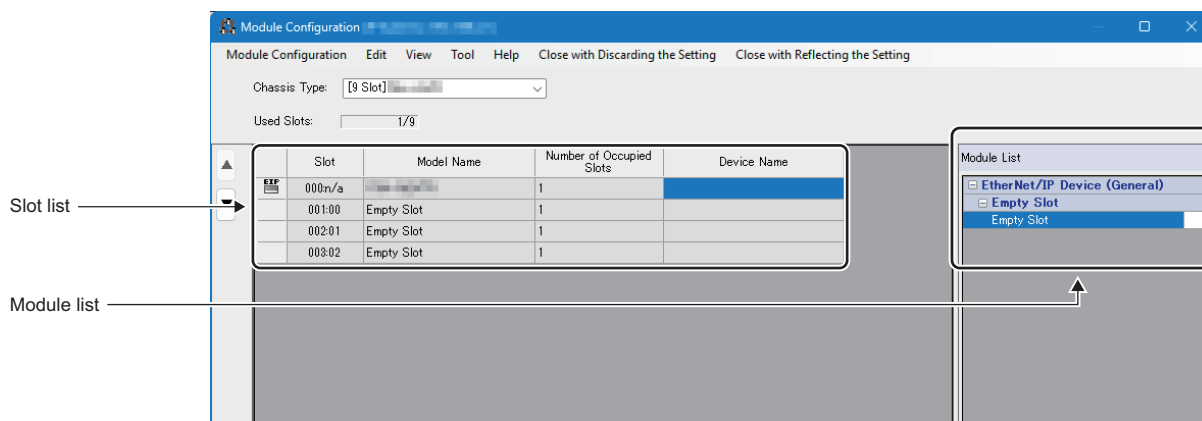
The displayed contents vary depending on the EDS files.

Module Configuration setting

Set the module for EtherNet/IP communications.

Operating procedure

1. Under "Chassis Type", select the chassis to be set. As the number of slots is indicated on the chassis, please select the type according to the number of modules to be added.
2. Select the module to be added from "Module List" and drag it to the list of slots.



3. Check the system configuration.

[Module Configuration] ⇒ [Check] ⇒ [System Configuration]

4. Click [Close with Reflecting the Setting] to close the "Module Configuration" window.

Setting items

Item	Description	Setting range
Chassis Type	Changes the chassis type to be used for the module.	—
Number of Used Slots	Displays the number of slots to be used for the module.	—
Slot	Displays the slot number of the module.	—
Model Name	Displays the model name of the module.	—
Number of Occupied Slots	Displays the number of occupied slots for the selected slot.	—
Device Name	Enter the name of the device for the selected slot if required.	Up to 32 characters (one-byte or two-byte)

Point

When a module is added to the slot list, the registration of some EDS files may be required for the module. If the registration of the EDS file is not satisfied, the module cannot be added to the slot list. Check the source of the EDS files to be downloaded, register the necessary EDS files.

Adding/deleting the EDS file

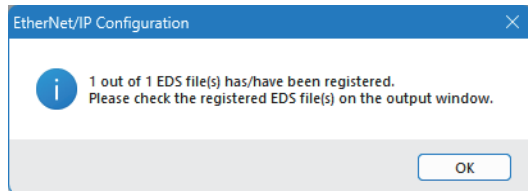
■ Adding the EDS file

Register the EDS file (profile) of the EtherNet/IP device to be set in the following procedure.

1. Select the EDS file to be registered from the following window in the "EtherNet/IP Configuration" window, and click the [Open] button.

 [Tool] ⇒ [EDS File Management] ⇒ [Register]

2. The registration is completed when the following window appears.



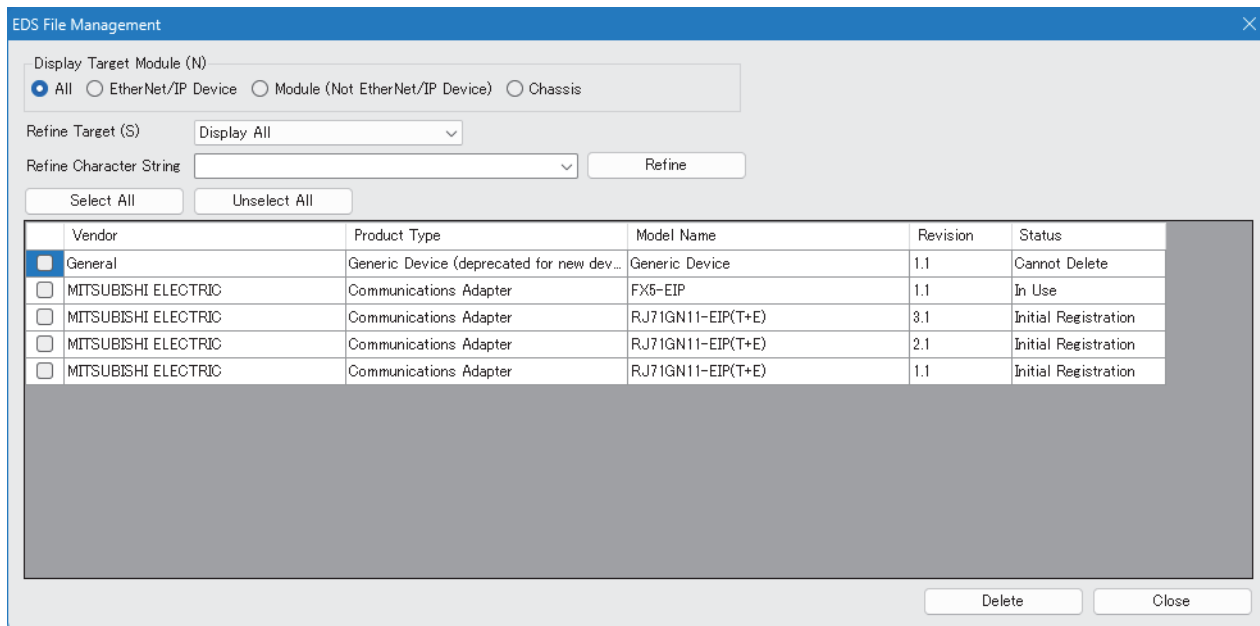
Point

EDS files that are not created according to the EtherNet/IP specifications may not be added to the EtherNet/IP configuration.

■Deleting the EDS file

The registered EDS file (profile) can be deleted from the following window in the "EtherNet/IP Configuration" window.

 [Tool] ⇒ [EDS File Management] ⇒ [Management]



Vendor	Product Type	Model Name	Revision	Status
☒ General	Generic Device (deprecated for new dev...	Generic Device	1.1	Cannot Delete
☐ MITSUBISHI ELECTRIC	Communications Adapter	FX5-EIP	1.1	In Use
☐ MITSUBISHI ELECTRIC	Communications Adapter	RJ71GN11-EIP(T+E)	3.1	Initial Registration
☐ MITSUBISHI ELECTRIC	Communications Adapter	RJ71GN11-EIP(T+E)	2.1	Initial Registration
☐ MITSUBISHI ELECTRIC	Communications Adapter	RJ71GN11-EIP(T+E)	1.1	Initial Registration

An EDS file (profile) can be deleted by selecting the checkbox on the left side of its field and clicking the [Remove] button.

Displayed items

The display items in "Status" are shown below.

Status	Description
Initial Registration	An EDS file to be registered at installation If the EDS file is deleted, the created EtherNet/IP Configuration tool may not be opened properly.
Cannot Delete	An EDS file which cannot be deleted from EtherNet/IP Configuration tool
In Use	An EDS file which is currently being used in EtherNet/IP Configuration tool. The file cannot be deleted.
Deleting Completed	A deleted EDS file This status is displayed when a file deletion is completed.
Deleting Failed	An EDS file which failed to be deleted This status is displayed when a file deletion fails even though the file deletion is attempted.



If an EDS file with "Initial Registration" status is deleted, and the EDS file will be used again, please download the EDS file from Mitsubishi Electric FA Global Site.

www.MitsubishiElectric.com/fa

8 PROGRAMMING

8.1 Precautions for Programming

This section describes precautions when creating EtherNet/IP communications programs.

Refresh settings

Do not use "M+FX5-EIP_Class1SetOutputData" in the program for connections in which cyclic communications are specified in the refresh settings under parameters in the engineering tool.

The refresh may lead to transmit data inconsistencies between the output data to be transmitted and the output data set in the module function block.

For an example program that does not use "M+FX5-EIP_Class1SetOutputData", refer to the following.

 Page 145 Target 2-side program

Buffer memory settings

"Data area" of the buffer memory, which is used in EtherNet/IP communications, is shared by cyclic communications and message communications, and the area is divided by connection number. To acquire the buffer memory start address and data area size of the data area corresponding to the connection number, calculate them from values stored in the following buffer memory areas.

Data to acquire	Data acquisition source buffer memory address
Input data size	Un\G304 to Un\G431: Input data size Values are stored in order, starting from connection number 1.
<ul style="list-style-type: none">• Output data size• Message communication (server) data size	Un\G432 to Un\G559: Output/message communication (server) data size Values are stored in order, starting from connection number 1.
Input data buffer memory address	Un\G560 to Un\G815: Input data buffer memory address Values are stored in order, starting from connection number 1. The buffer memory address of the corresponding connection number in the input data area is stored as is.
<ul style="list-style-type: none">• Output data buffer memory address• Message communication (server) data buffer memory address	Un\G816 to Un\G1071: Output/message communication (server) data buffer memory address Values are stored in order, starting from connection number 1. The buffer memory address of the corresponding connection number in the output/message communication (server) data area is stored as is.

Point

The buffer memory start addresses of "Input data area" and "Output/message communication (server) data area" change according to the maximum number of connections.

For differences in buffer memory layout depending on the maximum number of connections setting, refer to the following.

 Page 225 List of buffer memory addresses

The acquisition method is the same regardless of the maximum number of connections setting.

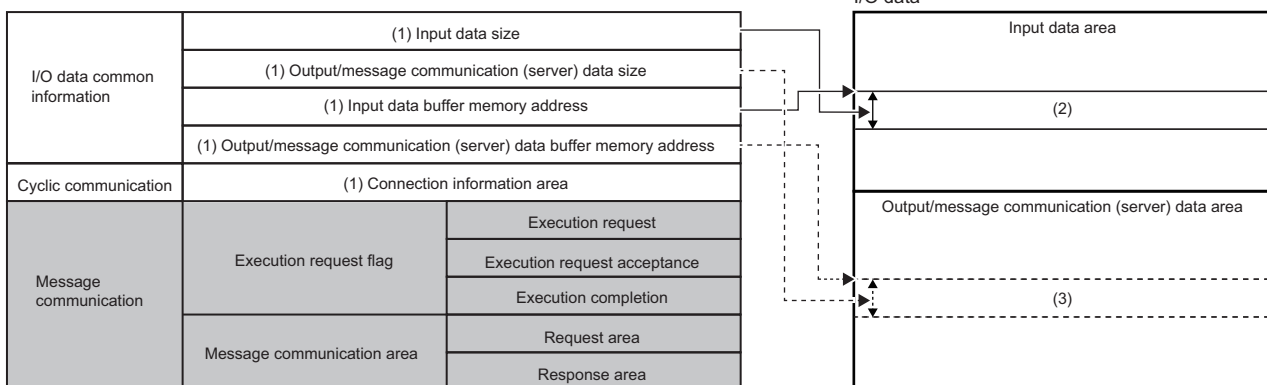
Example of using buffer memory areas

Regarding "Data area" of the buffer memory, which is used in EtherNet/IP communications, a different area is used depending on the communication function. This section shows examples of using major buffer memory areas with each function listed below.

Function	FX5-EIP	Reference
Class1 instance communications	Originator, target	☞ Page 125 For Class1 instance communications (originator, target) (Exclusive Owner)
Class1 tag communications	Originator	☞ Page 126 For Class1 tag communications (originator) (Input Only)
	Target	☞ Page 126 For Class1 tag communications (target) (Input Only)
Class3 instance communications	Client	☞ Page 127 For Class3 instance communications (client)
Class3 tag communications	Client (Read)	☞ Page 127 For Class3 tag communications (client) (Read)
	Client (Write)	☞ Page 128 For Class3 tag communications (client) (Write)
UCMM instance communications	Client	☞ Page 129 For UCMM instance communications (client)
UCMM tag communications	Client (Read)	☞ Page 130 For UCMM tag communications (client) (Read)
	Client (Write)	☞ Page 131 For UCMM tag communications (client) (Write)
Class3/UCMM tag communications	Server	☞ Page 132 For Class3/UCMM tag communications (server)

For Class1 instance communications (originator, target) (Exclusive Owner)

Connection settings



(1) Area where the parameter settings are automatically set

(2) Area where data received from the communication destination is stored

(3) Area to be set by the user in the program

Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- The input data transmitted from the external device is stored in the input data area.
- When output data is written to the output/message communication (server) data area, it is transmitted to the external device by RPI cycle.

Point

- When the application type for Class1 instance communications (originator) is set to Input Only, output/message communication (server) data is not used. In this case, 0 is stored in the output/request data size.
- When the application type for Class1 instance communications (target) is set to Input Only, input data is not used. In this case, 0 is stored in the input data size.

For Class1 tag communications (originator) (Input Only)

Connection settings

I/O data common information	(1) Input data size	
	Output/message communication (server) data size	
	(1) Input data buffer memory address	
	Output/message communication (server) data buffer memory address	
Cyclic communication	(1) Connection information area	
Message communication	Message communication execution command	Execution request
		Execution request acceptance
		Execution completion
	Message communication area	Request area
		Response area

I/O data

Input data area
(2)
Output/message communication (server) data area

(1) Area where the parameter settings are automatically set

(2) Area where data received from the communication destination is stored

Colored areas are not used.

- In areas where the parameter settings are automatically set, the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- Input data transmitted from the target is stored in the input data area.

Point

In Class1 tag communications (originator), output/message communication (server) data is not used. Therefore, 0 is stored in the output/message communication (server) data size.

For Class1 tag communications (target) (Input Only)

Connection settings

I/O data common information	Input data size	
	(1) Output/message communication (server) data size	
	Input data buffer memory address	
	(1) Output/message communication (server) data buffer memory address	
Cyclic communication	(1) Connection information area	
Message communication	Message communication execution command	Execution request
		Execution request acceptance
		Execution completion
	Message communication area	Request area
		Response area

I/O data

Input data area
Output/message communication (server) data area
(2)

(1) Area where the parameter settings are automatically set

(2) Area to be set by the user in the program

Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- When output data is written to the output/message communication (server) data area, it is transmitted to the originator by RPI cycle.

Point

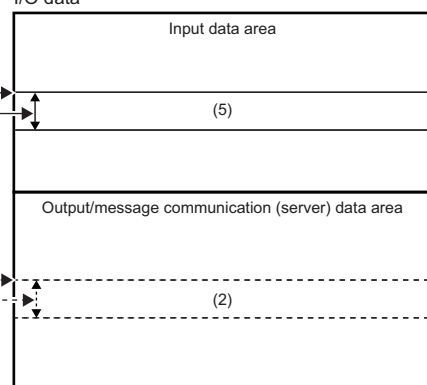
In Class1 tag communications (target), input data is not used. Therefore, 0 is stored in the input data size.

For Class3 instance communications (client)

Connection settings

I/O data common information	(5) Input data size	
	(1) Output/message communication (server) data size	
	(1) Input data buffer memory address	
	(1) Output/message communication (server) data buffer memory address	
Cyclic communication	Connection information area	
Message communication	Message communication execution command	(3) Execution request
		(4) Execution request acceptance
		(4) Execution completion
	Message communication area	(1) Request area
		(5) Response area

I/O data



- (1) Area where the parameter settings are automatically set
 (2)(3)Area to be set by the user in the program
 (4) Area where the operating status is automatically updated
 (5) Area where data received from the communication destination is stored
 Colored areas are not used.

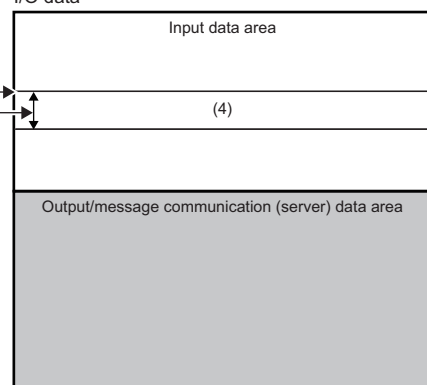
- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- If necessary, data to be transmitted to the server is written to the output/message communication (server) data area.
- When the execution request is turned on in a program, communications start and execution request acceptance turns on.
- When a response is received from the server, execution completion turns on.
- Responses such as processing results are stored in the response area, the size of received data is stored in the input data size, and the received data is stored in the input data area.

For Class3 tag communications (client) (Read)

Connection settings

I/O data common information	(4) Input data size	
	(1) Output/message communication (server) data size	
	(1) Input data buffer memory address	
	Output/message communication (server) data buffer memory address	
Cyclic communication	Connection information area	
Message communication	Message communication execution command	(2) Execution request
		(3) Execution request acceptance
		(3) Execution completion
	Message communication area	(1) Request area
		(4) Response area

I/O data



- (1) Area where the parameter settings are automatically set
 (2) Area to be set by the user in the program
 (3) Area where the operating status is automatically updated
 (4) Area where data received from the communication destination is stored
 Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- When the execution request is turned on in a program, communications start and execution request acceptance turns on.
- When a response is received from the server, execution completion turns on.
- Responses such as processing results are stored in the response area, the size of received data is stored in the input data size, and the received data is stored in the input data area.



The output/message communication (server) data size stores the size of data to be read.

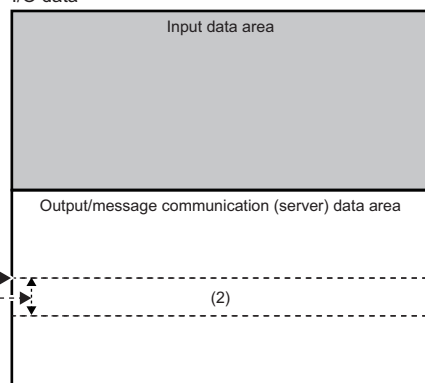
For Class3 tag communications (client) (Write)

■For Class3 tag communications (client) (Write)

Connection settings

I/O data common information	Input data size	
	(1) Output/message communication (server) data size	
	Input data buffer memory address	
	(1) Output/message communication (server) data buffer memory address	
Cyclic communication	Connection information area	
Message communication	Message communication execution command	(3) Execution request
		(4) Execution request acceptance
		(4) Execution completion
	Message communication area	(1) Request area
		(5) Response area

I/O data



(1) Area where the parameter settings are automatically set

(2)(3)Area to be set by the user in the program

(4) Area where the operating status is automatically updated

(5) Area where data received from the communication destination is stored

Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- Data to be transmitted to the server is written to the output/message communication (server) data area.
- When the execution request is turned on in a program, communications start and execution request acceptance turns on.
- When a response is received from the server, execution completion turns on.
- Responses such as processing results are stored in the response area.

For UCMM instance communications (client)

Connection settings

I/O data common information	(6) Input data size	
	(3) Output/message communication (server) data size	
	(1) Input data buffer memory address	
	(1) Output/message communication (server) data buffer memory address	
Cyclic communication	Connection information area	
Message communication	Message communication execution command	(4) Execution request
		(5) Execution request acceptance
		(5) Execution completion
	Message communication area	(2) Request area
		(6) Response area

I/O data

Input data area	
(6)	
Output/message communication (server) data area	
(3)	

- (1) Area where the parameter settings are automatically set
 (2)(3)(4)Area to be set by the user in the program
 (5) Area where the operating status is automatically updated
 (6) Area where data received from the communication destination is stored
 Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- Request information, such as the transmission destination, is written to area (2).
- If necessary, the data size of data to be transmitted to the server is written to the output/message communication (server) data size, and the data is written to the output/message communication (server) data area.
- When the execution request is turned on in a program, communications start and execution request acceptance turns on.
- When a response is received from the server, execution completion turns on.
- Responses such as processing results are stored in the response area, the size of received data is stored in the input data size, and the received data is stored in the input data area.

Point

At startup, the FX5-EIP automatically stores 0001H only for the communication type specification in the request area. Connections with the communication type specification set to 0001H can be used in the UCMM client function.

For UCMM tag communications (client) (Read)

Connection settings

I/O data common information	(6) Input data size	
	(3) Output/message communication (server) data size	
	(1) Input data buffer memory address	
	(1) Output/message communication (server) data buffer memory address	
Cyclic communication	Connection information area	
Message communication	Message communication execution command	(4) Execution request
		(5) Execution request acceptance
		(5) Execution completion
	Message communication area	(2) Request area
		(6) Response area

I/O data

Input data area	
(6)	
Output/message communication (server) data area	
(3)	

(1) Area where the parameter settings are automatically set

(2)(3)(4)Area to be set by the user in the program

(5) Area where the operating status is automatically updated

(6) Area where data received from the communication destination is stored

Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- The size of data to be read is written to the output/message communication (server) data size, and request information such as the transmission destination is written to the request areas.
- When the execution request is turned on in a program, communications start and execution request acceptance turns on.
- When a response is received from the server, execution completion turns on.
- Responses such as processing results are stored in the response area, the size of received data is stored in the input data size, and the received data is stored in the input data area.

Point

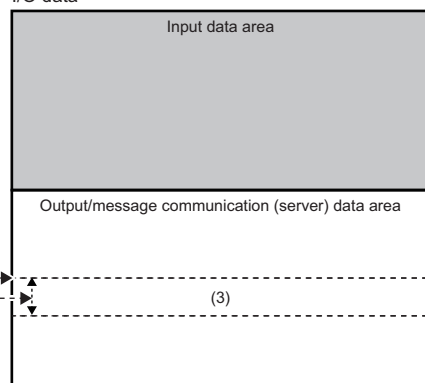
At startup, the FX5-EIP automatically stores 0001H only for the communication type specification in the request area. Connections with the communication type specification set to 0001H can be used in the UCMM client function.

For UCMM tag communications (client) (Write)

Connection settings

I/O data common information	Input data size	
	(3) Output/message communication (server) data size	
	Input data buffer memory address	
	(1) Output/message communication (server) data buffer memory address	
Cyclic communication	Connection information area	
Message communication	Message communication execution command	(4) Execution request
		(5) Execution request acceptance
		(5) Execution completion
	Message communication area	(2) Request area
		(6) Response area

I/O data



(1) Area where the parameter settings are automatically set

(2)(3)(4)Area to be set by the user in the program

(5) Area where the operating status is automatically updated

(6) Area where data received from the communication destination is stored

Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- Request information such as the transmission destination is written to the request areas.
- The size of data to be transmitted to the server is written to the output/message communication (server) data size, and the data is written to the output/message communication (server) data area.
- When the execution request is turned on in a program, communications start and execution request acceptance turns on.
- When a response is received from the server, execution completion turns on.
- Responses such as processing results are stored in the response area.

8

Point

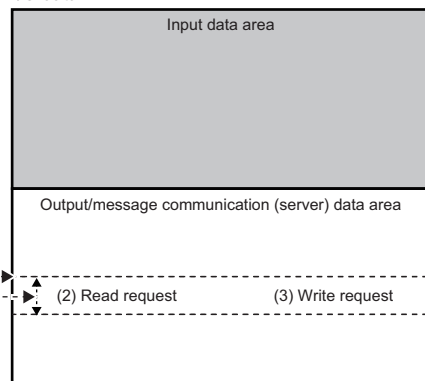
At startup, the FX5-EIP automatically stores 0001H only for the communication type specification in the request area. Connections with the communication type specification set to 0001H can be used in the UCMM client function.

For Class3/UCMM tag communications (server)

Connection settings

I/O data common information	Input data size	
	(1) Output/message communication (server) data size	
	Input data buffer memory address	
	(1) Output/message communication (server) data buffer memory address	
Cyclic communication	Connection information area	
Message communication	Message communication execution command	Execution request
		Execution request acceptance
		Execution completion
	Message communication area	Request area
		Response area

I/O data



(1) Area where the parameter settings are automatically set

(2) Area to be set by the user in the program

(3) Area where data received from the communication destination is stored

Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- When a Read request is received from the client, the data written to the output/message communication (server) data area is transmitted to the client.
- When a Write request is received from the client, the data received from the client is stored in the output/message communication (server) data area.

Point

Read and Write requests for the same tag share the output/message communication (server) data area.

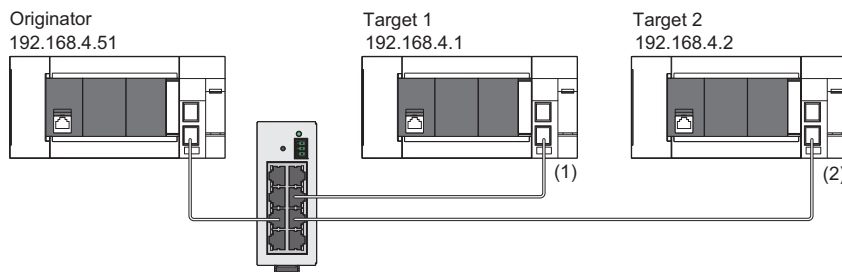
8.2 Example of Cyclic Communications

This section describes examples of executing cyclic communications between FX5-EIP modules.

System configuration

The following system configuration is used for examples of Class1 instance communications and Class1 tag communications.

"Maximum Number of Connections Setting" of each FX5-EIP is assumed to be set to 64.



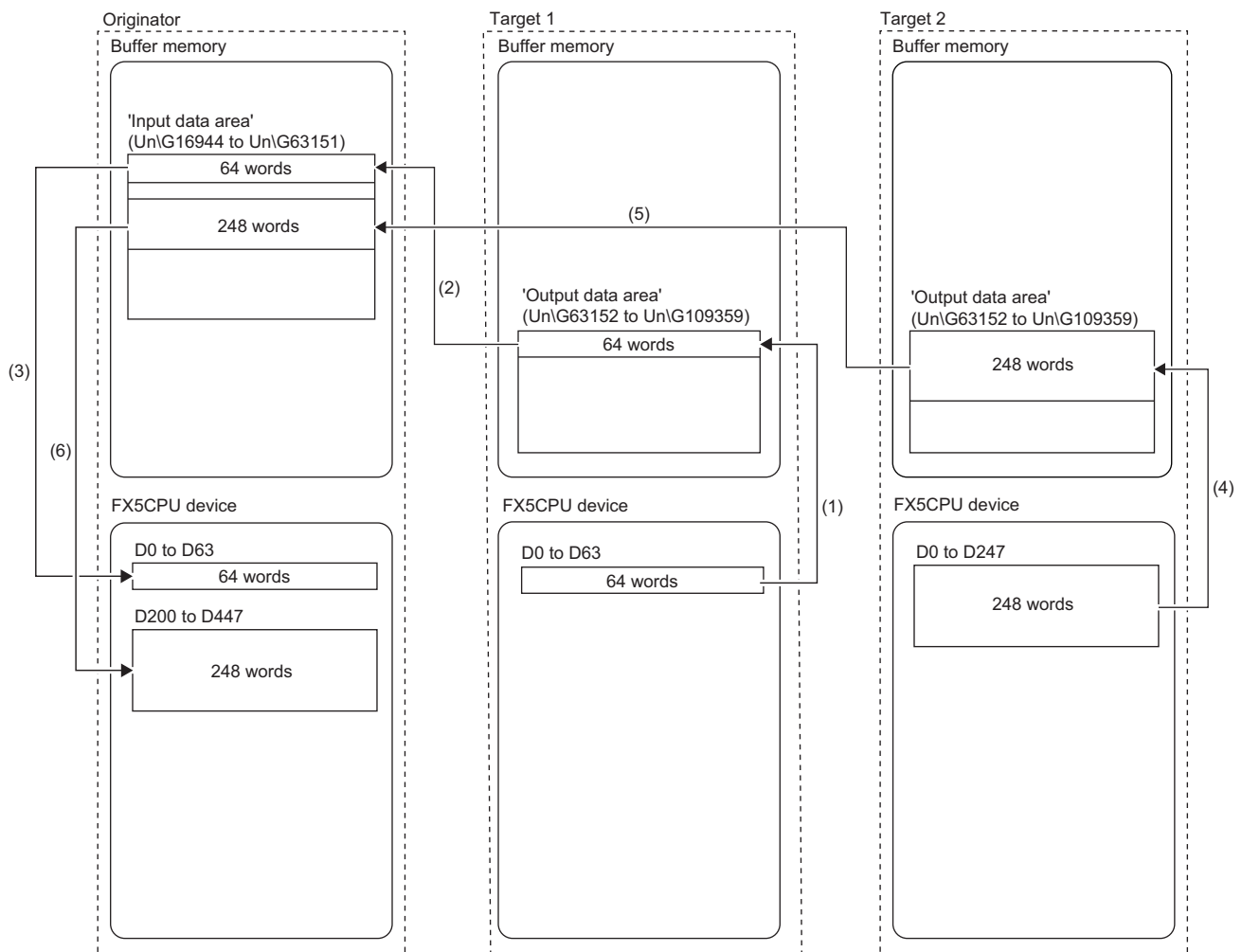
(1) Class1 instance communications between the originator and target 1

(2) Class1 tag communications between the originator and target 2

Communication description

The following figure shows the relationships between the FX5-EIP buffer memory areas and each target.

- The originator and target 1 use function blocks for instance communications.
- The originator and target 2 use auto refresh for tag communications.



- (1) Transfer data from the CPU module to the output data area by using function blocks.
- (2) Instance communications
- (3) Transfer data from the input data area to the CPU module by using function blocks.
- (4) Auto refresh from the CPU module to the output data area
- (5) Tag communications
- (6) Auto refresh from the input data area to the CPU module

Parameter settings

Use the engineering tool to set the parameters.

Point

In the program examples, default values are used for settings other than parameters shown in the setting procedure. For the parameters, refer to the following.

☞ Page 89 PARAMETER SETTINGS

FX5-EIP (originator) settings

Connect the engineering tool to the originator-side CPU module and set the parameters.

1. Set the IP address.

☞ Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 4 . 51
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.4.51

Subnet mask: 255.255.255.0

2. Set the auto refresh.

☞ Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings] ⇒ [Refresh Settings] ⇒ <Detailed Setting>

Setting Item

Target

Device



Transfer to Network Module

Transfer to CPU Module

Item	Setting					
	CPU Side					
	Auto-refresh	Device Name	Points	Start	End	
Transfer the data of the specified device to buffer memory						
Transfer to Network Module						
..... Connection No.1	 Disable					
..... Connection No.2	 Enable	D	248	200	447	
..... Connection No.3	 Disable					
..... Connection No.4	 Disable					
..... Connection No.5	 Disable					
..... Connection No.6	 Disable					
..... Connection No.7	 Disable					
..... Connection No.8	 Disable					
..... Connection No.9	 Disable					
..... Connection No.10	 Disable					

■ Transfer to the CPU module

• Connection number 2: D200 to D447

Point

When "Auto-refresh Batch Setting" and "Points Batch Setting" are used, connections must be set in "EtherNet/IP Configuration" in advance.

3. Click the [Apply] button.

4. Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

5. From "Module List", add "FX5-EIP" to the list of EtherNet/IP devices.

EtherNet/IP Configuration (Mounting position No.: 1[U1])

EtherNet/IP Configuration Edit View Tool Help Close with Discarding the Setting Close with Reflecting the Setting

Detect Now

No.	Model Name	Device Name	IP Address	Reserved Node	Connection Setting	Module Configuration Setting	Used Slots
	Own Node		192.168.4.51		<Detailed Setting>		
1	FX5-EIP		192.168.4.1	No Setting	<Detailed Setting>		
2	FX5-EIP		192.168.4.2	No Setting	<Detailed Setting>		

192.168.4.51 192.168.4.1 192.168.4.2

Own Node
Total Number of Nodes: 2/64

FX5-EIP FX5-EIP

Module List

- EtherNet/IP Device (General)
 - EtherNet/IP Device (MITSUBISHI E...
 - Communications Adapter
 - FX5-EIP 1.1
 - RJ71GN11-EIP(T+E) 3.1
 - RJ71GN11-EIP(T+E) 2.1
 - RJ71GN11-EIP(T+E) 1.1

[Vendor]
MITSUBISHI ELECTRIC

[Product Type]
Communications Adapter

[Model]
FX5-EIP

[Revision]
DeviceRevision: 1.1
FileRevision: 1.1



If "FX5-EIP" is not shown in the "Module List", the EDS file needs to be added.

For adding the EDS file, refer to the following.

➞ Page 122 Adding/deleting the EDS file

6. Double-click <Detailed Setting> in the "Connection Setting" column and set the connections for target 1 and target 2.

- Instance communication settings for target 1

Connection Setting

Connection Information Number of Connections: 1/64 PPS: 40

Connection List

Module Order Connection Detail List PPS List

Own Node

- Target
- Tae
- Originator
- FX5-EIP(192.168.4.1)
- (001)
- FX5-EIP(192.168.4.2)

Add Connection Delete Connection

Connection Detailed Setting

Item	Setting Value	Unit
Connection Name	Input Only(Class1 Instance)	-
Application Type	Input Only	-
Connection No.	001	-
Communication Method	Instance Communications	-
Comment		-
Trigger Type	Cyclic	-
Inhibit Time Mode	Default	-
Inhibit Time	12	ms
Timeout Multiplier	x4	-
Configuration Instance	1	-
Input T->O		
Input Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	128	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	768	-
Output O->T		
Output Mode	Point to point	-
Real Time Format	Heartbeat	-
Data Size	0	bytes
Priority	Scheduled	-
RPI	50000	us
Instance ID	254	-
Check Identity		
Compatible Mode	Disabled	-
Vendor Code Check	Disabled	-
Product Type Check	Disabled	-
Product Code Check	Disabled	-
Major Revision Check	Disabled	-
Minor Revision Check	Disabled	-
Explanation		
Connection Name		
Restore the Default Settings		

Error:0 Warning:0 Information:0

OK Cancel Apply

- When adding a connection, select [Input Only(Class1 Instance)].
- Instance ID of Input T->O: 768 (Set the instance ID of the communication target connection set as target 1.)
- Data size of Input T->O: 128 (Set the data size of the communication target connection set as target 1.)

- Tag communication settings for target 2

Connection Setting

Connection Information Number of Connections: 2/64 PPS: 80

Connection List

Module Order Connection Detail List PPS List

Own Node

- Target
- Originator
 - FX5-EIP(192.168.4.1) (001)
 - FX5-EIP(192.168.4.2) (002)

Add Connection Delete Connection

Connection Detailed Setting

Item	Setting Value	Unit
Connection Name	Input Only(Class 1 Tag)	-
Application Type	Input Only	-
Connection No.	002	-
Communication Method	Tag Communications	-
Comment		-
Tag Name	Tag002	-
Tag Name Size	6	Characters
Trigger Type	Cyclic	-
Inhibit Time Mode	Default	-
Inhibit Time	12	ms
Timeout Multiplier	x4	-
Input T->O		
Input Mode	Point to point	-
Real Time Format	Modeless	-
Data Size	496	bytes
Priority	Scheduled	-
RPI	50000	us
Output O->T		
Output Mode	Point to point	-
Real Time Format	Heartbeat	-
Priority	Scheduled	-
RPI	50000	us
Check Identity		
Compatible Mode	Disabled	-
Vendor Code Check	Disabled	-
Product Type Check	Disabled	-
Product Code Check	Disabled	-
Major Revision Check	Disabled	-
Minor Revision Check	Disabled	-
Explanation		
Restore the Default Settings		

Error:0 Warning:0 Information:0

OK Cancel Apply

- When adding a connection, select [Input Only(Class 1 Tag)].
- Tag name of Input T->O: Tag001 (Set the tag name of the communication target connection set as target 2.)
- Data size of Input T->O: 496 (Set the data size of the communication target connection set as target 2.)

7. Click the [Apply] button.

8. Click the [OK] button to close the connection settings.

9. Select [Close with Reflecting the Setting] and close the "Ethernet/IP Configuration" window.

10. Write the set parameters to the originator-side CPU module. Then reset the CPU module or power off and on the system.

[Online] ⇌ [Write to PLC]

FX5-EIP (target 1) settings

Connect the engineering tool to the target 1-side CPU module and set the parameters.

1. Set the IP address.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 4 . 1
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	.
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.4.1

Subnet mask: 255.255.255.0

2. Click the [Apply] button.

3. Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

4. Double-click <Detailed Setting> in the "Connection Setting" column and set the connection.

- When adding a connection, select [Connection (Target Instance Communications)].
- Instance ID: 768
- Data size: 128

5. Click the [Apply] button.

6. Click the [OK] button to close the connection settings.

7. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

8. Write the set parameters to the originator-side CPU module. Then reset the CPU module or power off and on the system.

 [Online] ⇒ [Write to PLC]

FX5-EIP (target 2) settings

Connect the engineering tool to the target 2-side CPU module and set the parameters.

1. Set the IP address.

 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 4 . 2
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	.
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.4.2

Subnet mask: 255.255.255.0

2. Set the auto refresh.

 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings] ⇒ [Refresh Settings] ⇒ <Detailed Setting>

Setting Item	
Target	Device
Transfer to Network Module Transfer to CPU Module	
Item	Setting
CPU Side	
	Auto-refresh Device Name Points Start End
Transfer the data of the specified device to buffer memory	
Transfer to Network Module	Enable D 248 0 247
Connection No.1	Disable
Connection No.2	Disable
Connection No.3	Disable
Connection No.4	Disable
Connection No.5	Disable
Connection No.6	Disable
Connection No.7	Disable
Connection No.8	Disable
Connection No.9	Disable
Connection No.10	Disable

■ Transfer to the network module

- Connection number 1: D0 to D247

Point

When "Auto-refresh Batch Setting" and "Points Batch Setting" are used, connections must be set in "EtherNet/IP Configuration" in advance.

3. Click the [Apply] button.
4. Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

 [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

5. Double-click <Detailed Setting> in the "Connection Setting" column and set the connection.

Connection Setting

Connection Information Number of Connections: 1/64 PPS: 0

Connection List

Module Order Connection Detail List PPS List

Own Node

- Target
- Tag (001)
- Tag
- Originator

Add Connection Delete Connection

Connection Detailed Setting

Item	Setting Value	Unit
Connection Name	Connection (Target Tag Communications)	-
Application Type	Input Only	-
Connection No.	001	-
Communication Method	Tag Communications	-
Comment		-
Tag Name	Tag001	-
Tag Name Size	6	Characters
Data Size	496	bytes

Explanation

Connection Name

Restore the Default Settings

Error:0 Warning:0 Information:0

OK Cancel Apply

- When adding a connection, select [Connection (Target Tag Communications)].
- Tag name: Tag001
- Data size: 496

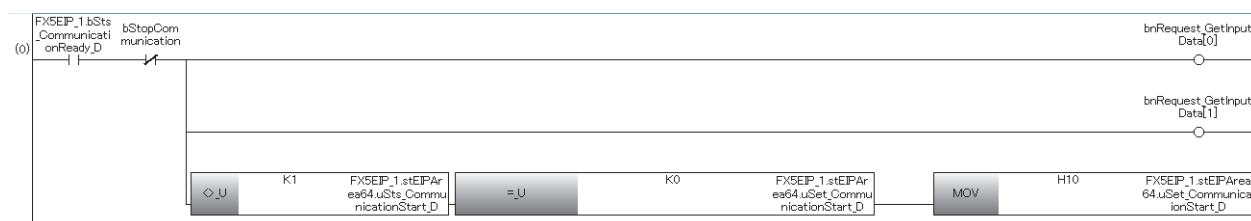
6. Click the [Apply] button.
 7. Click the [OK] button to close the connection settings.
 8. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.
 9. Write the set parameters to the originator-side CPU module. Then reset the CPU module or power off and on the system.
- [Online] ⇒ [Write to PLC]

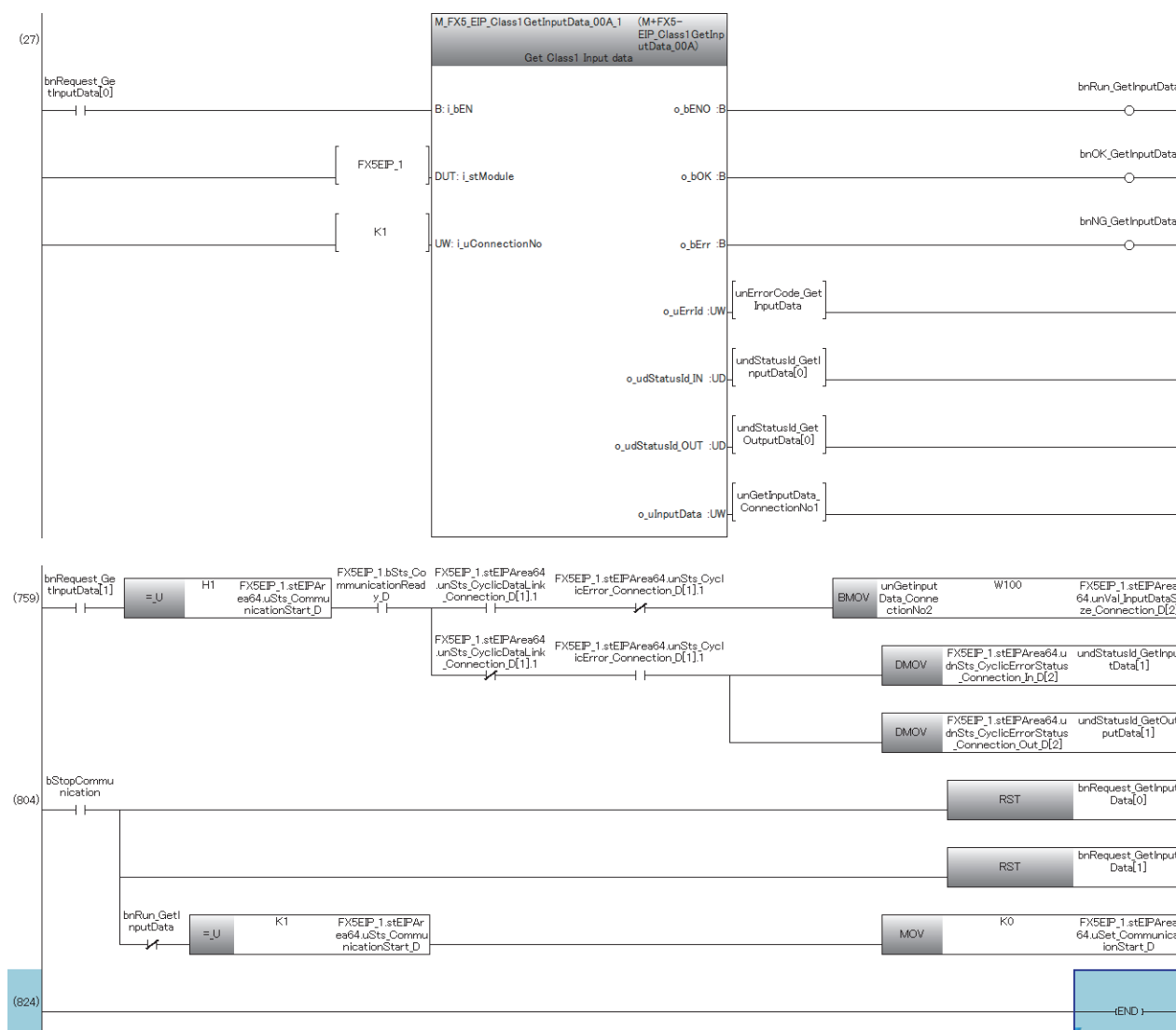
Program example

The following shows program examples that start I/O data communication in cyclic communication.

Originator-side program

Classification	Label name	Description	Device																																																																		
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																																																																		
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																																																																		
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																																																																		
	FX5EIP_1.stEIPArea64.unVal_InputDataSize_Connection_D[2]	Input data size	U1\G305																																																																		
	FX5EIP_1.stEIPArea64.unSts_CyclicDataLink_Connection_D[1].1	Cyclic communication data link status	U1\G1328.1																																																																		
	FX5EIP_1.stEIPArea64.unSts_CyclicError_Connection_D[1].1	Cyclic communication error status	U1\G1336.1																																																																		
	FX5EIP_1.stEIPArea64.udnSts_CyclicErrorStatus_Connection_In_D[2]	Cyclic communication input error status	U1\G1394																																																																		
	FX5EIP_1.stEIPArea64.udnSts_CyclicErrorStatus_Connection_Out_D[2]	Cyclic communication output error status	U1\G1650																																																																		
Label to be defined	Define global labels as shown below. <table><thead><tr><th></th><th>Label Name</th><th>Data Type</th><th></th><th>Class</th><th>Assign (Device/Label)</th></tr></thead><tbody><tr><td>1</td><td>bnRequest_GetInputData</td><td>Bit(0.1)</td><td>...</td><td>VAR_GLOBAL</td><td>M0</td></tr><tr><td>2</td><td>bnRun_GetInputData</td><td>Bit</td><td>...</td><td>VAR_GLOBAL</td><td>M10</td></tr><tr><td>3</td><td>bnOK_GetInputData</td><td>Bit</td><td>...</td><td>VAR_GLOBAL</td><td>M20</td></tr><tr><td>4</td><td>bnNG_GetInputData</td><td>Bit</td><td>...</td><td>VAR_GLOBAL</td><td>M30</td></tr><tr><td>5</td><td>unErrorCode_GetInputData</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>...</td><td>VAR_GLOBAL</td><td>D2000</td></tr><tr><td>6</td><td>undStatusId_GetInputData</td><td>Double Word [Unsigned]/Bit String [32-bit](0.1)</td><td>...</td><td>VAR_GLOBAL</td><td>D2001</td></tr><tr><td>7</td><td>undStatusId_GetOutputData</td><td>Double Word [Unsigned]/Bit String [32-bit](0.1)</td><td>...</td><td>VAR_GLOBAL</td><td>D2005</td></tr><tr><td>8</td><td>unGetInputData_ConnectionNo1</td><td>Word [Unsigned]/Bit String [16-bit](0.63)</td><td>...</td><td>VAR_GLOBAL</td><td>D0</td></tr><tr><td>9</td><td>unGetInputData_ConnectionNo2</td><td>Word [Unsigned]/Bit String [16-bit](0.127)</td><td>...</td><td>VAR_GLOBAL</td><td>D200</td></tr><tr><td>10</td><td>bStopCommunication</td><td>Bit</td><td>...</td><td>VAR_GLOBAL</td><td>M200</td></tr></tbody></table> <p>Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOVAL_RETAIN. For the latch setting, refer to the following.</p> <p> MELSEC iQ-F FX5 User's Manual (Application)</p>				Label Name	Data Type		Class	Assign (Device/Label)	1	bnRequest_GetInputData	Bit(0.1)	...	VAR_GLOBAL	M0	2	bnRun_GetInputData	Bit	...	VAR_GLOBAL	M10	3	bnOK_GetInputData	Bit	...	VAR_GLOBAL	M20	4	bnNG_GetInputData	Bit	...	VAR_GLOBAL	M30	5	unErrorCode_GetInputData	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2000	6	undStatusId_GetInputData	Double Word [Unsigned]/Bit String [32-bit](0.1)	...	VAR_GLOBAL	D2001	7	undStatusId_GetOutputData	Double Word [Unsigned]/Bit String [32-bit](0.1)	...	VAR_GLOBAL	D2005	8	unGetInputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0.63)	...	VAR_GLOBAL	D0	9	unGetInputData_ConnectionNo2	Word [Unsigned]/Bit String [16-bit](0.127)	...	VAR_GLOBAL	D200	10	bStopCommunication	Bit	...	VAR_GLOBAL	M200
	Label Name	Data Type		Class	Assign (Device/Label)																																																																
1	bnRequest_GetInputData	Bit(0.1)	...	VAR_GLOBAL	M0																																																																
2	bnRun_GetInputData	Bit	...	VAR_GLOBAL	M10																																																																
3	bnOK_GetInputData	Bit	...	VAR_GLOBAL	M20																																																																
4	bnNG_GetInputData	Bit	...	VAR_GLOBAL	M30																																																																
5	unErrorCode_GetInputData	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2000																																																																
6	undStatusId_GetInputData	Double Word [Unsigned]/Bit String [32-bit](0.1)	...	VAR_GLOBAL	D2001																																																																
7	undStatusId_GetOutputData	Double Word [Unsigned]/Bit String [32-bit](0.1)	...	VAR_GLOBAL	D2005																																																																
8	unGetInputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0.63)	...	VAR_GLOBAL	D0																																																																
9	unGetInputData_ConnectionNo2	Word [Unsigned]/Bit String [16-bit](0.127)	...	VAR_GLOBAL	D200																																																																
10	bStopCommunication	Bit	...	VAR_GLOBAL	M200																																																																
FB to be used	• M+FX5-EIP_Class1GetInputData																																																																				

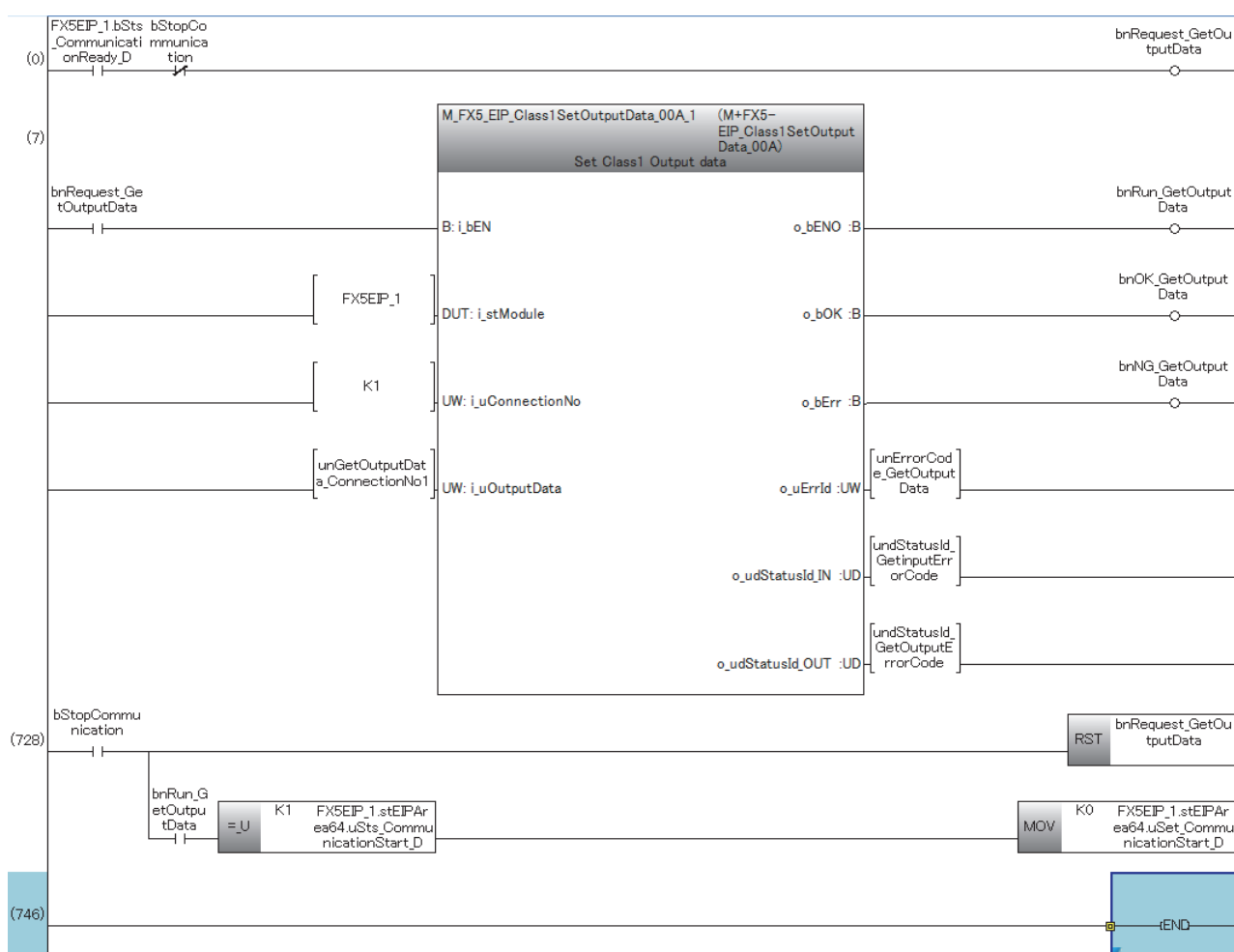




- (0) Start the acquisition of input data from connection number 1 and connection number 2, and start EtherNet/IP communication.
- (27) When M0 is on, "M+FX5-EIP_Class1GetInputData" is executed to acquire the connection number 1 input data.
When M20 is on, input data received from target 1 is stored consecutively starting from D0 according to the data size specified in connection 1.
- (759) When M1 is on, while 'Cyclic communication data link status' (U1\G1328.1) of connection number 2 is normal, the input data received from target 2 is refreshed from D200 by the data size set in connection number 2, and then the data is copied to W100 onwards.
- (804) By turning on M200, input data acquisition and EtherNet/IP communication are stopped.

Target 1-side program

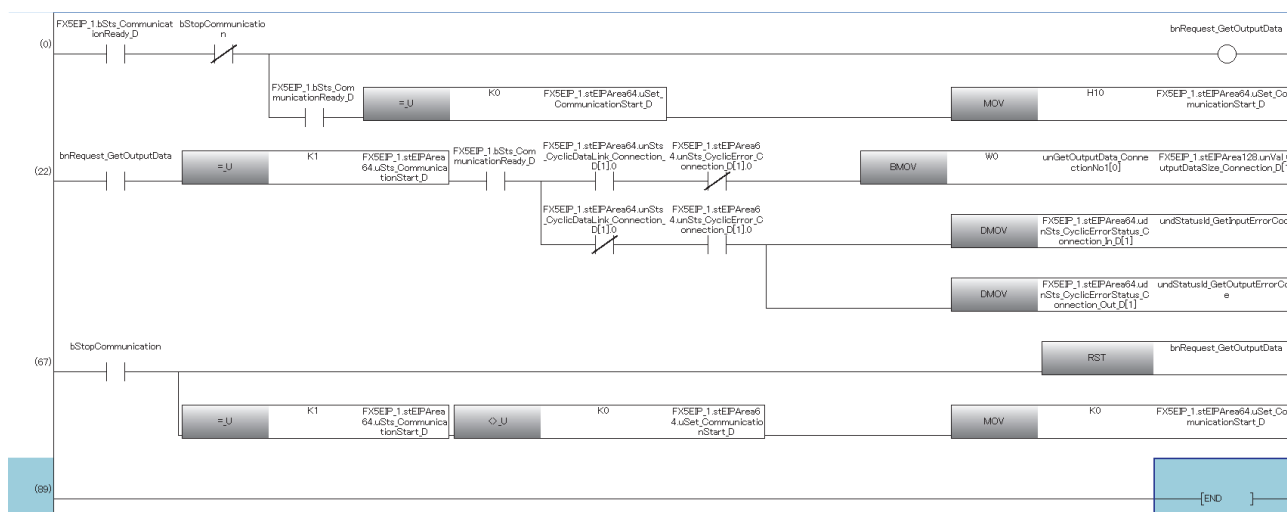
Classification	Label name	Description	Device																																																		
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																																																		
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																																																		
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																																																		
Label to be defined	<div>Define global labels as shown below.</div> <table><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>bStopCommunication</td><td>Bit</td><td>VAR_GLOBAL</td><td>M200</td></tr><tr><td>2</td><td>bnRequest_GetOutputData</td><td>Bit</td><td>VAR_GLOBAL</td><td>M0</td></tr><tr><td>3</td><td>bnRun_GetOutputData</td><td>Bit</td><td>VAR_GLOBAL</td><td>M10</td></tr><tr><td>4</td><td>bnOK_GetOutputData</td><td>Bit</td><td>VAR_GLOBAL</td><td>M20</td></tr><tr><td>5</td><td>bnNG_GetOutputData</td><td>Bit</td><td>VAR_GLOBAL</td><td>M30</td></tr><tr><td>6</td><td>unGetOutputData_ConnectionNo1</td><td>Word [Unsigned]/Bit String [16-bit](0..63)</td><td>VAR_GLOBAL</td><td>D0</td></tr><tr><td>7</td><td>unErrorCode_GetOutputData</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D2000</td></tr><tr><td>8</td><td>undStatusId_GetInputErrorCode</td><td>Double Word [Unsigned]/Bit String [32-bit]</td><td>VAR_GLOBAL</td><td>D2001</td></tr><tr><td>9</td><td>undStatusId_GetOutputErrorCode</td><td>Double Word [Unsigned]/Bit String [32-bit]</td><td>VAR_GLOBAL</td><td>D2003</td></tr></tbody></table> <div>Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOVAL_RETAIN. For the latch setting, refer to the following.</div> <div> MELSEC IQ-F FX5 User's Manual (Application)</div>				Label Name	Data Type	Class	Assign (Device/Label)	1	bStopCommunication	Bit	VAR_GLOBAL	M200	2	bnRequest_GetOutputData	Bit	VAR_GLOBAL	M0	3	bnRun_GetOutputData	Bit	VAR_GLOBAL	M10	4	bnOK_GetOutputData	Bit	VAR_GLOBAL	M20	5	bnNG_GetOutputData	Bit	VAR_GLOBAL	M30	6	unGetOutputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0..63)	VAR_GLOBAL	D0	7	unErrorCode_GetOutputData	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D2000	8	undStatusId_GetInputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	D2001	9	undStatusId_GetOutputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	D2003
	Label Name	Data Type	Class	Assign (Device/Label)																																																	
1	bStopCommunication	Bit	VAR_GLOBAL	M200																																																	
2	bnRequest_GetOutputData	Bit	VAR_GLOBAL	M0																																																	
3	bnRun_GetOutputData	Bit	VAR_GLOBAL	M10																																																	
4	bnOK_GetOutputData	Bit	VAR_GLOBAL	M20																																																	
5	bnNG_GetOutputData	Bit	VAR_GLOBAL	M30																																																	
6	unGetOutputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0..63)	VAR_GLOBAL	D0																																																	
7	unErrorCode_GetOutputData	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D2000																																																	
8	undStatusId_GetInputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	D2001																																																	
9	undStatusId_GetOutputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	D2003																																																	
FB to be used	• M+FX5-EIP_Class1SetOutputData																																																				



- (0) Set the output data processing for connection number 1 and start EtherNet/IP communications.
- (7) When M0 is on, "M+FX5-EIP_Class1SetOutputData" is executed to set the connection number 2 output data.
When M20 is on, the output data set in D0 onwards are transmitted to the originator for the number of words specified in connection number 1.
- (644) By turning on M200, output data setting and EtherNet/IP communication are stopped.

Target 2-side program

Classification	Label name	Description	Device																													
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																													
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																													
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																													
	FX5EIP_1.stEIPArea128.unVal_OutputDataSize_Connection_D[1]	Output/message communication (server) data size	U1\G432																													
	FX5EIP_1.stEIPArea64.bnSts_CyclicDataLink_Connection_D[1]	Cyclic communication data link status	U1\G1328.0																													
	FX5EIP_1.stEIPArea64.unSts_CyclicError_Connection_D[1].0	Cyclic communication error status	U1\G1336.0																													
	FX5EIP_1.stEIPArea64.udnSts_CyclicErrorStatus_Connection_In_D[1]	Cyclic communication input error status	U1\G1392																													
	FX5EIP_1.stEIPArea64.udnSts_CyclicErrorStatus_Connection_Out_D[1]	Cyclic communication output error status	U1\G1648																													
Label to be defined	Define global labels as shown below.																															
	<table><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>bStopCommunication</td><td>Bit</td><td>VAR GLOBAL</td><td>M200</td></tr><tr><td>2</td><td>bnRequest_GetOutputData</td><td>Bit</td><td>VAR GLOBAL</td><td>M0</td></tr><tr><td>3</td><td>unGetOutputData_ConnectionNo1</td><td>Word [Unsigned]/Bit String [16-bit](0..63)</td><td>VAR GLOBAL</td><td>D0</td></tr><tr><td>4</td><td>undStatusId_GetInputErrorCode</td><td>Double Word [Unsigned]/Bit String [32-bit]</td><td>VAR GLOBAL</td><td>D2001</td></tr><tr><td>5</td><td>undStatusId_GetOutputErrorCode</td><td>Double Word [Unsigned]/Bit String [32-bit]</td><td>VAR GLOBAL</td><td>D2003</td></tr></tbody></table> <p>Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOVAL_RETAIN. For the latch setting, refer to the following.</p> <p> MELSEC iQ-F FX5 User's Manual (Application)</p>				Label Name	Data Type	Class	Assign (Device/Label)	1	bStopCommunication	Bit	VAR GLOBAL	M200	2	bnRequest_GetOutputData	Bit	VAR GLOBAL	M0	3	unGetOutputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0..63)	VAR GLOBAL	D0	4	undStatusId_GetInputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR GLOBAL	D2001	5	undStatusId_GetOutputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR GLOBAL
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1	bStopCommunication	Bit	VAR GLOBAL	M200																												
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3	unGetOutputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0..63)	VAR GLOBAL	D0																												
4	undStatusId_GetInputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR GLOBAL	D2001																												
5	undStatusId_GetOutputErrorCode	Double Word [Unsigned]/Bit String [32-bit]	VAR GLOBAL	D2003																												



- (0) Set the output data processing for connection number 1 and start EtherNet/IP communications.
- (22) When M0 is on, while 'Cyclic communication data link status' (U1\G1328.0) of connection number 1 is normal, the data stored in W0 onwards are copied to D0 onwards as output data.
- The data stored in D0 and onwards are refreshed for the number of refresh points as transmission data, and then sent to the originator.
- (67) By turning on M200, output data setting and EtherNet/IP communication are stopped.

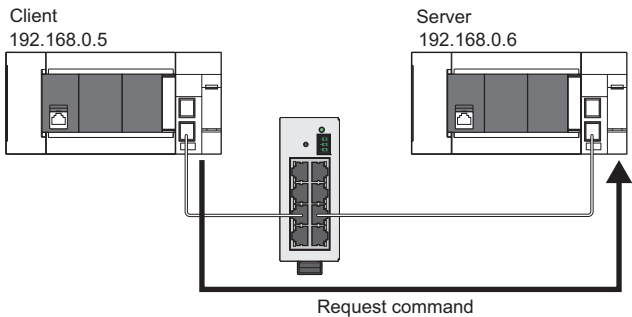
8.3 Example of UCMM Instance Communications

This section describes example of executing UCMM instance communications between FX5-EIP modules.

System configuration

The following system configuration is used for examples of UCMM instance communications.

"Maximum Number of Connections Setting" of each FX5-EIP is assumed to be set to 64.



- Request command
 - Service: 01H (Get_Attributes_All)
 - Class: 01H (Identity object)
 - Attribute: 00H
 - Instance: 01H

Parameter settings

Use the engineering tool to set the parameters.

Point

In the program examples, default values are used for settings other than parameters shown in the setting procedure. For the parameters, refer to the following.

➞ Page 89 PARAMETER SETTINGS

FX5-EIP (client) settings

Connect the engineering tool to the client-side CPU module and set the parameters.

1. Set the IP address.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 0 . 5
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.0.5
Subnet mask: 255.255.255.0

2. Click the [Apply] button.

3. Write the set parameters to the client-side CPU module. Then reset the CPU module or power off and on the system.

[Online] ⇒ [Write to PLC]

Point

For UCMM instance communications, parameter settings in "EtherNet/IP Configuration" are not required.

FX5-EIP (server) settings

Connect the engineering tool to the server-side CPU module and set the parameters.

1. Set the IP address.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 0 . 6
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	. . .
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.0.6
Subnet mask: 255.255.255.0

2. Set "EtherNet/IP Auto-start Setting" to "Start".

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
EtherNet/IP Setting	
Maximum Number of Connections Setting	
Maximum Number of Connections Setting	64 connections
Refresh Settings	
Refresh Settings	<Detailed Setting>
EtherNet/IP Auto-start Setting	
EtherNet/IP Auto-start Setting	Start

Point

When this item is not set, follow the same steps as the client-side program to set the EtherNet/IP communication start request to a value other than 0.

Page 148 Client-side program

3. Click the [Apply] button.

4. Write the set parameters to the server-side CPU module. Then reset the CPU module or power off and on the system.

[Online] ⇒ [Write to PLC]

Point

For UCMM instance communications, parameter settings in "EtherNet/IP Configuration" are not required.

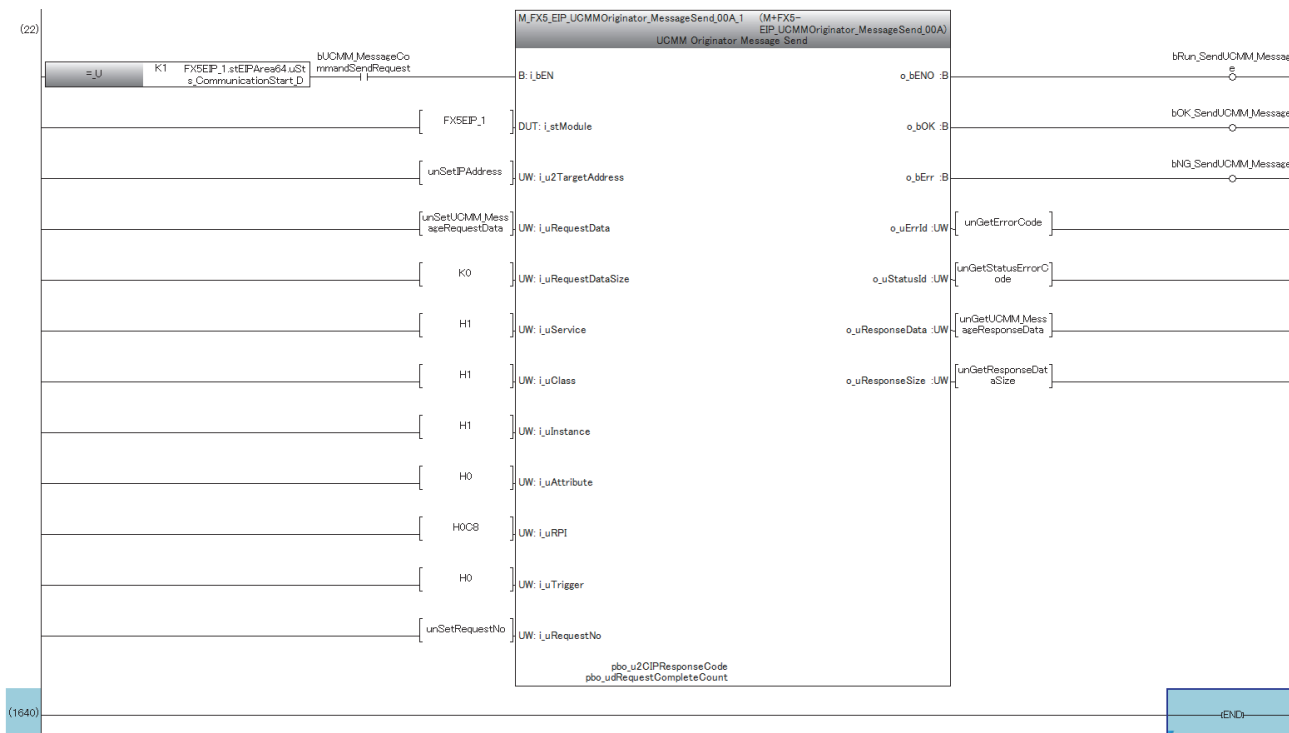
When the program is executed, the following request commands are transmitted to the server side.

Point 

A server-side program is not required.

Classification	Label name	Description	Device																																																												
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																																																												
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																																																												
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																																																												
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>bUCMM_MessageCommandSendRequest</td><td>Bit</td><td>VAR_GLOBAL</td><td>M100</td></tr> <tr> <td>2</td><td>bRun_SendUCMM_Message</td><td>Bit</td><td>VAR_GLOBAL</td><td>M110</td></tr> <tr> <td>3</td><td>bOK_SendUCMM_Message</td><td>Bit</td><td>VAR_GLOBAL</td><td>M120</td></tr> <tr> <td>4</td><td>bNG_SendUCMM_Message</td><td>Bit</td><td>VAR_GLOBAL</td><td>M130</td></tr> <tr> <td>5</td><td>unSetUCMM_MessageRequestData</td><td>Word [Unsigned]/Bit String [16-bit](0.706)</td><td>VAR_GLOBAL</td><td>D1000</td></tr> <tr> <td>6</td><td>unGetUCMM_MessageResponseData</td><td>Word [Unsigned]/Bit String [16-bit](0.706)</td><td>VAR_GLOBAL</td><td>D2000</td></tr> <tr> <td>7</td><td>unSetIPAddress</td><td>Word [Unsigned]/Bit String [16-bit](0.1)</td><td>VAR_GLOBAL</td><td>D3000</td></tr> <tr> <td>8</td><td>unSetRequestNo</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3002</td></tr> <tr> <td>9</td><td>unGetErrorCode</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3003</td></tr> <tr> <td>10</td><td>unGetStatusErrorCode</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3004</td></tr> <tr> <td>11</td><td>unGetResponseDataSize</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3005</td></tr> </tbody> </table> <p>Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOVAL_RETAIN. For the latch setting, refer to the following.</p> <p> MELSEC iQ-F FX5 User's Manual (Application)</p> <p>For the response data storage location, refer to the manuals of the EtherNet/IP devices as the server and secure the sufficient data size.</p>				Label Name	Data Type	Class	Assign (Device/Label)	1	bUCMM_MessageCommandSendRequest	Bit	VAR_GLOBAL	M100	2	bRun_SendUCMM_Message	Bit	VAR_GLOBAL	M110	3	bOK_SendUCMM_Message	Bit	VAR_GLOBAL	M120	4	bNG_SendUCMM_Message	Bit	VAR_GLOBAL	M130	5	unSetUCMM_MessageRequestData	Word [Unsigned]/Bit String [16-bit](0.706)	VAR_GLOBAL	D1000	6	unGetUCMM_MessageResponseData	Word [Unsigned]/Bit String [16-bit](0.706)	VAR_GLOBAL	D2000	7	unSetIPAddress	Word [Unsigned]/Bit String [16-bit](0.1)	VAR_GLOBAL	D3000	8	unSetRequestNo	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3002	9	unGetErrorCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3003	10	unGetStatusErrorCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3004	11	unGetResponseDataSize	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3005
	Label Name	Data Type	Class	Assign (Device/Label)																																																											
1	bUCMM_MessageCommandSendRequest	Bit	VAR_GLOBAL	M100																																																											
2	bRun_SendUCMM_Message	Bit	VAR_GLOBAL	M110																																																											
3	bOK_SendUCMM_Message	Bit	VAR_GLOBAL	M120																																																											
4	bNG_SendUCMM_Message	Bit	VAR_GLOBAL	M130																																																											
5	unSetUCMM_MessageRequestData	Word [Unsigned]/Bit String [16-bit](0.706)	VAR_GLOBAL	D1000																																																											
6	unGetUCMM_MessageResponseData	Word [Unsigned]/Bit String [16-bit](0.706)	VAR_GLOBAL	D2000																																																											
7	unSetIPAddress	Word [Unsigned]/Bit String [16-bit](0.1)	VAR_GLOBAL	D3000																																																											
8	unSetRequestNo	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3002																																																											
9	unGetErrorCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3003																																																											
10	unGetStatusErrorCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3004																																																											
11	unGetResponseDataSize	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3005																																																											
FB to be used	• M+FX5-EIP_UCMMOriginator_MessageSend																																																														





- (0) Set the request number and destination IP address for UCMM message communications, and start EtherNet/IP communications.
- (22) By turning on M100, "M+FX5-EIP_UCMMOriginator_MessageSend" is executed and the request data is transmitted to the server side. When the response is received successfully, M120 turns on and the response result from the server side is stored from D2000 onwards. (Half of the response data size stored in D3005 (bytes) is stored (rounded up).)
- If the response data size is an odd number, only the lower one byte of the end device is stored.



Ensure that the request number to be set is not the same as the connection number used for Class3 communications or the request number used for other UCMM communications, Class1 communications, and Class3 communications.

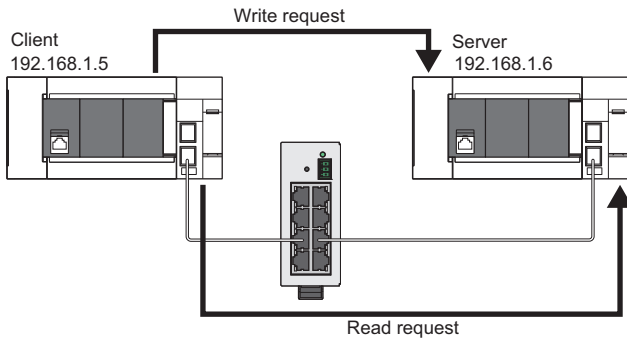
8.4 Example of UCMM Tag Communications

This section describes examples of executing UCMM tag communications between FX5-EIP modules.

System configuration

The following system configuration is used for examples of UCMM tag communications.

"Maximum Number of Connections Setting" of each FX5-EIP is assumed to be set to 64.



■Write request

- Tag name: Tag001
- Tag type: INT
- Size: 10 + Request data (10 words)

■Read request

- Tag name: Tag002
- Tag type: DINT
- Size: 10

Communication description

When the communication example for UCMM tag communications is executed, the following operation is performed.

Client-side operation

■Write request to tags

By executing a UCMM tag communication write request, the device area data stored from D1000 onwards is written to the Tag001 tag on the server side according to the requested size. ^{*1}

^{*1} If the requested data type is INT, request data consisting of the request data size × 1 word (10 words in the program example) is transmitted.

If the requested data type is DINT, request data consisting of the request data size × 2 words is transmitted.

■Tag read request

By executing a UCMM tag communication read request, the data set to the Tag002 tag on the server side is read according to the requested size. From the read data, the number of read data size (stored in D3204) is stored from D2000 onwards (Regardless of the tag data type of the external device, the received read data size is stored in units of words.)

In addition, the size of the data read from the tag of the external device depends on the read request data size set in the output argument (i_uDataSize) of the module function block, as well as the external device tag data type (value stored in D3203). ^{*1*2}

^{*1} If the external device tag data type is INT, the read request data size × 1 word is read.

If the external device tag data type is DINT, the read request data size × 2 words is read.

^{*2} The read request tag data type set in the module function block input argument (i_uDataType) is used to perform a parameter check when transmitting a request.

If the data type of the external device tag that was read is different, check whether the requested tag name and data size are correct.

Server-side operation

The current values of the tag data set in Tag001 and Tag002 are read and the current values are updated.

During server-side operation, both read and write requests from the client side for the tag can be accepted.

However, if the data is updated due to a write request while the current value is being read, or if the data currently being updated is read due to a read request, it may result in a data inconsistency.

Parameter settings

Use the engineering tool to set the parameters.

Point

In the program examples, default values are used for settings other than parameters shown in the setting procedure. For the parameters, refer to the following.

☞ Page 89 PARAMETER SETTINGS

FX5-EIP (client) settings

Connect the engineering tool to the client-side CPU module and set the parameters.

1. Set the IP address.

☞ Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 0 . 5
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	. . .
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.1.5

Subnet mask: 255.255.255.0

2. Click the [Apply] button.

3. Write the set parameters to the client-side CPU module. Then reset the CPU module or power off and on the system.

☞ [Online] ⇒ [Write to PLC]

Point

For UCMM tag communications, parameter settings in "EtherNet/IP Configuration" are not required.

FX5-EIP (server) settings

Connect the engineering tool to the server-side CPU module and set the parameters.

1. Set the IP address.

☞ Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 1 . 6
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	. . .
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.1.6

Subnet mask: 255.255.255.0

2. Click the [Apply] button.

3. Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

☞ Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

4. Double-click <Detailed Setting> in the "Connection Setting" column and set the tags for connection number 1 and connection number 2.

- Tag setting (Connection number 1)

Connection Setting

Connection Information Number of Connections: 2/64 PPS: 0

Connection List

Module Order Connection Detail List PPS List

Own Node

Target

Tag

(001)

(002)

Originator

Add Connection Delete Connection

Connection Detailed Setting

Item	Setting Value	Unit
Connection Name	Connection (Class3/UCMM Tag)	-
Connection No.	001	-
Comment		-
Data Type	INT	-
Tag Name	Tag001	-
Tag Name Size	6	Characters
Size	10	-

Explanation

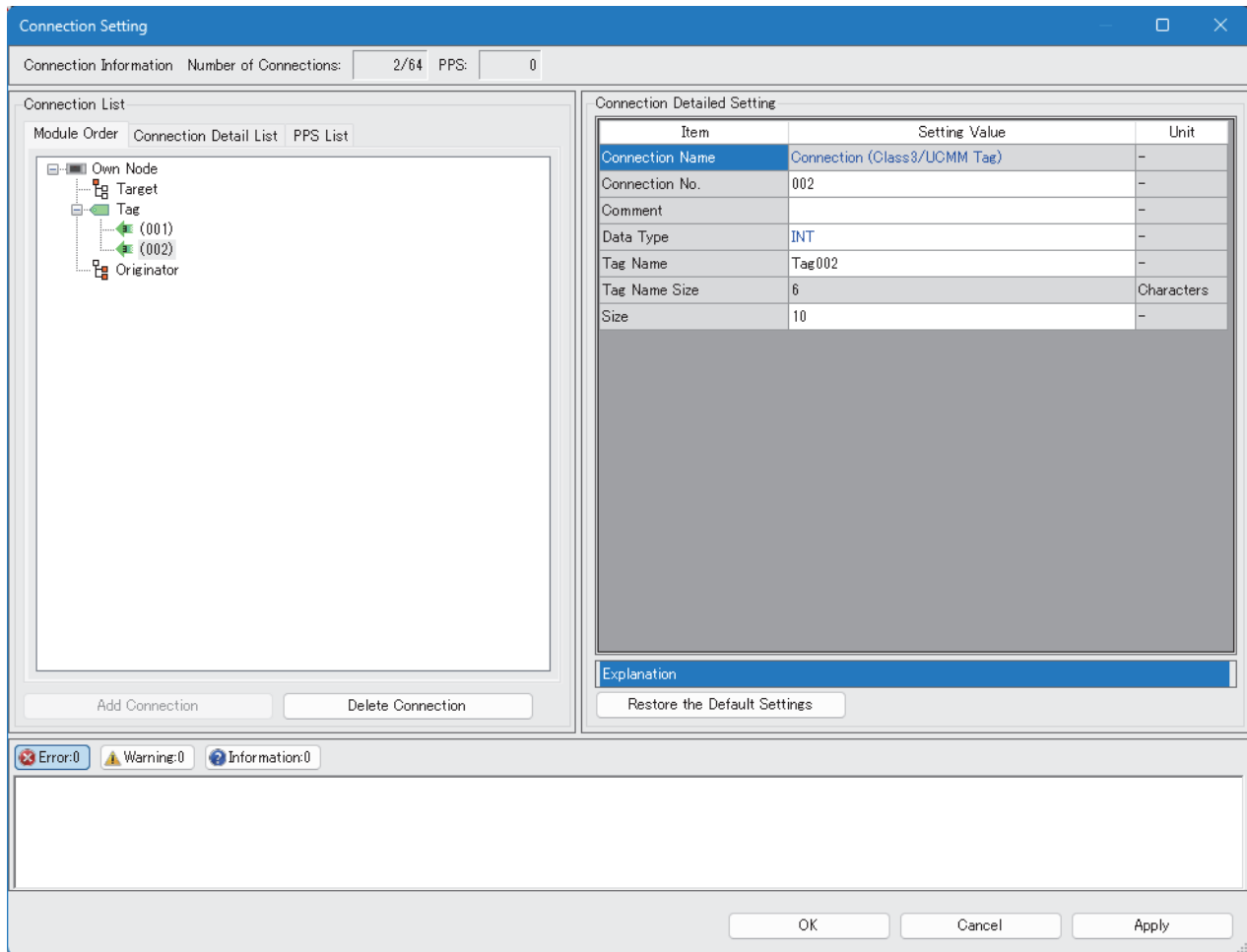
Restore the Default Settings

Error:0 Warning:0 Information:0

OK Cancel Apply

- When adding a connection, select "Tag" and [Connection (Class3/UCMM Tag)].
- Tag name: Tag001
- Data type: INT (1 word)
- Size: 10

- Tag setting (Connection number 2)



- When adding a connection, select "Tag" and [Connection (Class3/UCMM Tag)].
- Tag name: Tag002
- Data type: DINT (2 word)
- Size: 10

5. Click the [Apply] button.

6. Click the [OK] button to close the connection settings.

7. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

8. Write the set parameters to the server-side CPU module. Then reset the CPU module or power off and on the system.

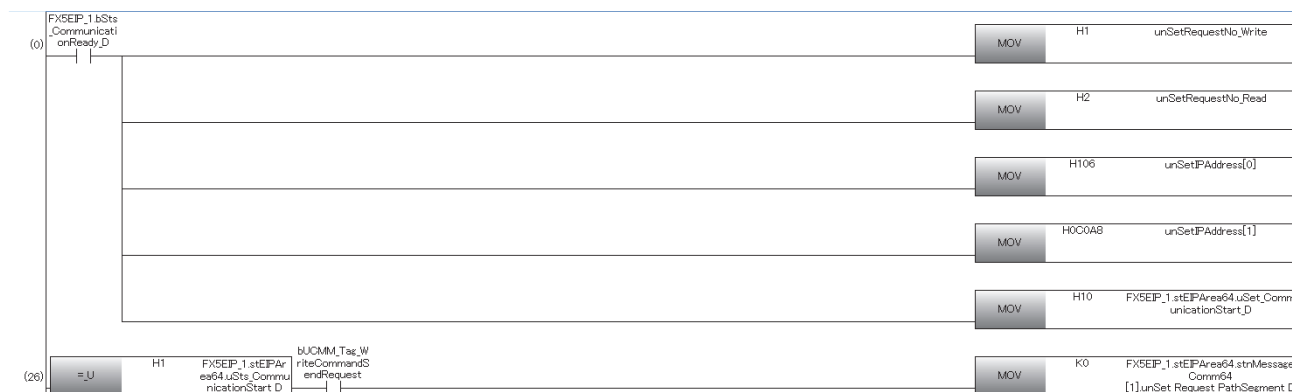
[Online] ⇒ [Write to PLC]

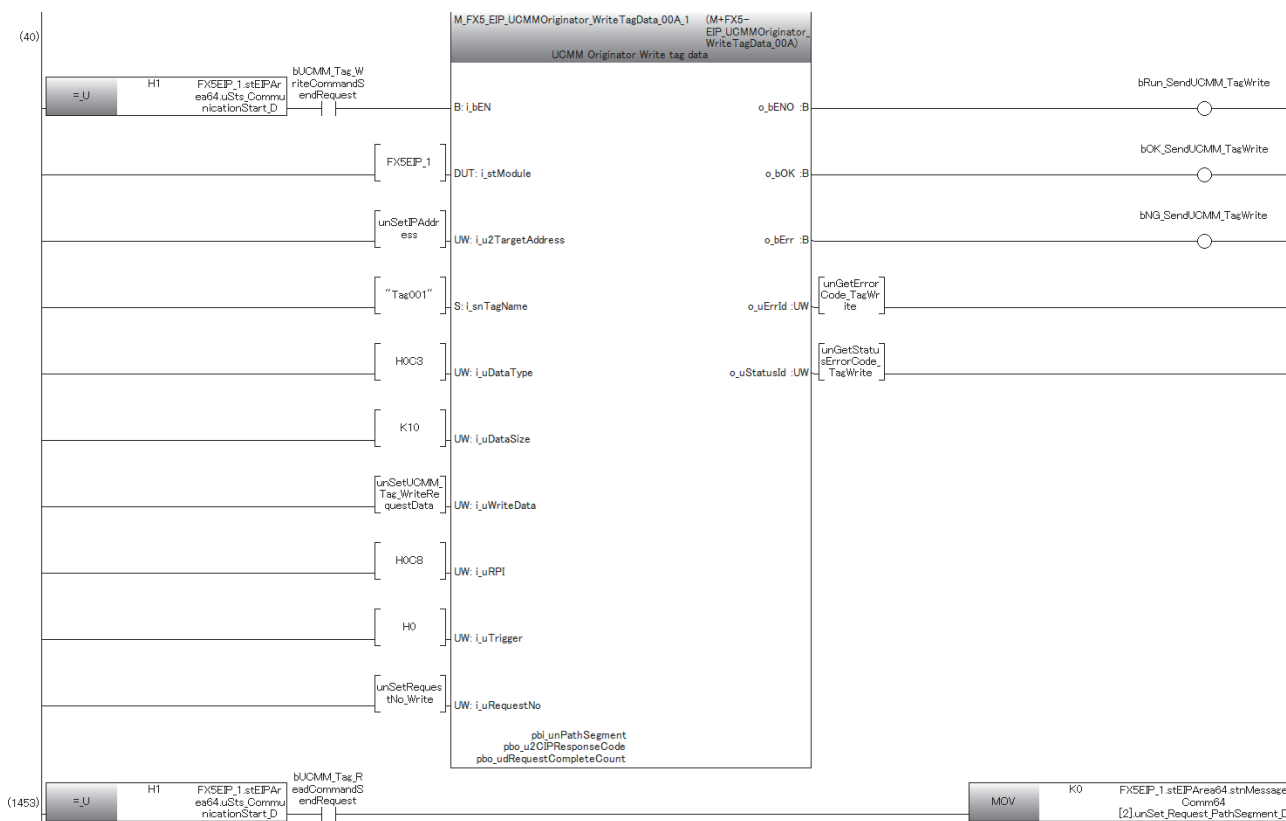
Program example

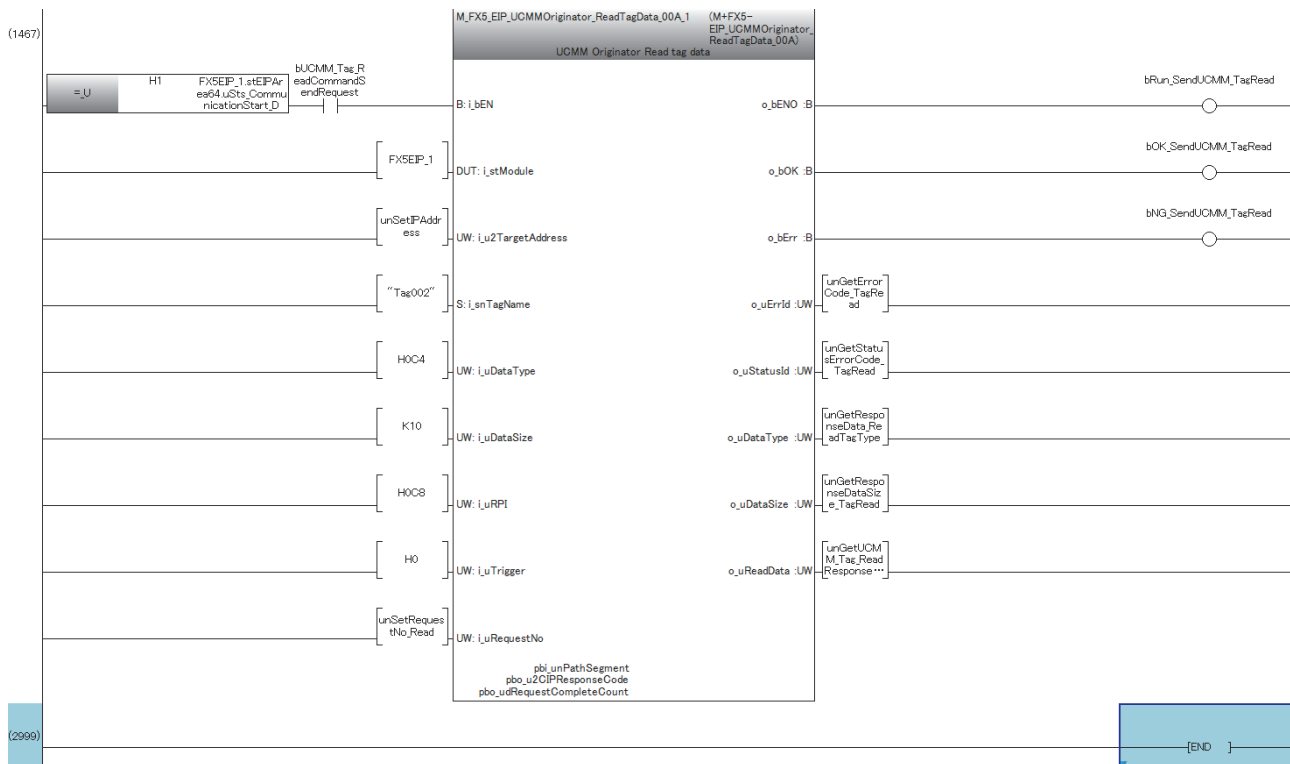
The UCMM tag communication program is executed by changing the CPU module from STOP to RUN.

Client-side program

Classification	Label name	Description	Device																																																																																																				
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																																																																																																				
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																																																																																																				
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																																																																																																				
	FX5EIP_1.stEIPArea64.stnMessageComm64[1].unSet_Request_PathSegment_D	Message communication request area Path Segment	U1\G4665																																																																																																				
	FX5EIP_1.stEIPArea64.stnMessageComm64[2].unSet_Request_PathSegment_D	Message communication request area Path Segment	U1\G4857																																																																																																				
Label to be defined	Define global labels as shown below.																																																																																																						
	<table><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>bUCMM_Tag_WriteCommandSendR</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 00</td></tr><tr><td>2</td><td>bUCMM_Tag_ReadCommandSendR</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 01</td></tr><tr><td>3</td><td>bRun_SendUCMM_TagWrite</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 10</td></tr><tr><td>4</td><td>bOK_SendUCMM_TagWrite</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 20</td></tr><tr><td>5</td><td>bNG_SendUCMM_TagWrite</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 30</td></tr><tr><td>6</td><td>bRun_SendUCMM_TagRead</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 11</td></tr><tr><td>7</td><td>bOK_SendUCMM_TagRead</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 21</td></tr><tr><td>8</td><td>bNG_SendUCMM_TagRead</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 31</td></tr><tr><td>9</td><td>unSetUCMM_Tag_WriteRequestData</td><td>Word (Unsigned)/Bit String [16-bit](0.706)</td><td>VAR_GLOBAL</td><td>D1 000</td></tr><tr><td>10</td><td>unGetUCMM_Tag_ReadResponseData</td><td>Word (Unsigned)/Bit String [16-bit](0.706)</td><td>VAR_GLOBAL</td><td>D2 000</td></tr><tr><td>11</td><td>unSetIPAddress</td><td>Word (Unsigned)/Bit String [16-bit](0.1)</td><td>VAR_GLOBAL</td><td>D3 000</td></tr><tr><td>12</td><td>unSetRequestNo_Write</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D31 00</td></tr><tr><td>13</td><td>unGetErrorCode_TagWrite</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D31 01</td></tr><tr><td>14</td><td>unGetStatusErrorCode_TagWrite</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D31 02</td></tr><tr><td>15</td><td>unSetRequestNo_Read</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D32 00</td></tr><tr><td>16</td><td>unGetErrorCode_TagRead</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D32 01</td></tr><tr><td>17</td><td>unGetStatusErrorCode_TagRead</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D32 02</td></tr><tr><td>18</td><td>unGetResponseData_ReadTagType</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D32 03</td></tr><tr><td>19</td><td>unGetResponseDataSize_TagRead</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D32 04</td></tr></tbody></table>		Label Name	Data Type	Class	Assign (Device/Label)	1	bUCMM_Tag_WriteCommandSendR	Bit	VAR_GLOBAL	M1 00	2	bUCMM_Tag_ReadCommandSendR	Bit	VAR_GLOBAL	M1 01	3	bRun_SendUCMM_TagWrite	Bit	VAR_GLOBAL	M1 10	4	bOK_SendUCMM_TagWrite	Bit	VAR_GLOBAL	M1 20	5	bNG_SendUCMM_TagWrite	Bit	VAR_GLOBAL	M1 30	6	bRun_SendUCMM_TagRead	Bit	VAR_GLOBAL	M1 11	7	bOK_SendUCMM_TagRead	Bit	VAR_GLOBAL	M1 21	8	bNG_SendUCMM_TagRead	Bit	VAR_GLOBAL	M1 31	9	unSetUCMM_Tag_WriteRequestData	Word (Unsigned)/Bit String [16-bit](0.706)	VAR_GLOBAL	D1 000	10	unGetUCMM_Tag_ReadResponseData	Word (Unsigned)/Bit String [16-bit](0.706)	VAR_GLOBAL	D2 000	11	unSetIPAddress	Word (Unsigned)/Bit String [16-bit](0.1)	VAR_GLOBAL	D3 000	12	unSetRequestNo_Write	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D31 00	13	unGetErrorCode_TagWrite	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D31 01	14	unGetStatusErrorCode_TagWrite	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D31 02	15	unSetRequestNo_Read	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 00	16	unGetErrorCode_TagRead	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 01	17	unGetStatusErrorCode_TagRead	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 02	18	unGetResponseData_ReadTagType	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 03	19	unGetResponseDataSize_TagRead	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 04		
	Label Name	Data Type	Class	Assign (Device/Label)																																																																																																			
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2	bUCMM_Tag_ReadCommandSendR	Bit	VAR_GLOBAL	M1 01																																																																																																			
3	bRun_SendUCMM_TagWrite	Bit	VAR_GLOBAL	M1 10																																																																																																			
4	bOK_SendUCMM_TagWrite	Bit	VAR_GLOBAL	M1 20																																																																																																			
5	bNG_SendUCMM_TagWrite	Bit	VAR_GLOBAL	M1 30																																																																																																			
6	bRun_SendUCMM_TagRead	Bit	VAR_GLOBAL	M1 11																																																																																																			
7	bOK_SendUCMM_TagRead	Bit	VAR_GLOBAL	M1 21																																																																																																			
8	bNG_SendUCMM_TagRead	Bit	VAR_GLOBAL	M1 31																																																																																																			
9	unSetUCMM_Tag_WriteRequestData	Word (Unsigned)/Bit String [16-bit](0.706)	VAR_GLOBAL	D1 000																																																																																																			
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11	unSetIPAddress	Word (Unsigned)/Bit String [16-bit](0.1)	VAR_GLOBAL	D3 000																																																																																																			
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13	unGetErrorCode_TagWrite	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D31 01																																																																																																			
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15	unSetRequestNo_Read	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 00																																																																																																			
16	unGetErrorCode_TagRead	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 01																																																																																																			
17	unGetStatusErrorCode_TagRead	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 02																																																																																																			
18	unGetResponseData_ReadTagType	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 03																																																																																																			
19	unGetResponseDataSize_TagRead	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D32 04																																																																																																			
	Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOBAL_RETAIN. For the latch setting, refer to the following.																																																																																																						
	MELSEC iQ-F FX5 User's Manual (Application)																																																																																																						
FBs to be used	• M+FX5-EIP_UCMMOriginator_WriteTagData • M+FX5-EIP_UCMMOriginator_ReadTagData																																																																																																						







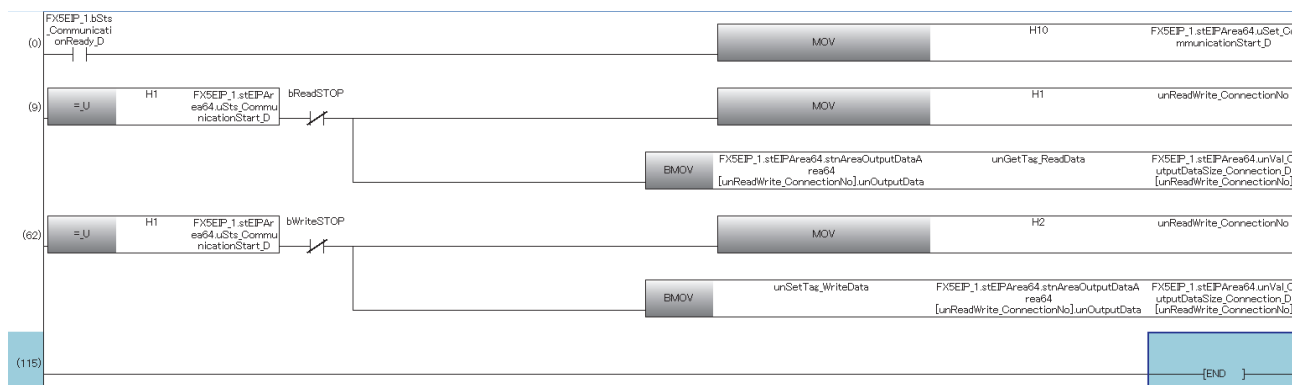
- (0) Set the request number and destination IP address for UCMM tag communications, and start EtherNet/IP communications.
- (26) Specify "0" (Disabled) for the Path Segment data used in the module function block.
- (40) By turning on M100, "M+FX5-EIP_UCMMOriginator_WriteTagData" is executed and a write request is transmitted to the server side.
When M120 is on, 10 words of data stored in D1000 onwards is written to Tag001 on the server side.
- (1453) Specify "0" (Disabled) for the Path Segment data used in the module function block.
- (1467) By turning on M101, "M+FX5-EIP_UCMMOriginator_ReadTagData" is executed and a Read request is transmitted to the server side.
When M121 is on, the server-side response result is stored from D2000 onwards according to the response data size stored in D3204.

Point

- Ensure that the request number to be set is not the same as the connection number used for Class3 communications or the request number used for other UCMM communications, Class1 communications, and Class3 communications.
- When transmitting a request to a device that does not require the Path Segment setting, such as the FX5-EIP, the settings must be configured as shown in the 1453rd step of the program example. (Page 248 Message communication request/response area)

Server-side program

Classification	Label name	Description	Device																																				
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																																				
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																																				
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																																				
	FX5EIP_1.stEIPArea64.stnAreaInputDataArea64[unReadWrite_ConnectionNo].unInputData	Input data area	U1\G16944 to U1\G63151																																				
	FX5EIP_1.stEIPArea64.stnAreaOutputDataArea64[unReadWrite_ConnectionNo].unOutputData	Output/message communication (server) data area	U1\G63152 to U1\G109359																																				
	FX5EIP_1.stEIPArea64.unVal_InputDataSize_Connection_D[unReadWrite_ConnectionNo]	Input data size	U1\G304 to U1\G367																																				
	FX5EIP_1.stEIPArea64.unVal_OutputDataSize_Connection_D[unReadWrite_ConnectionNo]	Output/message communication (server) data size	U1\G432 to U1\G495																																				
Label to be defined	Define global labels as shown below. <table><tr><th></th><th>Label Name</th><th>Data Type</th><th></th><th>Class</th><th>Assign (Device/Label)</th></tr><tr><td>1</td><td>bReadSTOP</td><td>Bit</td><td>...</td><td>VAR_GLOBAL</td><td>IM11</td></tr><tr><td>2</td><td>bWriteSTOP</td><td>Bit</td><td>...</td><td>VAR_GLOBAL</td><td>IM12</td></tr><tr><td>3</td><td>unReadWrite_ConnectionNo</td><td>Word [Signed]</td><td>...</td><td>VAR_GLOBAL</td><td>D300</td></tr><tr><td>4</td><td>unSetTag_WriteData</td><td>Word [Unsigned]/Bit String [16-bit](0.721)</td><td>...</td><td>VAR_GLOBAL</td><td>D1000</td></tr><tr><td>5</td><td>unGetTag_ReadData</td><td>Word [Unsigned]/Bit String [16-bit](0.721)</td><td>...</td><td>VAR_GLOBAL</td><td>D2000</td></tr></table> <p>Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOVAL_RETAIN. For the latch setting, refer to the following.</p> <p> MELSEC iQ-F FX5 User's Manual (Application)</p>				Label Name	Data Type		Class	Assign (Device/Label)	1	bReadSTOP	Bit	...	VAR_GLOBAL	IM11	2	bWriteSTOP	Bit	...	VAR_GLOBAL	IM12	3	unReadWrite_ConnectionNo	Word [Signed]	...	VAR_GLOBAL	D300	4	unSetTag_WriteData	Word [Unsigned]/Bit String [16-bit](0.721)	...	VAR_GLOBAL	D1000	5	unGetTag_ReadData	Word [Unsigned]/Bit String [16-bit](0.721)	...	VAR_GLOBAL	D2000
	Label Name	Data Type		Class	Assign (Device/Label)																																		
1	bReadSTOP	Bit	...	VAR_GLOBAL	IM11																																		
2	bWriteSTOP	Bit	...	VAR_GLOBAL	IM12																																		
3	unReadWrite_ConnectionNo	Word [Signed]	...	VAR_GLOBAL	D300																																		
4	unSetTag_WriteData	Word [Unsigned]/Bit String [16-bit](0.721)	...	VAR_GLOBAL	D1000																																		
5	unGetTag_ReadData	Word [Unsigned]/Bit String [16-bit](0.721)	...	VAR_GLOBAL	D2000																																		



- (0) Start EtherNet/IP communications.
- (9) Specify the connection number set for the tag with which to read the current value, and copy the data set for the specified tag to D2000.
- (62) Specify the connection number set for the tag with which to update the current value, and update the data set for the specified tag to the data set in D1000.

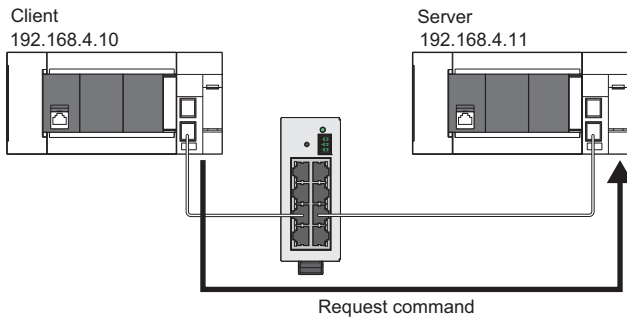
8.5 Example of Class3 Instance Communications

This section describes examples of executing Class3 instance communications between FX5-EIP modules.

System configuration

The following system configuration is used for examples of Class3 instance communications.

"Maximum Number of Connections Setting" of each FX5-EIP is assumed to be set to 64.



- Request command
 - Service: 01H (Get_Attributes_All)
 - Class: 01H (Identity object)
 - Attribute: 00H
 - Instance: 01H

Parameter settings

Use the engineering tool to set the parameters.



In the program examples, default values are used for settings other than parameters shown in the setting procedure. For the parameters, refer to the following.

➞ Page 89 PARAMETER SETTINGS

FX5-EIP (client) settings

Connect the engineering tool to the client-side CPU module and set the parameters.

1. Set the CPU module as follows.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 4 . 10
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.4.10

Subnet mask: 255.255.255.0

2. Click the [Apply] button.
3. Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

4. From "Module List", add "FX5-EIP" to the list of EtherNet/IP devices.

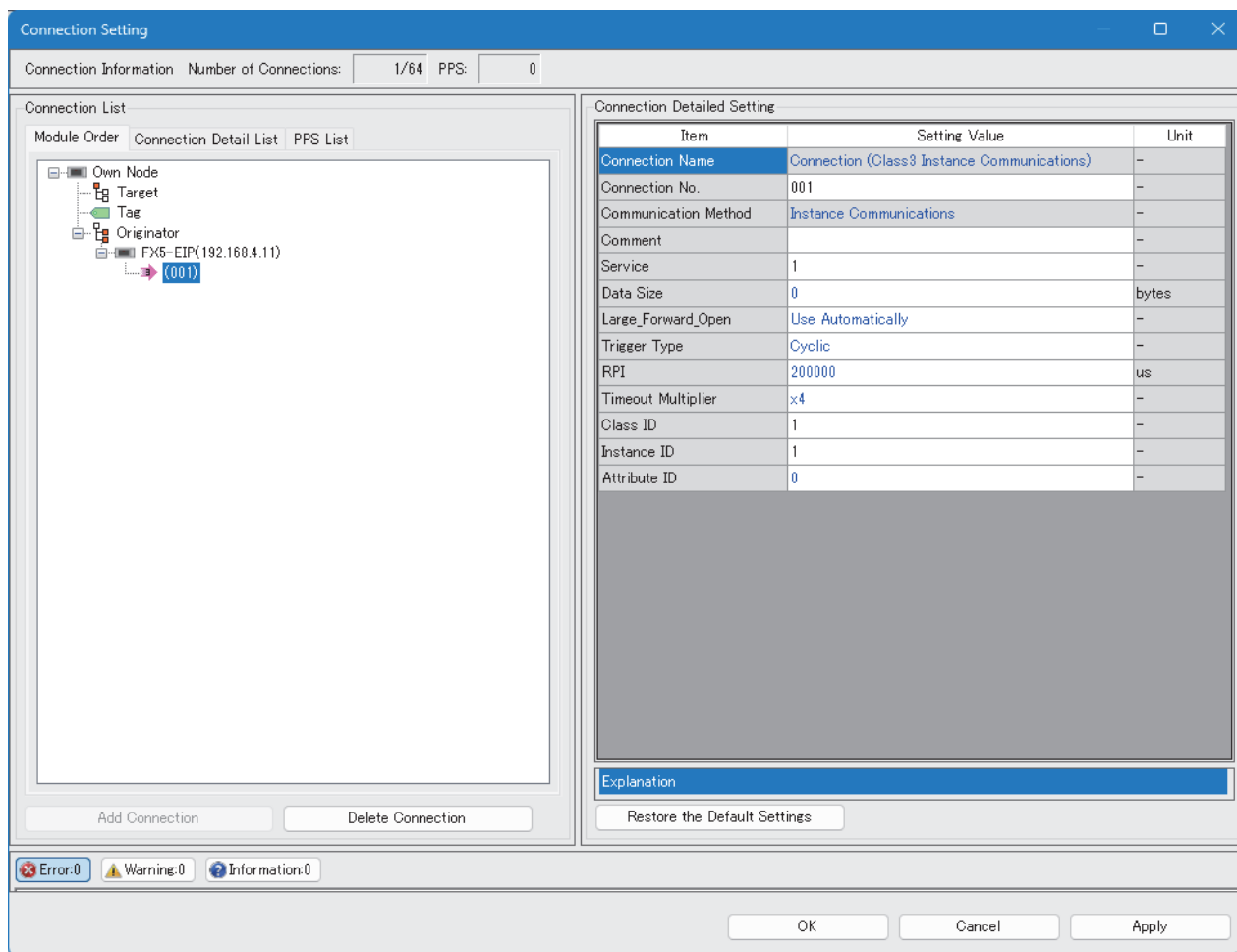
Point

If "FX5-EIP" is not shown in the "Module List", the EDS file needs to be added.

For adding the EDS file, refer to the following.

☞ Page 122 Adding/deleting the EDS file

5. Double-click <Detailed Setting> in the "Connection Setting" column and set the connection of the originator.



- When adding a connection, select [Connection (Class3 Instance Communications)].
- Service: 1
- Class ID: 1
- Instance ID: 1

6. Click the [Apply] button.
 7. Click the [OK] button to close the connection settings.
 8. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.
 9. Write the set parameters to the originator-side CPU module. Then reset the CPU module or power off and on the system.
-  [Online] ⇒ [Write to PLC]

FX5-EIP (server) settings

Connect the engineering tool to the server-side CPU module and set the parameters.

1. Set the IP address.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 4 . 11
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	. . .
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.4.11

Subnet mask: 255.255.255.0

2. Set "EtherNet/IP Auto-start Setting" to "Start".

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
EtherNet/IP Auto-start Setting	
<i>EtherNet/IP Auto-start Setting</i>	Start

Point

When this item is not set, follow the same steps as the client-side program to set the EtherNet/IP communication start request to H10.

Page 163 Client-side program

3. Click the [Apply] button.

4. Write the set parameters to the server-side CPU module. Then reset the CPU module or power off and on the system.

[Online] ⇒ [Write to PLC]

Point

For Class3 instance communications, parameter settings in "EtherNet/IP Configuration" are not required.

Program example

The Class3 instance communications program is executed by changing the CPU module from STOP to RUN.

The following example shows a program to execute Class3 instance communications by turning on the Class3 command transmission request in the program.

When the program is executed, the following request commands are transmitted to the server side.

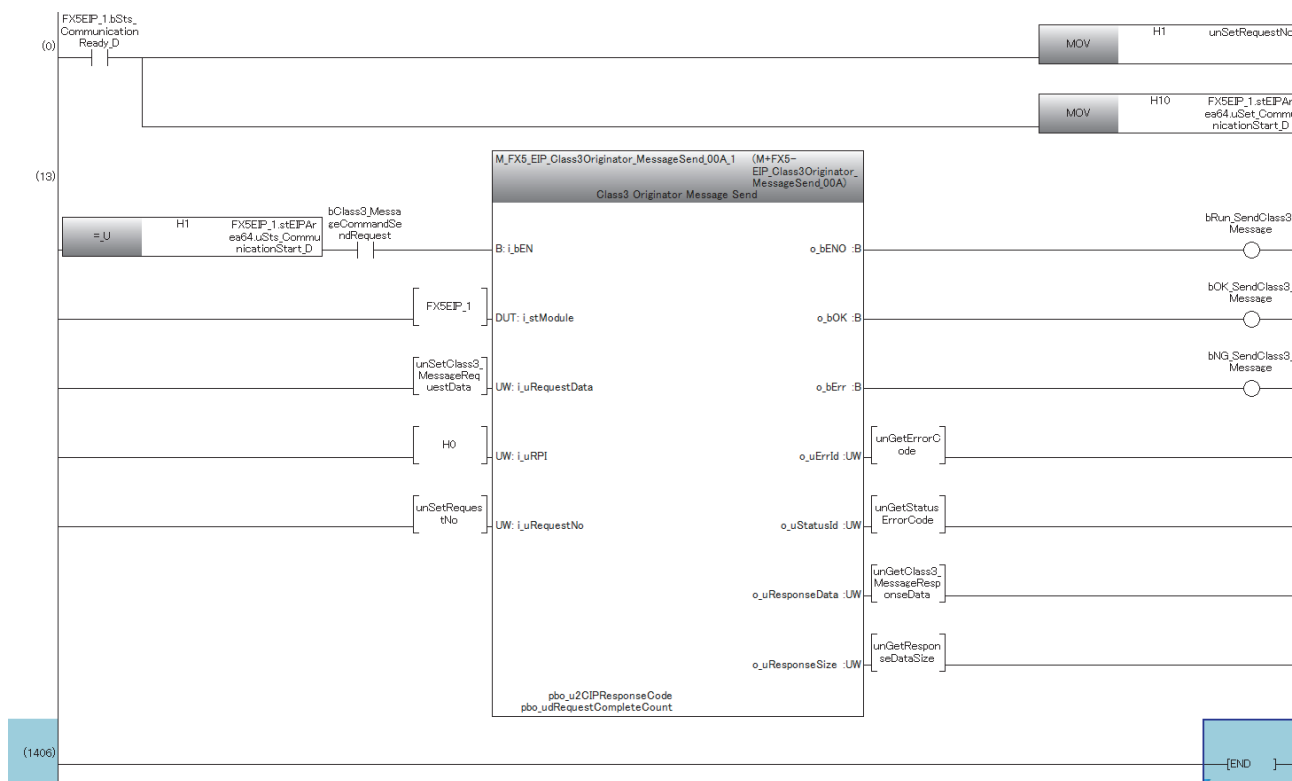
Item	Data to be specified	Description
Service code	01H	Get_Attributes_All (Acquires all attributes of the instances specified by Class ID and Instance ID.)
Class ID	01H	Specifies the Identity object.
Instance ID	01H	—
Attribute ID	00H	Due to the "Get_Attributes_All" command, no specific Attribute ID is specified.
Request data	None	Specifies the request data size as 0.



A server-side program is not required.

Client-side program

Classification	Label name	Description	Device																																																							
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																																																							
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																																																							
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																																																							
Label to be defined	<div>Define global labels as shown below.</div> <table><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>bClass3_MessageCommandSendReq</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 00</td></tr><tr><td>2</td><td>bRun_SendClass3_Message</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 10</td></tr><tr><td>3</td><td>bOK_SendClass3_Message</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 20</td></tr><tr><td>4</td><td>bNG_SendClass3_Message</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 30</td></tr><tr><td>5</td><td>unSetClass3_MessageRequestData</td><td>Word (Unsigned)/Bit String [16-bit] (0.706)</td><td>VAR_GLOBAL</td><td>D1 000</td></tr><tr><td>6</td><td>unGetClass3_MessageResponseData</td><td>Word (Unsigned)/Bit String [16-bit] (0.706)</td><td>VAR_GLOBAL</td><td>D2 000</td></tr><tr><td>7</td><td>unSetRequestNo</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3 000</td></tr><tr><td>8</td><td>unGetErrorcode</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3 001</td></tr><tr><td>9</td><td>unGetStatusErrorcode</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3 002</td></tr><tr><td>10</td><td>unGetResponseDataSize</td><td>Word (Unsigned)/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3 003</td></tr></tbody></table> <div>Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOVAL_RETAIN. For the latch setting, refer to the following.</div> <div> MELSEC iQ-F FX5 User's Manual (Application)</div> <div>For the response data storage location, refer to the manuals of the EtherNet/IP devices as the server and secure the sufficient data size.</div>				Label Name	Data Type	Class	Assign (Device/Label)	1	bClass3_MessageCommandSendReq	Bit	VAR_GLOBAL	M1 00	2	bRun_SendClass3_Message	Bit	VAR_GLOBAL	M1 10	3	bOK_SendClass3_Message	Bit	VAR_GLOBAL	M1 20	4	bNG_SendClass3_Message	Bit	VAR_GLOBAL	M1 30	5	unSetClass3_MessageRequestData	Word (Unsigned)/Bit String [16-bit] (0.706)	VAR_GLOBAL	D1 000	6	unGetClass3_MessageResponseData	Word (Unsigned)/Bit String [16-bit] (0.706)	VAR_GLOBAL	D2 000	7	unSetRequestNo	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 000	8	unGetErrorcode	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 001	9	unGetStatusErrorcode	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 002	10	unGetResponseDataSize	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 003
	Label Name	Data Type	Class	Assign (Device/Label)																																																						
1	bClass3_MessageCommandSendReq	Bit	VAR_GLOBAL	M1 00																																																						
2	bRun_SendClass3_Message	Bit	VAR_GLOBAL	M1 10																																																						
3	bOK_SendClass3_Message	Bit	VAR_GLOBAL	M1 20																																																						
4	bNG_SendClass3_Message	Bit	VAR_GLOBAL	M1 30																																																						
5	unSetClass3_MessageRequestData	Word (Unsigned)/Bit String [16-bit] (0.706)	VAR_GLOBAL	D1 000																																																						
6	unGetClass3_MessageResponseData	Word (Unsigned)/Bit String [16-bit] (0.706)	VAR_GLOBAL	D2 000																																																						
7	unSetRequestNo	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 000																																																						
8	unGetErrorcode	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 001																																																						
9	unGetStatusErrorcode	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 002																																																						
10	unGetResponseDataSize	Word (Unsigned)/Bit String [16-bit]	VAR_GLOBAL	D3 003																																																						
FB to be used	• M+FX5-EIP_Class3Originator_MessageSend																																																									



- (0) Set the request number for Class3 message communications, and start EtherNet/IP communications.
- (13) By turning on M100, "M+FX5-EIP_Class3Originator_MessageSend" is executed and the request data is transmitted to the server side. When M120 is on, the response result from the server side is stored in D2000 onwards. (Half of the response data size stored in D3003 (bytes) is stored (rounded up).)
If the response data size is an odd number, only the lower 1 byte of the end device is stored.



Ensure that the request number to be set is not the same as the request number used for other UCMM communications, Class1 communications, and Class3 communications.

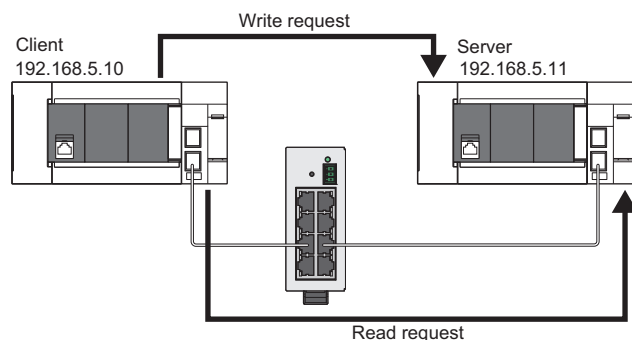
8.6 Example of Class3 Tag Communications

This section describes examples of executing Class3 tag communications between FX5-EIP modules.

System configuration

The following system configuration is used for examples of Class3 tag communications.

"Maximum Number of Connections Setting" of each FX5-EIP is assumed to be set to 64.



■Write request

- Tag name: Tag001
- Tag type: INT
- Size: 10 + Request data (10 words)

■Read request

- Tag name: Tag002
- Tag type: DINT
- Size: 10

Communication description

When the communication example for Class3 tag communications is executed, the following operation is performed.

Client-side operation

■Write request to tags

By executing a Class3 tag communication Write request, the device area data stored from D1000 onwards is written to the Tag001 tag on the server side according to the requested size. ^{*1}

^{*1} If the requested data type is INT (00C3H), request data consisting of the request data size × 1 word (10 words in the program example) is transmitted.

If the requested data type is DINT (00C4H), request data consisting of the request data size × 2 words is transmitted.

■Tag read request

By executing a Class3 tag communication Read request, the data set to the Tag002 tag on the server side is read according to the requested size. From the read data, the number of read data size (stored in D3204) is stored from D2000 onwards.

(Regardless of the tag data type of the external device, the received read data size is stored in units of words.)

In addition, the size of the data read from the tag of the external device depends on the external device tag data type. ^{*1}

^{*1} If the external device tag data type is INT (00C3H), the read request data size × 1 word is read.

If the external device tag data type is DINT (00C4H), the read request data size × 2 word is read.

Server-side operation

The current values of the tag data set in Tag001 and Tag002 are read and the current values are updated.

During server-side operation, both read and write requests from the client side for the tag can be accepted.

However, if the data is updated due to a write request while the current value is being read, or if the data currently being updated is read due to a read request, it may result in a data inconsistency.

Parameter settings

Use the engineering tool to set the parameters.

Point

In the program examples, default values are used for settings other than parameters shown in the setting procedure. For the parameters, refer to the following.

☞ Page 89 PARAMETER SETTINGS

FX5-EIP (client) settings

Connect the engineering tool to the client-side CPU module and set the parameters.

1. Set the CPU module as follows.

☞ Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 5 . 10
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	. . .
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.5.10

Subnet mask: 255.255.255.0

2. Click the [Apply] button.

3. Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

☞ [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

4. From "Module List", add "FX5-EIP" to the list of EtherNet/IP devices.

Point

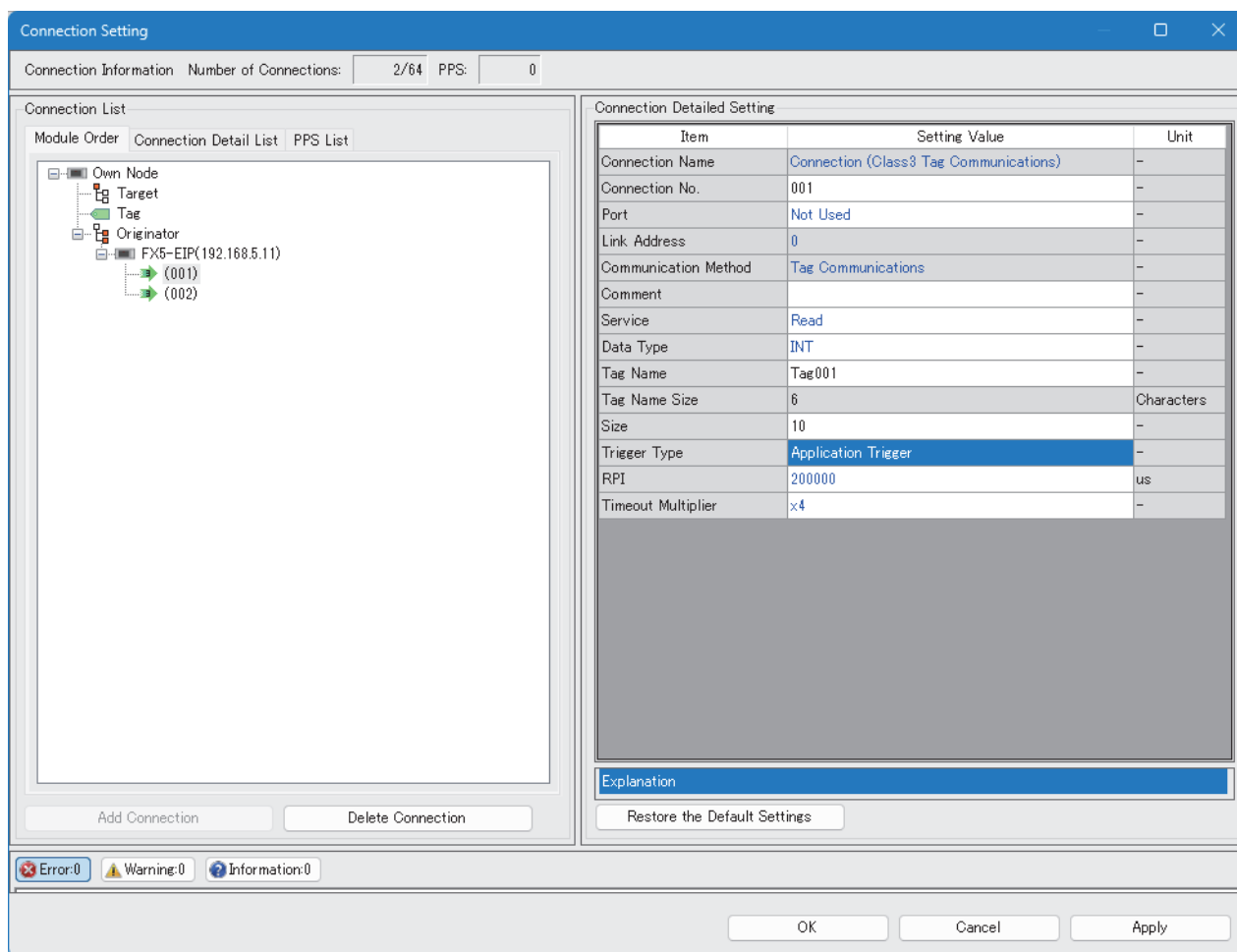
If "FX5-EIP" is not shown in the "Module List", the EDS file needs to be added.

For adding the EDS file, refer to the following.

☞ Page 122 Adding/deleting the EDS file

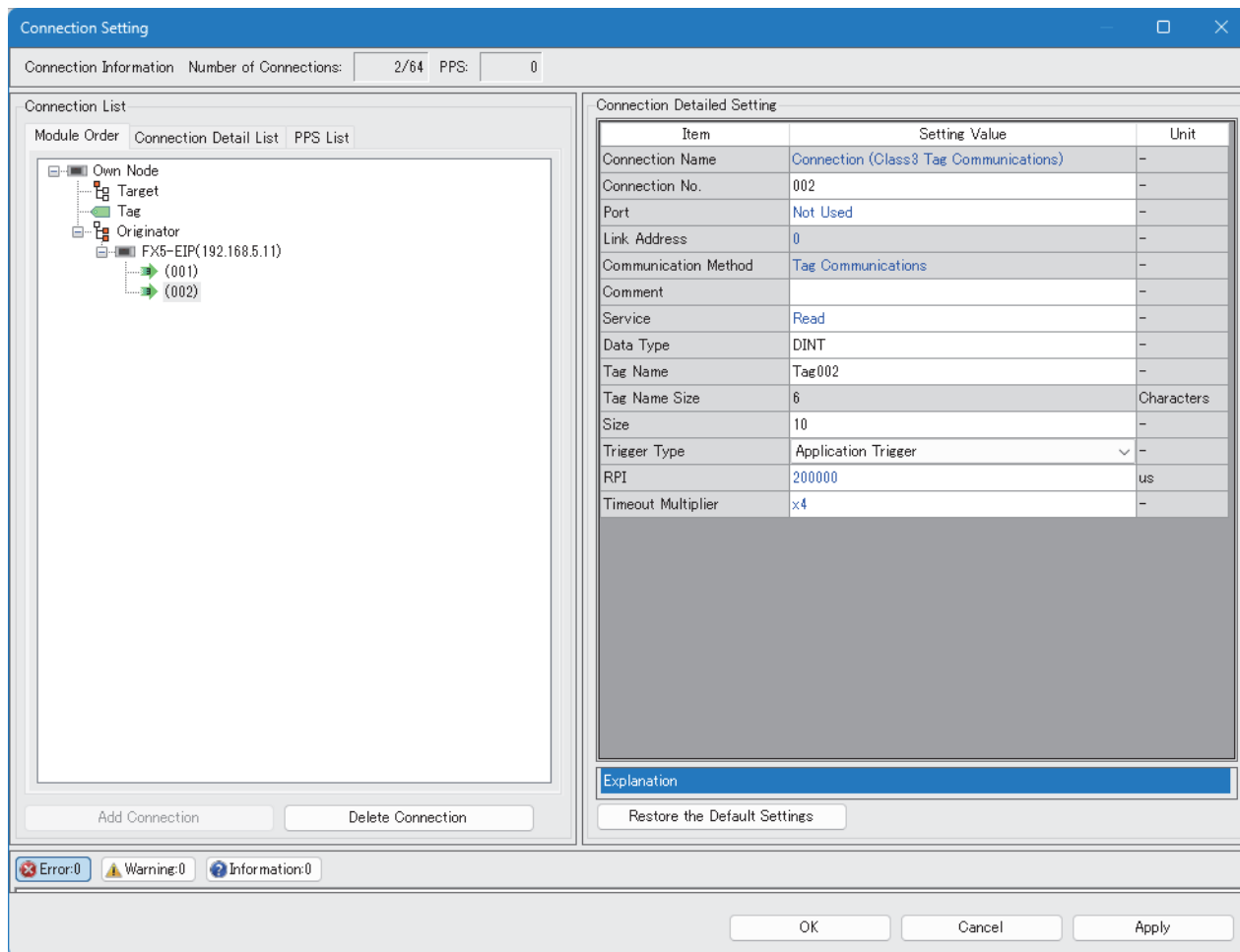
5. Double-click <Detailed Setting> in the "Connection Setting" column and set the tags for connection number 1 and connection number 2.

- Tag setting (Connection number 1)



- When adding a connection, select "Tag" and [Connections (Class3 Tag Communications)].
- Service: Write
- Data type: INT (1 word)
- Tag name: Tag001
- Size: 10

- Tag setting (Connection number 2)



- When adding a connection, select "Tag" and [Connections (Class3 Tag Communications)].
- Service: Read
- Data type: DINT (2 word)
- Tag name: Tag002
- Size: 10

6. Click the [Apply] button.

7. Click the [OK] button to close the connection settings.

8. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

9. Write the set parameters to the client-side CPU module. Then reset the CPU module or power off and on the system.

[Online] ⇒ [Write to PLC]

FX5-EIP (server) settings

Connect the engineering tool to the server-side CPU module and set the parameters.

1. Set the CPU module as follows.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 5 . 11
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.5.11

Subnet mask: 255.255.255.0

2. Click the [Apply] button.

3. Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [EtherNet/IP Configuration (Module Extended Parameter)]

4. Double-click <Detailed Setting> in the "Connection Setting" column and set the tags for connection number 1 and connection number 2.

- Tag setting (Connection number 1)

Connection Setting

Connection Information Number of Connections: 2/64 PPS: 0

Connection List

Module Order Connection Detail List PPS List

Own Node

- Target
- Tag
 - (001)
 - (002)
- Originator

Connection Detailed Setting

Item	Setting Value	Unit
Connection Name	Connection (Class3/UCMM Tag)	-
Connection No.	001	-
Comment		-
Data Type	INT	-
Tag Name	Tag001	-
Tag Name Size	6	Characters
Size	10	-

Explanation

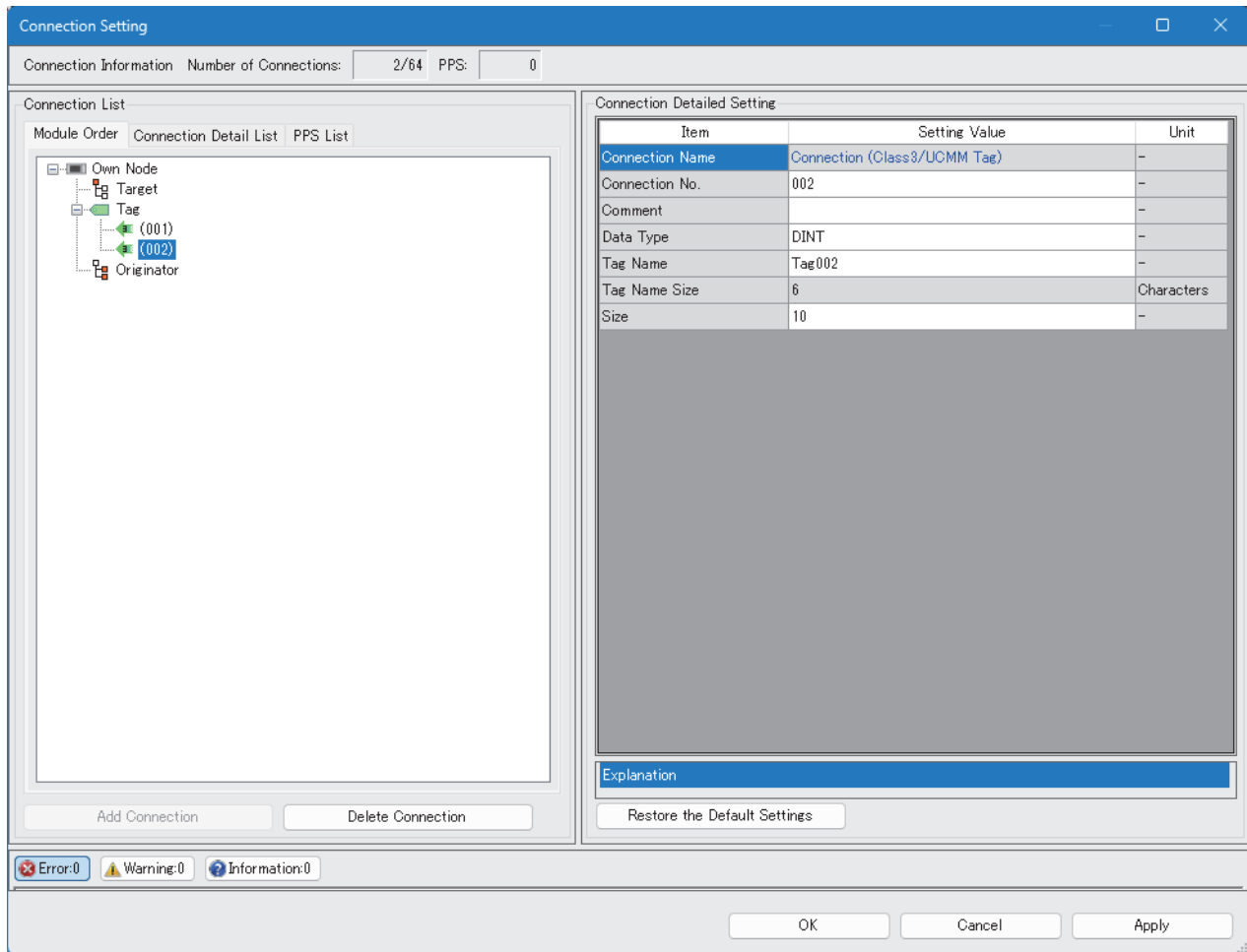
Add Connection Delete Connection Restore the Default Settings

Error:0 Warning:0 Information:0

OK Cancel Apply

- When adding a connection, select "Tag" and [Connection (Class3/UCMM Tag)].
- Tag data type: INT (1 word)
- Tag name: Tag001
- Size: 10

- Tag setting (Connection number 2)



- When adding a connection, select "Tag" and [Connection (Class3/UCMM Tag)].
- Tag data type: DINT (2 word)
- Tag name: Tag002
- Size: 10

5. Click the [Apply] button.

6. Click the [OK] button to close the connection settings.

7. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

8. Write the set parameters to the server-side CPU module. Then reset the CPU module or power off and on the system.

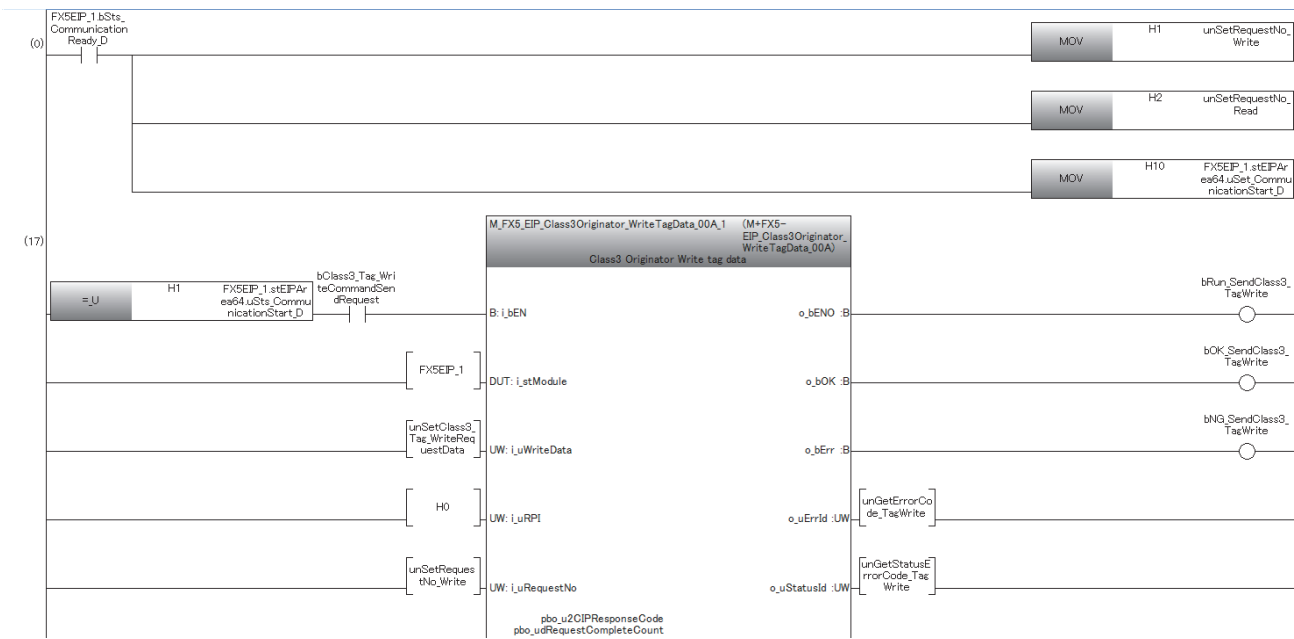
 [Online] ⇌ [Write to PLC]

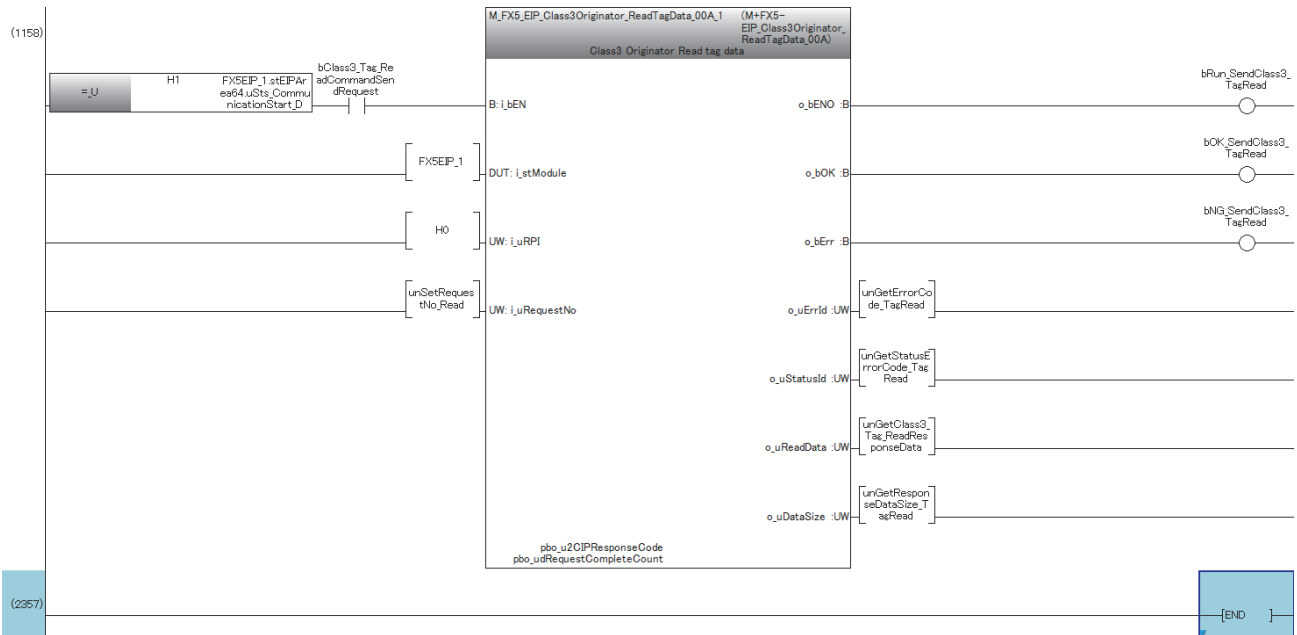
Program example

The Class3 tag communications program is executed by changing the CPU module from STOP to RUN.

Client-side program

Classification	Label name	Description	Device																																																																																										
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																																																																																										
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																																																																																										
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																																																																																										
Label to be defined	Define global labels as shown below.																																																																																												
	<table><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>bClass3_Tag_WriteCommandSendR</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 00</td></tr><tr><td>2</td><td>bClass3_Tag_ReadCommandSendR</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 01</td></tr><tr><td>3</td><td>bRun_SendClass3_TagWrite</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 10</td></tr><tr><td>4</td><td>bOK_SendClass3_TagWrite</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 20</td></tr><tr><td>5</td><td>bNG_SendClass3_TagWrite</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 30</td></tr><tr><td>6</td><td>bRun_SendClass3_TagRead</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 11</td></tr><tr><td>7</td><td>bOK_SendClass3_TagRead</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 21</td></tr><tr><td>8</td><td>bNG_SendClass3_TagRead</td><td>Bit</td><td>VAR_GLOBAL</td><td>M1 31</td></tr><tr><td>9</td><td>unSetClass3_Tag_WriteRequestData</td><td>Word (Unsigned)/Bit String (16-bit)(0..706)</td><td>VAR_GLOBAL</td><td>D1 000</td></tr><tr><td>10</td><td>unGetClass3_Tag_ReadResponseData</td><td>Word (Unsigned)/Bit String (16-bit)(0..706)</td><td>VAR_GLOBAL</td><td>D2 000</td></tr><tr><td>11</td><td>unSetRequestNo_Write</td><td>Word (Unsigned)/Bit String (16-bit)</td><td>VAR_GLOBAL</td><td>D31 00</td></tr><tr><td>12</td><td>unGetErrorCode_TagWrite</td><td>Word (Unsigned)/Bit String (16-bit)</td><td>VAR_GLOBAL</td><td>D31 01</td></tr><tr><td>13</td><td>unGetStatusErrorCode_TagWrite</td><td>Word (Unsigned)/Bit String (16-bit)</td><td>VAR_GLOBAL</td><td>D31 02</td></tr><tr><td>14</td><td>unSetRequestNo_Read</td><td>Word (Unsigned)/Bit String (16-bit)</td><td>VAR_GLOBAL</td><td>D32 00</td></tr><tr><td>15</td><td>unGetErrorCode_TagRead</td><td>Word (Unsigned)/Bit String (16-bit)</td><td>VAR_GLOBAL</td><td>D32 01</td></tr><tr><td>16</td><td>unGetStatusErrorCode_TagRead</td><td>Word (Unsigned)/Bit String (16-bit)</td><td>VAR_GLOBAL</td><td>D32 02</td></tr><tr><td>17</td><td>unGetResponseDataSize_TagRead</td><td>Word (Unsigned)/Bit String (16-bit)</td><td>VAR_GLOBAL</td><td>D32 04</td></tr></tbody></table>				Label Name	Data Type	Class	Assign (Device/Label)	1	bClass3_Tag_WriteCommandSendR	Bit	VAR_GLOBAL	M1 00	2	bClass3_Tag_ReadCommandSendR	Bit	VAR_GLOBAL	M1 01	3	bRun_SendClass3_TagWrite	Bit	VAR_GLOBAL	M1 10	4	bOK_SendClass3_TagWrite	Bit	VAR_GLOBAL	M1 20	5	bNG_SendClass3_TagWrite	Bit	VAR_GLOBAL	M1 30	6	bRun_SendClass3_TagRead	Bit	VAR_GLOBAL	M1 11	7	bOK_SendClass3_TagRead	Bit	VAR_GLOBAL	M1 21	8	bNG_SendClass3_TagRead	Bit	VAR_GLOBAL	M1 31	9	unSetClass3_Tag_WriteRequestData	Word (Unsigned)/Bit String (16-bit)(0..706)	VAR_GLOBAL	D1 000	10	unGetClass3_Tag_ReadResponseData	Word (Unsigned)/Bit String (16-bit)(0..706)	VAR_GLOBAL	D2 000	11	unSetRequestNo_Write	Word (Unsigned)/Bit String (16-bit)	VAR_GLOBAL	D31 00	12	unGetErrorCode_TagWrite	Word (Unsigned)/Bit String (16-bit)	VAR_GLOBAL	D31 01	13	unGetStatusErrorCode_TagWrite	Word (Unsigned)/Bit String (16-bit)	VAR_GLOBAL	D31 02	14	unSetRequestNo_Read	Word (Unsigned)/Bit String (16-bit)	VAR_GLOBAL	D32 00	15	unGetErrorCode_TagRead	Word (Unsigned)/Bit String (16-bit)	VAR_GLOBAL	D32 01	16	unGetStatusErrorCode_TagRead	Word (Unsigned)/Bit String (16-bit)	VAR_GLOBAL	D32 02	17	unGetResponseDataSize_TagRead	Word (Unsigned)/Bit String (16-bit)	VAR_GLOBAL	D32 04
	Label Name	Data Type	Class	Assign (Device/Label)																																																																																									
1	bClass3_Tag_WriteCommandSendR	Bit	VAR_GLOBAL	M1 00																																																																																									
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6	bRun_SendClass3_TagRead	Bit	VAR_GLOBAL	M1 11																																																																																									
7	bOK_SendClass3_TagRead	Bit	VAR_GLOBAL	M1 21																																																																																									
8	bNG_SendClass3_TagRead	Bit	VAR_GLOBAL	M1 31																																																																																									
9	unSetClass3_Tag_WriteRequestData	Word (Unsigned)/Bit String (16-bit)(0..706)	VAR_GLOBAL	D1 000																																																																																									
10	unGetClass3_Tag_ReadResponseData	Word (Unsigned)/Bit String (16-bit)(0..706)	VAR_GLOBAL	D2 000																																																																																									
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	📖 MELSEC iQ-F FX5 User's Manual (Application)																																																																																												
FBs to be used	• M+FX5-EIP_Class3Originator_WriteTagData • M+FX5-EIP_Class3Originator_ReadTagData																																																																																												





- (0) Set the request number for Class3 tag communications, and start EtherNet/IP communications.
- (17) By turning on M100, "M+FX5-EIP_Class3Originator_WriteTagData" is executed and a Write request is transmitted to the server side.
When M120 is on, the data stored from D1000 onwards in the set size are written to Tag001 on the server as parameters for Class 3 communications.
- (1158) By turning on M101, "M+FX5-EIP_Class3Originator_ReadTagData" is executed and a Read request is transmitted to the server side.
When M121 is on, the server-side response result is stored from D2000 onwards according to the response data size stored in D3204.

Point

Ensure that the request number to be set is not the same as the request number used for other UCMM communications, Class1 communications, and Class3 communications.

Server-side program

Classification	Label name	Description	Device
Module label	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273
	FX5EIP_1.stEIPArea64.unVal_InputDataSize_Connection_D[unReadWrite_ConnectionNo]	Input data size	U1\G304 to U1\G367
	FX5EIP_1.stEIPArea64.unVal_OutputDataSize_Connection_D[unReadWrite_ConnectionNo]	Output/message communication (server) data size	U1\G432 to U1\G495
	FX5EIP_1.stEIPArea64.stnAreaInputDataArea64[unReadWrite_ConnectionNo].unInputData	Input data area	U1\G16944 to U1\G63151
	FX5EIP_1.stEIPArea64.stnAreaOutputDataArea64[unReadWrite_ConnectionNo].unOutputData	Output/message communication (server) data area	U1\G63152 to U1\G109359

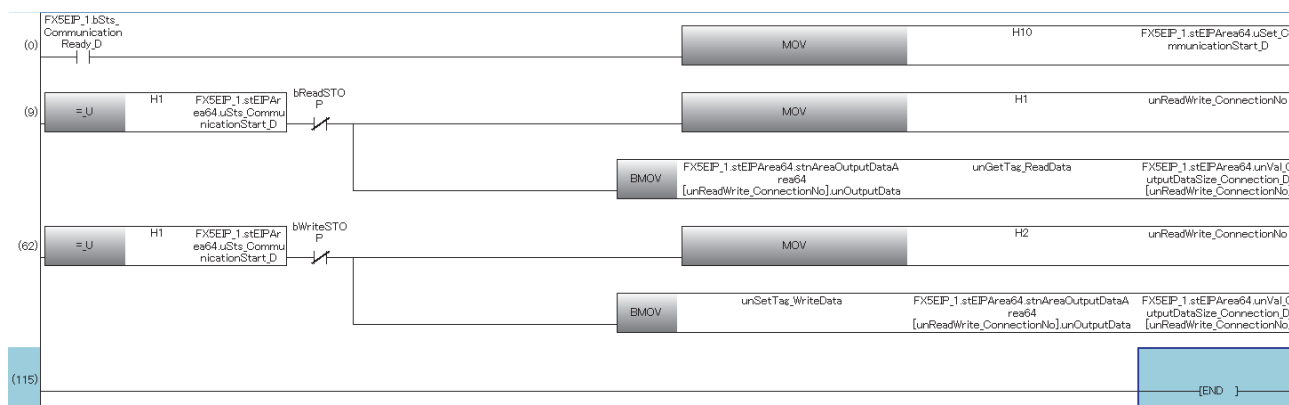
Label to be defined

Define global labels as shown below.

	Label Name	Data Type	Class	Assign (Device/Label)
1	bReadSTOP	Bit	VAR_GLOBAL	M11
2	bWriteSTOP	Bit	VAR_GLOBAL	M12
3	unReadWrite_ConnectionNo	Word [Signed]	VAR_GLOBAL	D300
4	unSetTag_WriteData	Word [Unsigned]/Bit String [16-bit](0.721)	VAR_GLOBAL	D1000
5	unGetTag_ReadData	Word [Unsigned]/Bit String [16-bit](0.721)	VAR_GLOBAL	D2000

Conversion is not possible with the default latch range depending on the CPU module. In such a case, change the latch range of the data register (D) or define the class of the label assigned with the data register (D) as VAR_GLOVAL_RETAIN. For the latch setting, refer to the following.

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- (0) Start EtherNet/IP communications.
- (9) Specify the connection number set for the tag with which to read the current value, and copy the data set for the specified tag to D2000.
- (62) Specify the connection number set for the tag with which to update the current value, and update the data set for the specified tag to the data set in D1000.

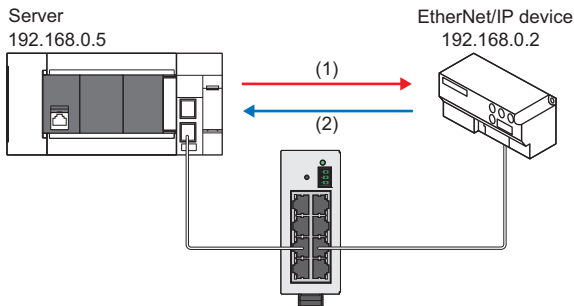
8.7 Program Example of PING Test

This section describes a program example of PING tests.

System configuration

The following system configuration is used for the program example of PING test.

"Maximum Number of Connections Setting" of each FX5-EIP is assumed to be set to 64.



- (1) Echo request
(2) Echo response

Communication description

The PING test is used to check that the FX5-EIP can receive an echo response from an EtherNet/IP device by transmitting an echo request from the FX5-EIP to EtherNet/IP device.

For the PING test, the buffer memory of the FX5-EIP is used to operate the program.

The following table lists the buffer memory used by the PING test.

Address	Item		Reference
Un\G240	PING test request area	Communication time check	Page 236 PING test request area
Un\G241		Transmission count	
Un\G242 to Un\G243		IP Address	
Un\G244	PING test response area	Total packet transmission count	Page 236 PING test response area
Un\G245		Receive count	
Un\G246		Loss count	
Un\G247 to Un\G256		Error code	

Parameter settings

Connect the engineering tool to the CPU module and set the parameters.

1. Set the IP address.

Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Module Parameter] ⇒ [Basic Settings]

Setting Item	
Item	Setting
Own Node Settings	
IP Address Setting	
IP Address	192 . 168 . 0 . 5
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	.
Communication Data Code	Binary
Opening Method	Do Not Open by Program

IP address: 192.168.0.5

Subnet mask: 255.255.255.0

2. Click the [Apply] button.

3. Write the set parameters to the CPU module. Then reset the CPU module or power off and on the system.

[Online] ⇒ [Write to PLC]



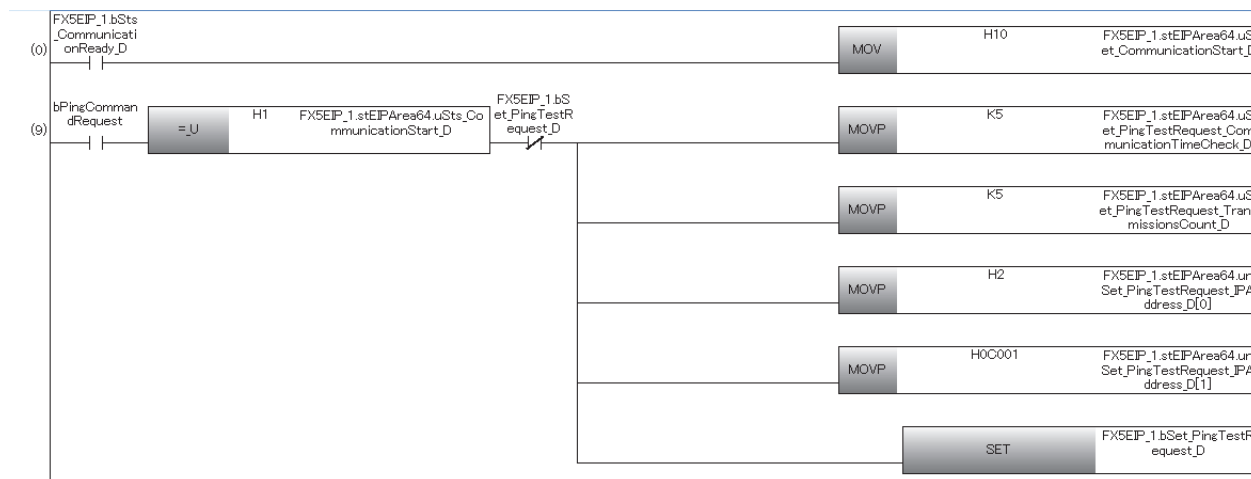
In the program examples, default values are used for settings other than parameters shown in the procedure above. For the parameters, refer to the following.

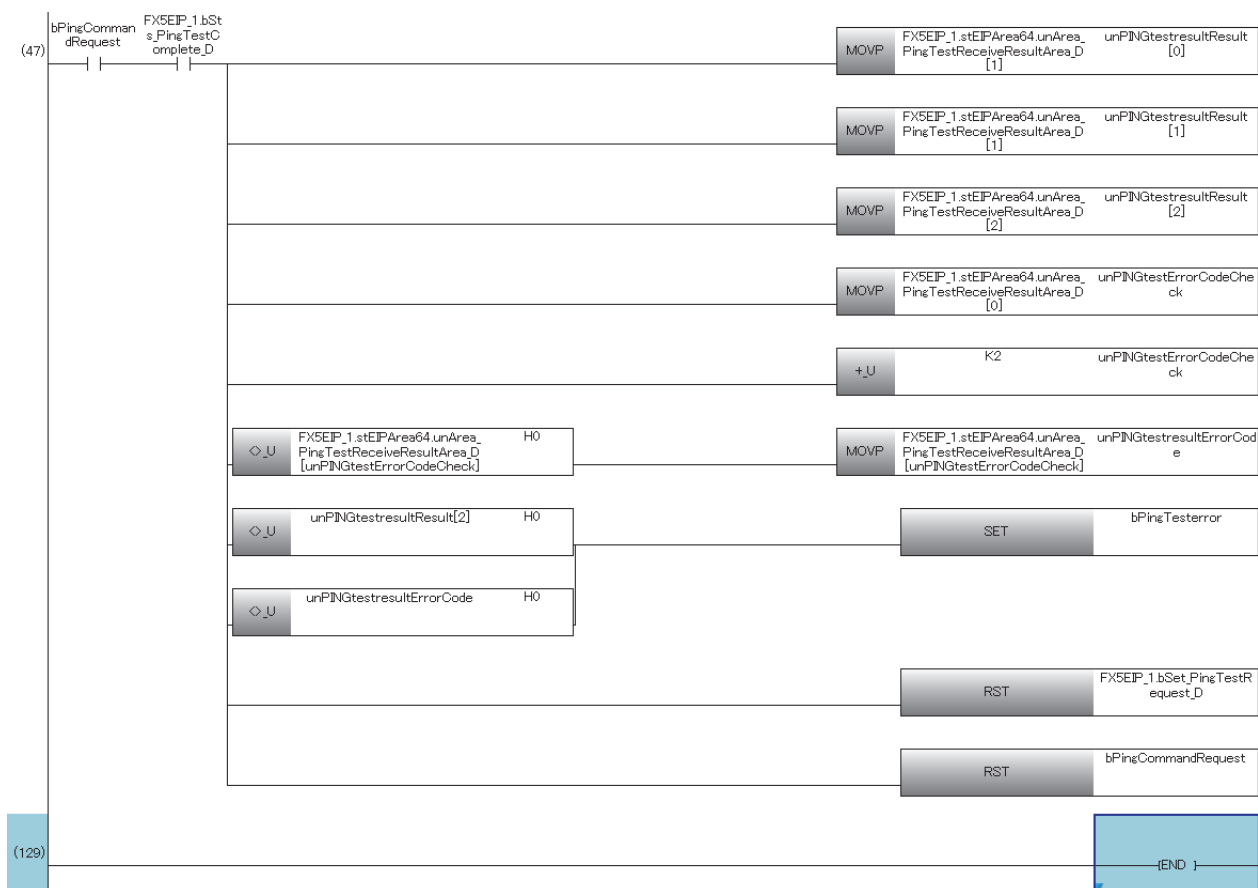
Page 89 PARAMETER SETTINGS

Program example

The following example shows a program to execute the PING test by turning on the PING test request command.

Classification	Label name	Description	Device																														
Module label	FX5EIP_1.bSts_PingTestComplete_D	PING test completion	U1\G35.2																														
	FX5EIP_1.bSts_CommunicationReady_D	Communication Ready	U1\G35.F																														
	FX5EIP_1.bSet_PingTestRequest_D	PING test execution request	U1\G37.2																														
	FX5EIP_1.stEIPArea64.uSet_PingTestRequest_CommunicationTimeCheck_D	PING test request area communication time check	U1\G240																														
	FX5EIP_1.stEIPArea64.uSet_PingTestRequest_TransmissionsCount_D	PING test request area transmission count	U1\G241																														
	FX5EIP_1.stEIPArea64.unSet_PingTestRequest_IPAddress_D[0]	PING test request area IP Address	U1\G242																														
	FX5EIP_1.stEIPArea64.unSet_PingTestRequest_IPAddress_D[1]	PING test request area IP Address	U1\G243																														
	FX5EIP_1.stEIPArea64.unArea_PingTestReceiveResultArea_D[0]	PING test response result area total packet transmission count	U1\G244																														
	FX5EIP_1.stEIPArea64.unArea_PingTestReceiveResultArea_D[1]	PING test response result area receive count	U1\G245																														
	FX5EIP_1.stEIPArea64.unArea_PingTestReceiveResultArea_D[2]	PING test response result area loss count	U1\G246																														
	FX5EIP_1.stEIPArea64.unArea_PingTestReceiveResultArea_D[unPINGtest ErrorCodeCheck]	PING test response result area error code	U1\G247 to U1\G256																														
	FX5EIP_1.stEIPArea64.uSet_CommunicationStart_D	EtherNet/IP communication start request	U1\G272																														
	FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D	EtherNet/IP communication start status	U1\G273																														
Label to be defined	Define global labels as shown below.																																
<table><tr><th></th><th>Label Name</th><th>Data Type</th><th>Class</th><th>Assign (Device/Label)</th></tr><tr><td>1</td><td>bPingCommandRequest</td><td>Bit</td><td>VAR_GLOBAL</td><td>M0</td></tr><tr><td>2</td><td>unPINGtestResult</td><td>Word [Unsigned]/Bit String [16-bit](0.2)</td><td>VAR_GLOBAL</td><td>D3000</td></tr><tr><td>3</td><td>unPINGtestErrorCodeCheck</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3003</td></tr><tr><td>4</td><td>unPINGtestResultError</td><td>Word [Unsigned]/Bit String [16-bit]</td><td>VAR_GLOBAL</td><td>D3004</td></tr><tr><td>5</td><td>bPingTestError</td><td>Bit</td><td>VAR_GLOBAL</td><td>F0</td></tr></table>					Label Name	Data Type	Class	Assign (Device/Label)	1	bPingCommandRequest	Bit	VAR_GLOBAL	M0	2	unPINGtestResult	Word [Unsigned]/Bit String [16-bit](0.2)	VAR_GLOBAL	D3000	3	unPINGtestErrorCodeCheck	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3003	4	unPINGtestResultError	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3004	5	bPingTestError	Bit	VAR_GLOBAL	F0
	Label Name	Data Type	Class	Assign (Device/Label)																													
1	bPingCommandRequest	Bit	VAR_GLOBAL	M0																													
2	unPINGtestResult	Word [Unsigned]/Bit String [16-bit](0.2)	VAR_GLOBAL	D3000																													
3	unPINGtestErrorCodeCheck	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3003																													
4	unPINGtestResultError	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	D3004																													
5	bPingTestError	Bit	VAR_GLOBAL	F0																													
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📖 MELSEC iQ-F FX5 User's Manual (Application)																																	





- (0) Start EtherNet/IP communications.
- (9) Specify the communication time check, the transmission count, and the IP address for the PING test, and then start the test.
- (47) The PING test response result is stored. (Total number of packet transmissions → D3000, receive count → D3001, loss count → D3002, error code → D3004)
- If a timeout or an error occurs, F0 turns on.

9 TROUBLESHOOTING

This chapter describes errors that may occur during communication between the FX5-EIP and other devices, and troubleshooting for such errors.

9.1 Checking with LEDs

This section describes troubleshooting using the LEDs.

When the RUN LED turns off

When the RUN LED turns off after the FX5-EIP is powered on, check the following.

Check item	Action
Is the FX5-EIP connected correctly?	If not, properly connect the FX5-EIP to the CPU module.

If the above actions do not solve the problem, perform the hardware test to check for FX5-EIP failure. (➡ Page 186 Hardware 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 in the module diagnostics. (➡ Page 180 Module diagnostics)

When the MS LED is flashing in green

When the MS LED is flashing in green, check the following.

Check item	Action
Are the parameters set in "EtherNet/IP Configuration"?	If not, set the parameters in "EtherNet/IP Configuration".
Are the parameters written correctly?	<ul style="list-style-type: none">• Check if an error has occurred during writing to the programmable controller.• Re-write the parameters.

When the MS LED turns on in red or is flashing in red

When the MS LED turns on in red or is flashing in red, check the following.

Check item	Action
Does any error occur in the module diagnostics?	Take the actions displayed in the module diagnostics. (➡ Page 180 Module diagnostics)

When the NS LED is flashing in green

When the NS LED is flashing in green, check the following. ^{*1}

Check item	Action
Are the values in the following buffer memory areas set correctly? <ul style="list-style-type: none"> • 'Cyclic communication status' (Un\G1328 to Un\G1351) • 'Cyclic communication connection error status' (Un\G1392 to Un\G1903) 	Take the action corresponding to the value of 'Cyclic communication connection error status' (Un\G1392 to Un\G1903). ( Page 245 Cyclic communication pause status (Un\G1368 to Un\G1375))
Is 'EtherNet/IP communication start status' (Un\G273) set to 1 (Operating)?	<ul style="list-style-type: none"> • Check that a value other than 0 (Start request) is set for "EtherNet/IP communication start request" (Un\G272). • Write the module extension parameter if it is not written. • Check that 'Cyclic communication pause specification' (Un\G1360 to Un\G1367) is all set to 0 (No cyclic pause request).

^{*1} UCMM communications do not establish any connection. Therefore, the LED does not turn on in green when only UCMM communications are performed.

When the NS LED is flashing in red

When the NS LED is flashing in red, check the following.

Check item	Action
Is the EtherNet/IP device connected correctly?	<ul style="list-style-type: none"> • Check whether the operating status of the EtherNet/IP device is normal. ( Page 180 Module diagnostics) • Check for errors in the line status. • The line may be busy; try again later.

When the SD/RD LED does not turn on during data communication

When the SD/RD LED does not turn on during data communication, check the following.

Check item	Action
Is the ERROR LED on or flashing?	Take the actions displayed in the module diagnostics. ( Page 180 Module diagnostics)
Is the Ethernet cable connected correctly?	<ul style="list-style-type: none"> • Connect the Ethernet cable again. • Perform a PING test to check the line status. ( Page 185 PING test)
Are the parameter settings correct?	Correct the following details in "EtherNet/IP Configuration". <ul style="list-style-type: none"> • Model and name of the connected EtherNet/IP device • IP address of the connected EtherNet/IP device • Version of the registered EDS file
Are there any errors in the program?	<ul style="list-style-type: none"> • Check that 'EtherNet/IP communication start request' (Un\G272) is on. • Check and correct the data communication program.

If the above actions do not solve the problem, perform the hardware test to check for FX5-EIP failure. ( Page 186 Hardware Test)

9.2 Checking the Module Status

The status of the FX5-EIP module can be checked by the following methods.

- Module diagnostics
- Ethernet diagnostics
- Checking the buffer memory
- Event history function

Module diagnostics

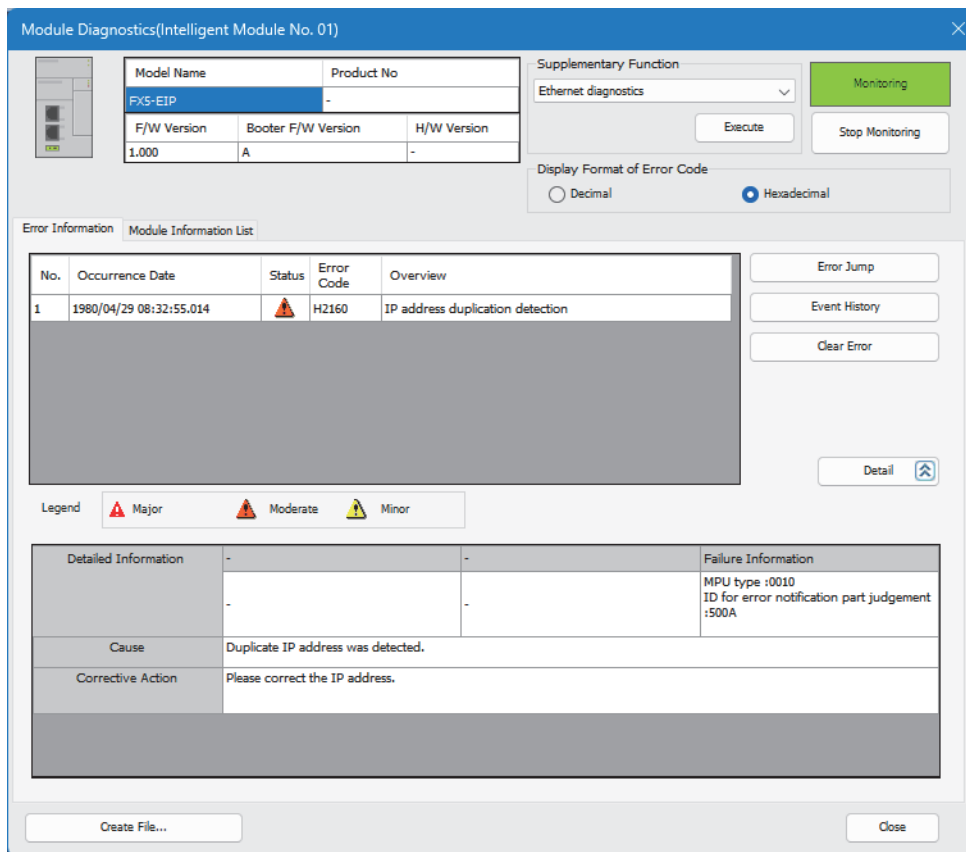
The following functions can be used in the "Module Diagnostics" window for the FX5-EIP.

Function	Application
Error Information	Displays the details of the errors currently occurring. Click the [Event History] button to check the history of errors that have occurred on the FX5-EIP and errors detected for each module.
Module Information List	Displays various status information of the FX5-EIP.

Error Information

Check the details of the error currently occurring and action to eliminate the error.

 Access [Diagnostic] ⇒ [System Monitor], and double-click "FX5-EIP".



Module Diagnostics(Intelligent Module No. 01)

Model Name: FX5-EIP, Product No: -

F/W Version: 1.000, Booter F/W Version: A, H/W Version: -

Supplementary Function: Ethernet diagnostics

Display Format of Error Code: ☐ Decimal ☒ Hexadecimal

No.	Occurrence Date	Status	Error Code	Overview
1	1980/04/29 08:32:55.014		H2160	IP address duplication detection

Legend:  Major  Moderate  Minor

Detailed Information	Failure Information
Cause	MPU type :0010 ID for error notification part judgement :500A
Corrective Action	

Buttons: Error Jump, Event History, Clear Error, Detail

Buttons: Create File..., Close

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.
Detailed Information	Displays detailed information about each error (maximum of three pieces).
Cause	Displays the detailed error causes.
Action	Displays the actions to eliminate the error causes.

Module Information List

Switch to the [Module Information List] tab to check various status information of the FX5-EIP.

Module Diagnostics(Intelligent Module No. 01)

Model Name FX5-EIP		Product No -
F/W Version 1.000	Booter F/W Version A	H/W Version -

Supplementary Function
Ethernet diagnostics

Execute Stop Monitoring

Display Format of Error Code
☐ Decimal
 ☒ Hexadecimal

Error Information Module Information List

Item	Content
LED information (Module)	
RUN	On: Normal operation
ERR.	Off: Normal operation
LED information (Network)	
MS	On(Green):Communication possible
NS	Blink(Green):Connection not established
Individual information	
Module Operation Mode	Online mode
IP address(1st octet)	192
IP address(2nd octet)	168
IP address(3rd octet)	4
IP address(4th octet)	250
Mac address(1st octet)	28
Mac address(2nd octet)	E9
Mac address(3rd octet)	8E
Mac address(4th octet)	7F
Mac address(5th octet)	5
Mac address(6th octet)	5

Create File... Close

Item		Description
LED information (Module)		Displays the status of the RUN LED and ERROR LED of the FX5-EIP.
LED information (Communication)*1		Displays the status of the MS LED and NS LED of the FX5-EIP.
Setting information*1	IP Address (1st Octet)	Displays the IP address of the FX5-EIP.
	IP Address (2nd Octet)	
	IP Address (3rd Octet)	
	IP Address (4th Octet)	
	MAC Address (1st Octet)	Displays the MAC address of the FX5-EIP.
	MAC Address (2nd Octet)	
	MAC Address (3rd Octet)	
	MAC Address (4th Octet)	
	MAC Address (5th Octet)	
	MAC Address (6th Octet)	

*1 An undefined value is stored during hardware test.

Checking the buffer memory

The buffer memory areas can be used to check for errors that have occurred in the FX5-EIP.

EtherNet/IP communication error

If an error occurs during cyclic communications, check the following.

📖 Page 183 Intelligent function module monitor

📖 Page 184 Device/buffer memory batch monitor

Module error

If an error occurs in the FX5-EIP, check the following buffer memory addresses.

Buffer memory address	Buffer memory name	Description
Un\G29	Latest error code	Stores the latest error code.
Un\G158	Initial status	This address allows checking whether the initialization is normally completed.

For the stored error code, refer to 📖 Page 217 List of Event Code.

Ethernet communication error

If an error occurs during standard Ethernet communication, the error code will be stored in the following buffer memory address.

Buffer memory address	Buffer memory name	Description
Un\G108 to Un\G139	Error code	Stores the error codes for each connection (1) to (32).

For the stored error code, refer to 📖 Page 217 List of Event Code.

Event history function

This function collects errors from the FX5-EIP, and keeps them in the SD memory card, and data memory or battery backed built-in RAM of the CPU module.

The event information collected by the CPU module can be displayed on GX Works3 to check the occurrence history in chronological order.

Event type	Classification	Description
System	Error	An error detected by the self diagnostics in the FX5-EIP.

For the stored error code, refer to 📖 Page 217 List of Event Code.

Setting procedure

The event history function can be set from the event history setting window of GX Works3. For the setting procedure, refer to the following.

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

Displaying event history

Access the menu of GX Works3. For details on the operating procedure and how to view the contents, refer to the following.

📖 GX Works3 Operating Manual

9.3 Checking the Network Status

Use the following methods to check the EtherNet/IP network status.

- Intelligent function module monitor
- Device/buffer memory batch monitor
- PING test

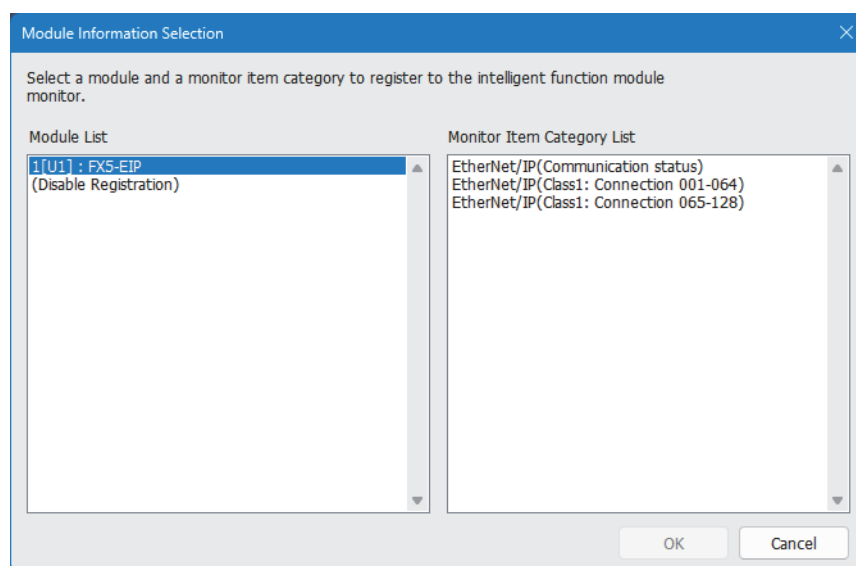
Intelligent function module monitor

Use "intelligent function module monitor" of the engineering tool to check the update status of cyclic communication.

Operating procedure

1. Register the FX5-EIP in the intelligent function module monitor to display the following window (module information selection).

 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ Right-click ⇒ [Register to Intelligent Function Module Monitor]



2. From "Monitor Item Category List", select the target item for monitoring, and click the [OK] button to display the intelligent function module monitor. The following table lists the content of each item in "Monitor Item Category List".

Monitor Item Category List	Description
EtherNet/IP (Communication status)	Displays the EtherNet/IP communication status such as auto refresh status and EtherNet/IP communication control.
EtherNet/IP (Class1: Connection 001-064)	Displays information such as cyclic communication input/output, communication status, and connection information, for connection setting numbers 001 to 064.
EtherNet/IP (Class1: Connection 065-128)	Displays information such as cyclic communication input/output, communication status, and connection information, for connection setting numbers 065 to 128.

Point

- For the Class1 connection information, monitor the information corresponding to the connection number specified as Class1 in "EtherNet/IP Configuration".
- When information on a connection number that is not specified as Class1 is monitored, an undefined value is displayed.

Device/buffer memory batch monitor

Cyclic communications are monitored by checking the following buffer memory areas.

Buffer memory address	Name	Description
Un\G1328 to Un\G1335	Data link status	Allows checking whether data link is performed on each connection.  Page 244 Cyclic communication status
Un\G1336 to Un\G1343	Error status	Allows checking for errors in each connection.  Page 244 Cyclic communication status
Un\G1392 to Un\G1903	Connection behavior error status	Allows checking the status of errors that occurred while data link is in operation.  Page 245 Connection behavior error status

Status of each connection

The connection status of each connection can be checked with 'Data link status' (Un\G1328 to Un\G1335) and 'Error status' (Un\G1336 to Un\G1343). The following table lists the connection status.

'Data link status' (Un\G1328 to Un\G1335)	'Error status' (Un\G1336 to Un\G1343)	Description
Off	Off	Not connected or data link not in operation
On	Off	Data link in operation. No error has occurred.
Off	On	Data link not in operation. An error has occurred.

Error details of each connection

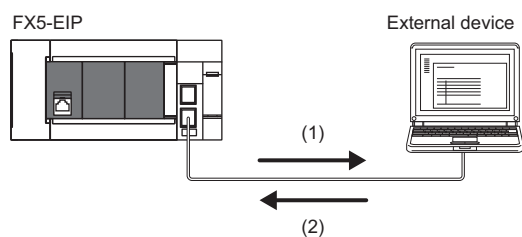
Error details on each connection can be checked with 'Connection error status' (Un\G1392 to Un\G1903).

 Page 200 Error codes when a connection error occurs

PING test

A PING test is used to check that an EtherNet/IP device exists on the same EtherNet/IP network.

The FX5-EIP transmits a packet to the EtherNet/IP device to check its existence (an echo request). Then, the FX5-EIP checks whether communication is possible by checking whether a response (an echo response) is returned.



- (1) Echo request
- (2) Echo response

The result of a PING test can be checked with 'PING test response area' (Un\G244 to Un\G256).

For PING tests, refer to the following.

📖 Page 174 Program Example of PING Test

For errors that occur in PING tests, refer to the following.

📖 Page 198 Error codes upon execution of a PING test

9.4 Hardware Test

This section describes how to perform a test related to hardware such as a ROM/RAM of the FX5-EIP.

Restriction

- During the hardware test, values in the buffer memory cannot be referred from GX Works3 or the program.
- Do not change the operating status of the CPU module during the hardware test. If the operating status of the CPU module is changed, the module major error occurs in the CPU module.

Operating procedure

1. Set the FX5-EIP to the hardware test mode using GX Works3.

 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Application Settings] ⇒ [Mode Settings] ⇒ [Communication Mode] ⇒ Select "Hardware Test".

2. When a cable is connected to the Ethernet port of the FX5-EIP, disconnect it.
3. Set the CPU module (FX5-EIP) to the STOP state and write parameters.
4. Power off and on the system or reset the CPU module (FX5-EIP).
5. The hardware test is automatically executed.

The following table lists the LED indications of the FX5-EIP for the hardware test.

Status	RUN LED	ERROR LED
During hardware test execution	Flashing	Off
Hardware test completed successfully	On	Off
Hardware test completed with an error	On	On

6. When the test completed successfully, set the FX5-EIP to online mode using GX Works3.

 Navigation window ⇒ [Parameter] ⇒ [Module Information] ⇒ [FX5-EIP] ⇒ [Application Settings] ⇒ [Mode Settings] ⇒ [Communication Mode] ⇒ Select "Online".

Write parameters and power off and on the system or reset the CPU module (FX5-EIP).

7. When the test completed with an error, check that adequate measures to reduce noise are taken for the programmable controller system and retry the hardware test. If the test still completes with an error, a hardware failure may have occurred on the FX5-EIP. Please contact your local Mitsubishi representative.

9.5 Troubleshooting by Symptom

The troubleshooting measures for each symptom during EtherNet/IP communication are shown below. If an error occurs in the FX5-EIP, identify the error cause using GX Works3. (☞ Page 180 Checking the Module Status)

Communications with EtherNet/IP devices cannot be performed

The following table lists the actions to be taken if communications with EtherNet/IP devices cannot be performed. If the problem cannot be solved, perform the hardware test to check for hardware failure. (☞ Page 186 Hardware Test)

Check item	Action
Is the RUN LED of the FX5-EIP off?	If the RUN LED is off, reset the CPU module. If the RUN LED does not turn on after resetting, a hardware failure may have occurred. Replace the FX5-EIP and restart the connected EtherNet/IP device.
Is the Ethernet cable connected correctly?	Connect the Ethernet cable again.
Is the EtherNet/IP device compatible with the FX5-EIP communication functions (cyclic communications and message communications)?	Check the specifications of the EtherNet/IP device.
Is the power supply of the EtherNet/IP device on?	Turn on the power supply of the EtherNet/IP device.
Has an error occurred in the EtherNet/IP device, industrial switch, or a similar device?	If an error occurs on the EtherNet/IP device, industrial switch, or a similar device, check the manual of each device.
Is the IP address setting of the EtherNet/IP device correct?	Perform a PING test to check the connection with the EtherNet/IP device. (☞ Page 185 PING test)
Is the mode setting of the FX5-EIP set to a value other than "Online"?	Set the mode setting of the FX5-EIP to "Online".
Has the initial processing been completed successfully? (Check 'Module Ready' (Un\G34.F) and 'Communication Ready' (Un\G35.F).)	Start communications after 'Module Ready' (Un\G34.F) and 'Communication Ready' (Un\G35.F) turn on.
Is 'EtherNet/IP communication start status' (Un\G273) set to 1 (Operating)?	<ul style="list-style-type: none"> Check that a value other than 0 (Start request) is set for 'EtherNet/IP communication start request' (Un\G272). Write the module extension parameter if it is not written. Check that 'Cyclic communication pause specification' (Un\G1360 to Un\G1367) is all set to 0 (No cyclic pause request).
Has a timeout error occurred on the connection that performs communications normally?	Depending on the EtherNet/IP device used, the connection that performs communications normally may be disconnected and a timeout error may occur after the time specified by Encapsulation Inactivity Timeout has elapsed. Therefore, set Encapsulation Inactivity Timeout to "0 (invalid)". (☞ Page 261 TCP/IP Interface)
Has the number of currently active connections with the target EtherNet/IP device reached the maximum number of consumed connections?	<ul style="list-style-type: none"> If the FX5-EIP is the target, set the system configuration so that the number of communication connections is equal to or less than the maximum number of consumed connections.*1 If the FX5-EIP is an originator, set the system configuration so that the number of communication connections including the own node is equal to or less than the maximum number of consumed connections.
Are there duplicate IP addresses on the network?	<ul style="list-style-type: none"> If a node with a duplicate IP address exists on the network, communication cannot start normally. Therefore, remove the node with the duplicate IP address from the network. When IP address duplication occurs during communication, the industrial switch may relay the line data to the node with the duplicate IP address, which may cause the line data to temporarily stop arriving or the communication to stop. If communication does not restart even after removing the node with the duplicate IP address from the network, reconnect the own node.
Are communications from an IP address of an external device blocked due to incorrect IP filter settings?	Change the parameters of the IP filter settings to allow communications with the IP address of the external device.

*1 The number of connections used by the FX5-EIP can be checked in 'Number of consumed connections' (Un\G110116).

Tag communications failed

The following table lists the actions to be taken if tag communications cannot be performed.

Check item	Action
Has communication start processing been performed correctly with 'EtherNet/IP communication start request' (Un\G272)?	Set 'EtherNet/IP communication start request' (Un\G272) to "Other than 0: Start request".
Has the connection destination EtherNet/IP device been registered in "EtherNet/IP Configuration"?	When performing Class1 communications and Class3 communications, if the connection destination EtherNet/IP device has not been registered in "EtherNet/IP Configuration", register it and write the parameters again.
Is the tag name specified correctly?	Check that the tag name set to the FX5-EIP and the tag name set to the external device match. If they do not match, correct the tag names and write the parameters again.

■Class1 tag communications failed

The following table lists the actions to be taken if Class1 tag communications cannot be performed.

Check item	Action
When the FX5-EIP is an originator, has the external device already performed multicast communication with other originators?	<ul style="list-style-type: none"> Match the settings of the FX5-EIP with those of other originators that are being communicated with.*1 Match the settings of other originators that are being communicated with the external device with those of the FX5-EIP. Correct the system configuration so that the external device communicates only with the own node.

*1 Match all of the following connection settings: RPI, connection type, data size, trigger type, instance ID (or tag name), and priority.

■Class3 tag communications failed

The following table lists the actions to be taken if Class3 tag communications cannot be performed.

Check item	Action
Are the settings in "EtherNet/IP Configuration" correct?	Check the values set in "EtherNet/IP Configuration". When the following module function blocks are used, check the values set for the arguments. <ul style="list-style-type: none"> Class3Originator_ReadTagData Class3Originator_WriteTagData
Is the tag data type specified correctly?	Check that the data type of the tag set to the FX5-EIP and the data type of the tag set to the external device match. If they do not match, correct the tag data types and write the parameters again.
When the FX5-EIP is a client, is an area not available for Class3 used?	<ul style="list-style-type: none"> Check that "0002H: Class3" is set as the initial value for the communication type specification area of the message communication area*1. Check that an area with a connection number for which Class3 communications parameters are set in "EtherNet/IP Configuration" is used.
Is the Path Segment specification set correctly?	Check that the Path Segment specification in the request area of the message communication area*1 is set correctly. (☞ Page 248 Message communication request/response area)
When the FX5-EIP is a client, is the data in the response area of the message communication area correct?	Check the value for the result storage area of the message communication area*1. If the value is other than 0, check the error code and take an action. (☞ Page 214 Error codes for the message communication function (client))

*1 The buffer memory addresses in the message communication area differ depending on whether the module parameter "Maximum Number of Connections Setting" is set to "64 connections" or "128 connections". (☞ Page 251 Details of buffer memory addresses (data area G16944 to G109359 or G32560 to G109359))

■UCMM tag communications failed

The following table lists the actions to be taken if UCMM tag communications cannot be performed.

Check item	Action
Is the tag data type specified correctly?	Check that the data type of the tag set to the FX5-EIP and the data type of the tag set to the external device match. If they do not match, check the following. <ul style="list-style-type: none"> When the FX5-EIP is a client, correct the data type of the tag set in the buffer memory. When the FX5-EIP is a server, correct the data type of the tag set in "EtherNet/IP Configuration".
When the FX5-EIP is a client, are areas for Class1 communication parameters, Class3 communication parameters, and message communication (server function) tag communications used?	<ul style="list-style-type: none"> Check that "0001H: UCMM communications" is set as the initial value for the communication type specification area of the message communication area^{*1}. Check whether an area with a connection number for which Class3 communications parameters are set in "EtherNet/IP Configuration" is used.
Is the Path Segment specification set correctly?	Check that the Path Segment specification in the request area of the message communication area ^{*1} is set correctly. ( Page 248 Message communication request/response area)
When the FX5-EIP is a client, is the data in the response area of the message communication area correct?	When the FX5-EIP is a client, check the value for the result storage area of the message communication area ^{*1} . If the value is other than 0, check the error code and take an action. ( Page 214 Error codes for the message communication function (client))

*1 The buffer memory addresses in the message communication area differ depending on whether the module parameter "Maximum Number of Connections Setting" is set to "64 connections" or "128 connections". ( Page 251 Details of buffer memory addresses (data area G16944 to G109359 or G32560 to G109359))

Instance communications failed

The following table lists the actions to be taken if instance communications cannot be performed.

Check item	Action
Is 'EtherNet/IP communication start status' (Un\G273) set to 1 (Operating)?	<ul style="list-style-type: none"> Check that a value other than 0 (start request) is set for "EtherNet/IP communication start request" (Un\G272). Write the module extension parameter if it is not written. Check that 'Cyclic communication pause specification' (Un\G1360 to Un\G1367) is all set to 0 (No cyclic pause request).
Has the connection destination EtherNet/IP device been registered in "EtherNet/IP Configuration"?	When performing Class1 communications and Class3 communications, if the connection destination EtherNet/IP device has not been registered in "EtherNet/IP Configuration", register it and write the parameters again.

■Class1 instance communications failed

The following table lists the actions to be taken if Class1 instance communications cannot be performed.

Check item	Action
Is the instance ID specified correctly? ^{*1}	Check the manual for the external device that an instance ID receivable by the external device is set for the FX5-EIP (originator). Otherwise, change the instance ID to a receivable one and write the parameters again.
When the FX5-EIP is an originator, has the external device already performed multicast communication with other originators?	<ul style="list-style-type: none"> Match the settings of the FX5-EIP with those of other originators that are being communicated with.^{*2} Match the settings of other originators that are being communicated with the external device with those of the FX5-EIP.^{*2*3} Correct the system configuration so that the external device communicates only with the own node.

*1 This item applies to only EtherNet/IP devices for which an instance ID can be specified.

*2 Match all of the following connection settings: RPI, connection type, data size, trigger type, instance ID (or tag name), and priority.

*3 When the application type of other external devices is Exclusive Owner, set the application type of the FX5-EIP to Input Only.

■Class3 instance communications failed

The following table lists the actions to be taken if Class3 instance communications cannot be performed.

Check item	Action
When the FX5-EIP is a server, is the command requested by the EtherNet/IP device supported?	Check whether the EtherNet/IP device transmitted a command from the list of the message communication support commands. ( Page 254 Details of Message Communication Support Command)
Are the settings in "EtherNet/IP Configuration" correct?	Check the values set in "EtherNet/IP Configuration". When the following module function blocks are used, check the values set for the arguments. <ul style="list-style-type: none"> • Class3Originator_MessageSend
When the FX5-EIP is a client, is an area not available for Class3 used?	<ul style="list-style-type: none"> • Check that "0002H: Class3" is set as the initial value for the communication type specification area of the message communication area^{*1}. • Check that an area with a connection number for which Class3 communications parameters are set in "EtherNet/IP Configuration" is used.
Is the data in the response area of the message communication area correct?	When the FX5-EIP is a client, check the value for the result storage area of the message communication area ^{*1} . If the value is other than 0, check the error code and take an action. ( Page 214 Error codes for the message communication function (client))

*1 The buffer memory addresses in the message communication area differ depending on whether the module parameter "Maximum Number of Connections Setting" is set to "64 connections" or "128 connections". ( Page 251 Details of buffer memory addresses (data area G16944 to G109359 or G32560 to G109359))

■UCMM instance communications failed

The following table lists the actions to be taken if UCMM instance communications cannot be performed.

Check item	Action
Are the settings of the commands to request correct?	<ul style="list-style-type: none"> • Check the value set for the message communication area.^{*1} • When the module function block "UCMMOriginator_MessageSend" is used, check the value set for the argument.
When the FX5-EIP is a server, is the command requested by the EtherNet/IP device supported?	Check whether the EtherNet/IP device transmitted a command from the list of the message communication support commands. ( Page 251 Details of buffer memory addresses (data area G16944 to G109359 or G32560 to G109359))
When the FX5-EIP is a client, is a Class3-dedicated area used?	<ul style="list-style-type: none"> • Check that "0001H: UCMM communications" is set as the initial value for the communication type specification area of the message communication area^{*1}. • Check whether an area with a connection number for which Class3 communications parameters are set in "EtherNet/IP Configuration" is used.
Is the data in the response area of the message communication area correct?	When the FX5-EIP is a client, check the value for the result storage area of the message communication area ^{*1} . If the value is other than 0, check the error code and take an action. ( Page 214 Error codes for the message communication function (client))

*1 The buffer memory addresses in the message communication area differ depending on whether the module parameter "Maximum Number of Connections Setting" is set to "64 connections" or "128 connections". ( Page 251 Details of buffer memory addresses (data area G16944 to G109359 or G32560 to G109359))

EtherNet/IP devices cannot be detected

The following table lists the actions to be taken if the EtherNet/IP device detection function is used, but devices that should be present on the network cannot be detected.

Check item	Action
Have the EtherNet/IP devices to be detected started up?	<ul style="list-style-type: none"> Check that the EtherNet/IP devices to be detected have started up. When the EtherNet/IP device to be detected is the FX5-EIP, check that the RUN LED of the FX5-EIP is on.
Is communication enabled on the EtherNet/IP devices to be detected?	<ul style="list-style-type: none"> Check that the EtherNet/IP devices to be detected are linked up. If the EtherNet/IP device to be detected is the FX5-EIP, check that 'EtherNet/IP communication start status' (Un\G273) is set to "1: Operating". If the EtherNet/IP device to be detected is other than the FX5-EIP, check that EtherNet/IP communication is enabled using documentation such as the manuals of the external device.
Is the EtherNet/IP device to be detected within the range of broadcast frames?	<ul style="list-style-type: none"> Check if the EtherNet/IP device to be detected belongs to a network that is different from the FX5-EIP. Check that the setting is configured so that the broadcast frame reaches between the FX5-EIP and the EtherNet/IP device to be detected. Check that the broadcast frame is not blocked by the settings on the industrial switch or other devices.
Has the line load become high?	Check if the line load has increased. When the line load is high, the frame for detection may disappear, or the external device may not respond in some cases.
Has an error occurred in the CPU module or EtherNet/IP device?	<ul style="list-style-type: none"> Check if a moderate or major error has occurred in the FX5-EIP or the CPU module that controls the FX5-EIP. If an error occurs, eliminate the cause of the error. Check if an error has occurred on the EtherNet/IP device to be detected. If an error occurs, eliminate the cause of the error.
Does the EtherNet/IP device to be detected support the ListIdentity command?	When the EtherNet/IP device to be detected is other than the FX5-EIP, check that the EtherNet/IP device supports the ListIdentity command by referring to documentation such as manuals of the external device.
Has 'EtherNet/IP communication start status' (Un\G273) or the status of the CPU module changed during the execution of this function?	<ul style="list-style-type: none"> Check if 'EtherNet/IP communication start request' (Un\G272) was operated during the execution of the automatic detection of EtherNet/IP devices. If it was operated, perform the process again. Check if the status of the CPU module has changed from RUN to STOP during the execution of the automatic detection of EtherNet/IP devices. If it has changed, perform the process again.

Buffer memory data areas are not updated

■Data areas are not updated in Class1 tag communications

The following table lists the actions to be taken if Class1 tag communications are performed with an EtherNet/IP device, but the data areas are not updated.

Check item	Action
Is 'Block assurance state per connection' (Un\G233) set to "2: Data assured" when a value other than "0: Auto refresh is not set." is stored in 'Auto refresh processing' (Un\G228)?	<p>Take either or both of the following actions.</p> <ul style="list-style-type: none"> From the module parameter, access "Basic Settings" ⇒ "EtherNet/IP Setting" ⇒ "Refresh Settings", and set the auto refresh to "Disabled". Set 'EtherNet/IP communication start request' (Un\G272) to "0: Stop request" and 'Block assurance specification per connection' (Un\G232) to "0: Not assured". Then, change the setting again to "Other than 0: Start request".

■Data areas are not updated in Class1 instance communications

The following table lists the actions to be taken if Class1 instance communications are performed with an EtherNet/IP device, but the data areas are not updated.

Check item	Action
Is 'Block assurance state per connection' (Un\G233) set to "2: Data assured" when a value other than "0: Auto refresh is not set." is stored in 'Auto refresh processing' (Un\G228)?	<p>Take either or both of the following actions.</p> <ul style="list-style-type: none"> From the module parameter, access "Basic Settings" ⇒ "EtherNet/IP Setting" ⇒ "Refresh Settings", and set the auto refresh to "Disabled". Set 'EtherNet/IP communication start request' (Un\G272) to "0: Stop request" and 'Block assurance specification per connection' (Un\G232) to "0: Not assured". Then, change the setting again to "Other than 0: Start request".

9.6 List of Error Codes

This section lists the error codes, error details and causes, and actions for the errors that occur in the processing for data communications between the FX5-EIP and external devices or that are caused by processing requests from the CPU module on the own station.

The FX5-EIP has the following error codes.

Type	Overview	Reference
Module error	The information is displayed in the "Module Diagnostics" window of the FX5-EIP.	 Page 192 Module error
Status of each connection error	<ul style="list-style-type: none"> The information is displayed in the "Ethernet Diagnostics" window of the FX5-EIP. The information is stored in 'Common area error code' (Un\G108 to Un\G139). 	 Page 196 Error codes in status of each connection
Error codes upon execution of a PING test	The information is stored in 'PING test response area' (Un\G244 to Un\G256).	 Page 198 Error codes upon execution of a PING test
Error codes upon SLMPSEND instruction completion with an error	The information is stored in the completion status, which is located in the control data of the SLMPSEND instruction setting data.	 Page 199 Error codes upon SLMPSEND instruction completion with an error
EtherNet/IP communication error	The information is stored in 'Cyclic communication connection error status' (Un\G1392 to Un\G1903)	 Page 200 Error codes when a connection error occurs
Error codes for the message communication function (client)	<ul style="list-style-type: none"> The information is stored in the result storage area of the message communication area (response area). The information is stored in the error code of communication error for each module function block. 	 Page 214 Error codes for the message communication function (client)
Error codes for the tag communication function (server)	The information is stored in the CIP response code of the message communication area (response area).	 Page 216 Error codes for the tag communication function (server)

Module error

Error codes for module errors are displayed in the [Error Information] tab in the "Module Diagnostics" window of the FX5-EIP.

Error code	Error name	Error details and causes	Action
0800H	Link-down	The system was linked down due to disconnection of the network cable connected to an external device.	<ul style="list-style-type: none"> Check the operation of the external device. Check if the connection cable is disconnected.
0904H	Socket communication transmission failure	Transmitting a message over socket communication failed.	<ul style="list-style-type: none"> Check the operation of the external device. Check if the connection cable is disconnected.
1080H	ROM write count error	The number of writes to ROM exceeded 100000. (Number of writes > 100000)	Replace the module.
1810H	IP address change fails	The IP address change has failed.	Execute the IP address change function again.
1900H	Hardware error	A memory check error has occurred.	<ul style="list-style-type: none"> Execute the IP address change function again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1901H to 1903H	Hardware error	A memory check error has occurred.	<ul style="list-style-type: none"> Execute the hardware test. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1904H	Hardware error	A memory check error has occurred.	<ul style="list-style-type: none"> Use "EtherNet/IP Configuration" to write the parameters to the module again. Execute the hardware test. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1905H to 1906H	Hardware error	A memory check error has occurred.	<ul style="list-style-type: none"> Execute the hardware test. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.

Error code	Error name	Error details and causes	Action
19E0H	EtherNet/IP communication receive data error	An error was detected in the data received during EtherNet/IP communications.	<ul style="list-style-type: none"> • Check whether the operating status of the external device is normal. • Check for errors in the line status. • The line may be busy; try again later. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1D80H	Error during execution of dedicated instruction	A dedicated instruction that cannot be executed has been specified.	Check that the dedicated instruction is executable. If it is not executable, correct it.
1D83H	Error during execution of dedicated instruction	The dedicated instruction request data from the CPU module was discarded because the data size was abnormal.	<ul style="list-style-type: none"> • Execute the write operation to the program again. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1D84H	Error during execution of dedicated instruction	The dedicated instruction request data from the CPU module cannot be normally input.	<ul style="list-style-type: none"> • Execute the write operation to the program again. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1D85H	Error during execution of dedicated instruction	A timeout error occurred in the dedicated instruction response data, and the data was discarded.	<ul style="list-style-type: none"> • Reset the CPU module, and execute it again. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1DC4H	IP address change fails	The IP address change has failed.	<ul style="list-style-type: none"> • Execute the IP address change function again. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
1F00H	MELSOFT communication error	A communication error occurred in the MELSOFT connection.	<ul style="list-style-type: none"> • Check the number of connections in the MELSOFT connection as a whole. • Check the number of UDP connections in the MELSOFT connection.
2160H	IP address duplication detection	Overlapping IP addresses were detected.	Correct the IP address.
2C80H	Parameter error	A parameter error was detected in the external device configuration.	<ul style="list-style-type: none"> • Check the external device configuration settings in the FX5-EIP module parameters. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
2C81H	Parameter error	A parameter error was detected in the external device configuration.	<ul style="list-style-type: none"> • Check the external device configuration settings in the FX5-EIP module parameters. • Set it so that the sum of the number of connections in External Device Configuration and the number of settings in the simple CPU communication settings is 32 or less. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
2C82H	Parameter error	A parameter error was detected in the external device configuration.	<ul style="list-style-type: none"> • Check the external device configuration settings in the FX5-EIP module parameters. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
2CF0H	CPU module error	An error in the CPU module was detected.	Check the details of the error of the CPU module with the module diagnostics of GX Works3, and take measures.
2DA0H to 2DA1H	Parameter error	A parameter error was detected in the external device configuration.	Check and correct the setting of the number of connected modules in the external device configuration in the FX5-EIP module parameters.
2DA2H	Parameter error	A parameter error was detected in the external device configuration.	Check and correct the setting of the communication method in the external device configuration in the FX5-EIP module parameters.

Error code	Error name	Error details and causes	Action
2DA3H	Parameter error	A parameter error was detected in the external device configuration.	Check and correct the setting of the protocol in the external device configuration in the FX5-EIP module parameters.
2DA4H	Parameter error	A parameter error was detected in the external device configuration.	Check and correct the setting of the model name in the external device configuration in the FX5-EIP module parameters.
2DA6H	Parameter error	A parameter error was detected in the external device configuration.	Check and correct the setting of the IP address in the external device configuration in the FX5-EIP module parameters.
2DA7H	Parameter error	A parameter error was detected in the external device configuration.	Check and correct the setting of the IP address (IPv6) in the external device configuration in the FX5-EIP module parameters.
2DA8H	Parameter error	A parameter error was detected in the external device configuration.	Check and correct the setting of the alive check in the external device configuration in the FX5-EIP module parameters.
2DA9H to 2DAAH	Parameter error	A parameter error was detected in the external device configuration.	Check the external device configuration settings in the FX5-EIP module parameters.
2DABH	Parameter error	A parameter error was detected in the external device configuration.	Check the own node port number setting in the external device configuration in the FX5-EIP module parameters.
3040H	Update error	F/W update file version error	For this update, a programmable controller applicable to the new version is required. Please contact your local Mitsubishi representative.
3041H	Update error	F/W update file integrity verification failure error	Replace the update file on the SD memory card with the correct file, and perform the update again.
3042H	Update error	F/W update file acquisition failure	Replace the update file on the SD memory card with the correct file, and perform the update again.
3056H	Socket communication buffer full	The socket communication buffer for receiving has no space.	Read the received data using the dedicated instruction.
306DH	Parameter error	The IP address format is outside the range.	Please contact your local Mitsubishi representative.
306EH	Parameter error	The IP address (Ipv4) is outside the range.	Please contact your local Mitsubishi representative.
306FH	Parameter error	The subnet mask is outside the range.	Please contact your local Mitsubishi representative.
3073H	Parameter error	The gateway address (Ipv4) is outside the range.	Please contact your local Mitsubishi representative.
3074H	Parameter error	The subnet mask is outside the range.	Please contact your local Mitsubishi representative.
3095H	Parameter error	The number of target IP address setting is outside the range.	Please contact your local Mitsubishi representative.
3096H	Parameter error	The start target IP address setting is outside the range.	Please contact your local Mitsubishi representative.
3097H	Parameter error	The complete target IP address setting is outside the range.	Please contact your local Mitsubishi representative.
3098H	Parameter error	The start target IP address setting is outside the range > the complete target IP address setting is outside the range.	Please contact your local Mitsubishi representative.
3099H	Parameter error	The number of excluded IP address setting is outside the range.	Please contact your local Mitsubishi representative.
309AH	Parameter error	The target IP address setting number is outside the range.	Please contact your local Mitsubishi representative.
309BH	Parameter error	The excluded IP address number is outside the range.	Please contact your local Mitsubishi representative.
309CH	Parameter error	The excluded IP address is outside the range.	Please contact your local Mitsubishi representative.
309DH to 309EH	Parameter error	Target module support error	Please contact your local Mitsubishi representative.
309FH	Parameter error	The gateway address (Ipv6) is outside the range.	Please contact your local Mitsubishi representative.
30B3H	Parameter error	The refresh settings are outside the range.	Check and correct the refresh settings of the FX5-EIP module parameters.
30B4H	Parameter error	The EtherNet/IP auto-start setting is outside the range.	Check and correct the EtherNet/IP auto-start setting in the FX5-EIP module parameters.
30B5H	Parameter error	The maximum number of connections setting is outside the range.	Check and correct the setting of the maximum number of connections in the FX5-EIP module parameters.
31E0H	Parameter not set	The parameters of this module are not set in the CPU module.	<ul style="list-style-type: none"> Set the parameters for the CPU module. Check the mounting position of the module.

Error code	Error name	Error details and causes	Action
31E1H	Parameter error	An error was detected in the parameters set in "EtherNet/IP Configuration".	<ul style="list-style-type: none"> • Check that there is no inconsistency between the setting of the maximum number of connections in the FX5-EIP module parameters and the setting in "EtherNet/IP Configuration". • Check the firmware version of the module and the "EtherNet/IP Configuration" version, and check that the "EtherNet/IP Configuration" version is supported by the module. If an unsupported version of "EtherNet/IP Configuration" is used, update the module firmware to the latest version. • Use "EtherNet/IP Configuration" to write the parameters to the module again. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
31E2H	EtherNet/IP communication parameter error	An error was detected in the parameters set in "EtherNet/IP Configuration".	<ul style="list-style-type: none"> • Use "EtherNet/IP Configuration" to write the parameters to the module again. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
3C13H	Hardware error	A hardware failure has been detected.	Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
3E05H	Memory error	An error was detected in the memory.	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
3E06H	EtherNet/IP communication memory error	A memory error was detected during EtherNet/IP communications.	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
3E30H to 3E42H	Hardware error	A hardware failure has been detected.	Please contact your local Mitsubishi representative.
3E60H to 3E63H	Hardware error	A hardware failure has been detected.	Please contact your local Mitsubishi representative.
3FA1H	Memory error	An error was detected in the memory.	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.

Error codes in status of each connection

The error codes are displayed in "Status of Each Connection" on the "Ethernet Diagnostics" window of the FX5-EIP. They are also stored in 'Common area error code' (Un\G108 to Un\G139).

Error code	Error name	Error details and causes	Action
0910H	Ethernet port error	Data cannot be transmitted to the external device.	<ul style="list-style-type: none"> • Check the operation of the external device. • Check the condition of the cables, industrial switches, and routers on the lines to the external devices. • The line may be busy with packets; try again later. • The receiving area of the external device may be full (the window size of TCP is small). Check whether the receiving processing is performed on the external device side or unnecessary data is not transmitted from the FX5-EIP. • Check that the subnet mask pattern and default router IP address are set correctly on the FX5-EIP and external device, or that the IP address class is correct.
0911H	Ethernet port error	Communication with the external device was interrupted.	<ul style="list-style-type: none"> • Check the operation of the external device. • Check the condition of the cables, industrial switches, and routers on the lines to the external devices.
0912H	Ethernet port error	System error or connection connecting error in OS (Malfunction due to noise or hardware trouble may have occurred.)	<ul style="list-style-type: none"> • Check the operation of the external device. • Check the condition of the cables, industrial switches, and routers on the lines to the external devices.
0913H	Ethernet port error	The external device cannot be connected Or, the external device is disconnected.	<ul style="list-style-type: none"> • Check the operation of the external device. • Check the condition of the cables, industrial switches, and routers on the lines to the external devices. • If this error occurs during communication, try again later.
C012H	Error during execution of dedicated instruction	<ul style="list-style-type: none"> • The port number already used in the open completion connection of TCP/IP is set. • The external device port number set in the external device information is duplicated. 	Check and correct the port number of the EtherNet/IP module and the external device.
C013H	Error during execution of dedicated instruction	The port number used in the open completion connection is set during the open processing of UDP/IP.	Check and correct the port number of the EtherNet/IP module.
C017H	Error during execution of dedicated instruction	The connection was not established by the open processing of the TCP connection.	<ul style="list-style-type: none"> • Check the operation of the external device. • Check the open processing of the external device. • Correct the open setting of the communication parameter. • Check the port number of the EtherNet/IP module, the IP address/port number of the external device, and the open method. • Check if the connection cable is disconnected.
C020H	Error during execution of dedicated instruction	The data length exceeds an allowable range.	<ul style="list-style-type: none"> • Correct the data length. • If the amount of data to be transmitted exceeds the prescribed amount, divide and transmit the data.
C023H	Error during execution of dedicated instruction	<ul style="list-style-type: none"> • The open processing of the corresponding connection has not been completed. • The corresponding connection is closed. 	Perform the open processing for the corresponding connection.
C027H ¹	Error during execution of dedicated instruction	Transmitting a message over socket communication failed.	<ul style="list-style-type: none"> • Check whether the external device and industrial switch are operating normally. • Since there may be congestion of packets on the line, transmit the data after a certain period of time. • Check if the connection cable is disconnected. • Check that there is no connection failure with the industrial switch. • Execute the communication status test, and if the test is completed with an error, take corrective action. • Execute the module communication test, and check that there is no failure in the module. • Check the IP address specified as the target.
C029H	Error during execution of dedicated instruction	Description of control data is not correct.	Correct the descriptions of the control data.
C035H	Ethernet communication error	The existence of the external device could not be checked within the response monitor timer value.	<ul style="list-style-type: none"> • Check the operation of the external device. • Check and change the set values for the alive check. • Check if the connection cable is disconnected.
C050H	Ethernet communication error	ASCII code data that cannot be converted to binary was received.	Check if the ASCII code data that cannot be converted into binary code data has been transmitted from the external device.

Error code	Error name	Error details and causes	Action
C051H	Ethernet communication error	The maximum number of bit devices for which data can be read/written all at once is outside the allowable range.	Correct the number of bit devices that can be read or written all at once, and transmit the data to the EtherNet/IP module again.
C052H	Ethernet communication error	The maximum number of word devices for which data can be read/written all at once is outside the allowable range.	Correct the number of word devices that can be read or written all at once, and transmit the data to the EtherNet/IP module again.
C053H	Ethernet communication error	The maximum number of bit devices for which data can be random read/written all at once is outside the allowable range.	Correct the number of bit devices that can be read or written all at random, and transmit the data to the EtherNet/IP module again.
C054H	Ethernet communication error	The maximum number of word devices for which data can be random read/written all at once is outside the allowable range.	Correct the number of word devices that can be read or written all at random, and transmit the data to the EtherNet/IP module again.
C058H	Ethernet communication error	The request data length after ASCII to binary conversion does not match the number of data in the character section (part of text).	After checking and correcting the content of the text or the request data length in the header, transmit the message to the EtherNet/IP module again.
C059H	Ethernet communication error	<ul style="list-style-type: none"> The specified command and subcommand are incorrect. There is a command or subcommand that cannot be used by the EtherNet/IP module. 	<ul style="list-style-type: none"> Review and correct the request contents. Transmit a command or subcommand that can be used by the EtherNet/IP module.
C05BH	Ethernet communication error	The EtherNet/IP module cannot read or write data from/to the specified device.	Review and correct the device to be read or written.
C05CH	Ethernet communication error	There is an error in the request content. (Example: Reading or writing by bit unit for the word device)	Correct the request content and transmit it to the EtherNet/IP module again. (Example: Subcommand correction)
C05EH	Ethernet communication error	The communication time between the EtherNet/IP module and programmable controller CPU exceeds the Ethernet monitor timer setting.	<ul style="list-style-type: none"> Increase the monitoring timer value. Check the connection between the CPU and EtherNet/IP module.
C05FH	Ethernet communication error	This request cannot be executed to the access destination specified by the SLMP message.	Correct the access destination.
C060H	Ethernet communication error	There is an error in the request content. (Example: Incorrect data specified for the bit device)	Correct the request content and transmit it to the EtherNet/IP module again. (Example: Data correction)
C061H	Ethernet communication error	The length of the request data does not match the number of data in the character section (part of text).	After checking and correcting the content of the text or the request data length in the header, transmit the message to the EtherNet/IP module again.
C06FH	Ethernet communication error	When the communication data code is set to "Binary", a request message of ASCII is received. (The error history of this error code is registered, but no error response is returned.)	<ul style="list-style-type: none"> Transmit a request message that is adapted to the setting of the communication data code. Change to the communication data code which is adapted to the request message.
C0D8H	Ethernet communication error	The number of specified blocks exceeds the range.	Correct the specified number of blocks.
C0DEH	Ethernet communication error	Receiving a message through socket communication failed.	<ul style="list-style-type: none"> Check the operation of the external device or industrial switch. Since there may be congestion of packets on the line, transmit the data after a certain period of time. Check if the connection cable is disconnected. Check that there is no connection failure with the industrial switch. Execute the communication status test, and if the test is completed with an error, take corrective action. Execute the module communication test, and check that there is no failure in the module.
C1A4H	Ethernet communication error	<ul style="list-style-type: none"> The Ethernet diagnostics were attempted by connecting directly to the Ethernet port of the FX5-EIP. A function not supported by the target device was executed. 	<ul style="list-style-type: none"> Check and correct the general data command, application type, group, and global specification. Execute the Ethernet diagnosis using the direct connection to the CPU module (built-in Ethernet port).
C1A6H	Ethernet communication error	The specification of the connection number is incorrect.	Specify a number from 1 to 32 for the connection number.
C1A7H	Ethernet communication error	The specified network number is incorrect.	Correct the specified network number.
C1A8H	Ethernet communication error	The specified station number is incorrect.	Correct the specified station number.

Error code	Error name	Error details and causes	Action
C1B0H	Ethernet communication error	The open processing of the specified connection has already been completed.	Perform the open processing after completing the close processing.
C1B1H	Ethernet communication error	The open processing of the specified connection has not been completed.	Perform the open processing.
C1B2H	Ethernet communication error	The specified connection is executing the OPEN/CLOSE instruction.	Execute after the OPEN/CLOSE instruction has been completed.
C1B3H	Ethernet communication error	The specified channel is being used by another transmission/receive instruction.	<ul style="list-style-type: none"> • Change the channel number. • Execute after the transmission/receive instruction is completed.
C1CCH	Error during execution of dedicated instruction	A response of the data length that exceeds the allowable range was received by SLMPSEND.	<ul style="list-style-type: none"> • Execute the instruction again after correcting the request data so that the response data length falls within the range. • If the error occurs again even after taking the above action, please contact your local Mitsubishi representative.
C1D3H	Error during execution of dedicated instruction	An instruction not conforming to the specifications of the communication method for the connection has been executed.	Check that the dedicated instruction can be executed by the specified communication method. Correct the program if the instruction cannot be executed. Check that there are no errors in the connection specification of the dedicated instruction.
C709H	—	A communication error occurred in the MELSOFT direct connection.	<ul style="list-style-type: none"> • Do not specify the direct connection when MELSOFT is not directly connected. • For direct connection, do not turn off or reset the CPU module or disconnect the cable during communication.

*1 For errors that occur in SLMPSEND, refer to  Page 199 Error codes upon SLMPSEND instruction completion with an error.

Error codes upon execution of a PING test

An error code of a PING error is stored in the error code area of 'PING test response area' (Un\G244 to Un\G256).

Error code	Error name	Error details and causes	Action
1920H	Error during execution of IP address change	IP address settings (Un\G50 to Un\G55) or other values are out of the setting ranges.	Correct the IP address settings (Un\G50 to Un\G55) or other values.
1921H	Error during execution of IP address change	Write request and clear request (Un\G56 and Un\G58) turned from off to on simultaneously.	Check if write request and clear request (Un\G56 and Un\G58) turned from off to on simultaneously.
C0DBH	Error during execution of dedicated instruction	<ul style="list-style-type: none"> • The IP Address setting in the PING test request area is incorrect. • A PING test is in progress. 	<ul style="list-style-type: none"> • Set the IP address within the range between 1.0.0.1 and 126.255.255.255 or between 128.0.0.0 and 223.255.255.254. • The IP Address of the own node cannot be set. Set the IP Address of the external device.

Error codes upon SLMPSEND instruction completion with an error

Error codes upon SLMPSEND instruction completion with an error are stored in the completion status, which is located in the control data of the SLMPSEND instruction setting data.

Error code	Error name	Error details and causes	Action
C027H ^{*1}	Error during execution of dedicated instruction	Transmitting a message over SLMP communication failed.	<ul style="list-style-type: none"> • Check whether the external device and industrial switch are operating normally. • Since there may be congestion of packets on the line, transmit the data after a certain period of time. • Check if the connection cable is disconnected. • Check that there is no connection failure with the switching hub. • Check the IP address specified as the target.
C1CCH	Error during execution of dedicated instruction	A response of the data length that exceeds the allowable range was received by SLMPSEND.	<ul style="list-style-type: none"> • Execute the instruction again after correcting the request data so that the response data length falls within the range. • If the error occurs again even after taking the above action, please contact your local Mitsubishi representative.
D24AH	Error during execution of dedicated instruction	The specified arrival time is incorrect.	Set the arrival monitoring time within range.
D24BH	Error during execution of dedicated instruction	The specified number of retransmissions is incorrect.	Correct the specified number of retransmissions.
D253H	Error during execution of dedicated instruction	The reception of a response to the request failed.	Correct the specified response waiting time.
D256H	Error during execution of dedicated instruction	The execution or error completion type setting of the dedicated instruction is incorrect.	<ul style="list-style-type: none"> • Execute the instruction again after correcting the execution or error completion type in the control data. • If the error occurs again even after taking the above action, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
D273H	Error during execution of dedicated instruction	The specified data length is incorrect.	Correct the specified data length.
D275H	Error during execution of dedicated instruction	Other dedicated instructions are in execution, and the executed instruction cannot be processed.	<ul style="list-style-type: none"> • Execute the instruction again after a while. • If the error occurs again even after taking the above action, please contact your local Mitsubishi representative.
D2D2H	Error during execution of dedicated instruction	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 action, please contact your local Mitsubishi representative.
D2D3H	Error during execution of dedicated instruction	Data was not transmitted correctly via UDP/IP.	<ul style="list-style-type: none"> • Check that the external device (including an industrial switch) has no error in the connection setting, operation (an error and being in a reset state, or others), and connection (error such as a connection cable being disconnected). • Since there may be congestion of packets on the line, transmit the data after a certain period of time. • Execute the PING test and communication status test, and if the test is completed with an error, take corrective action. • Correct the IP address of the target station of the dedicated instruction.

^{*1} For errors displayed per connection status, refer to  Page 196 Error codes in status of each connection.

Error codes when a connection error occurs

The EtherNet/IP communication error codes are stored in 'Cyclic communication connection error status' (Un\G1392 to Un\G1903).

The following table lists the error codes for EtherNet/IP communication connection errors.

Address ^{*1}	Connection destination		Storage method	
Un\G1392 to 1393	Input	Connection No.1	Target	<div> <div>8 bits</div> <div>8 bits</div> <div>16 bits</div> </div> <div> <div>(1) StatusIn</div> <div>(3) CIP Status^{*2}</div> <div>(4) CIP Extended^{*3}</div> </div>
Un\G1394 to 1395		Connection No.2		
⋮		⋮		
Un\G1518 to 1519		Connection No.64		
⋮		⋮		
Un\G1646 to 1647	Output	Connection No.128	Originator	<div> <div>8 bits</div> <div>8 bits</div> <div>16 bits</div> </div> <div> <div>(1) StatusIn</div> <div>(5) CIP Status^{*2}</div> <div>(6) CIP Extended^{*3}</div> </div>
Un\G1648 to 1649		Connection No.1		
Un\G1650 to 1651		Connection No.2		
⋮		⋮		
Un\G1774 to 1775		Connection No.64		
⋮		⋮	Originator	<div> <div>8 bits</div> <div>8 bits</div> <div>16 bits</div> </div> <div> <div>(2) StatusOut</div> <div>(3) CIP Status</div> <div>(4) CIP Extended</div> </div>
Un\G1902 to 1903		Connection No.128		

*1 An error code is stored in 32 bits.

*2 When (1) StatusIn is 41H or 51H, General Status Code received from the external device is stored.

*3 When (1) StatusIn is 41H or 51H, Extended Status Code received from the external device is stored.

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
40H (scanner)	10H	0000H	Connection disabled	The connection has been set to be disabled.	<ul style="list-style-type: none"> Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
	20H	0284H	Stop of Class1 communications	Class1 communications are stopped.	Check whether the operating status of the external device is normal. Check for errors in the line status. The line may be busy; try again later.
		0000H	Stop of Class1 communications	Class1 communications are stopped.	Check whether the buffer memory area 'EtherNet/IP communication start request' is set to "ON". Check that the buffer memory area 'Cyclic communication pause specification' is set to "Cyclic communication pause not requested".
41H (scanner) 51H (adapter)	01H	0100H	CIP Extended error	The scanner requested ForwardOpen with the same settings as the current communication connection.	<ul style="list-style-type: none"> Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)". Close the connection of the external device and try again. Try again after the connection of the external device has timed out.
		0103H	CIP Extended error	Of the requested parameters, the combination of the transport class (Class1/Class3 communication method) and transmission trigger (Cyclic/ Application Trigger/Change of State) is not supported.	<p>■ If the FX5-EIP module is operating as a scanner</p> Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	0106H	CIP Extended error	A mismatch in property rights has occurred.	<p>When an Exclusive Owner is used, the adapter can receive only one communication for "Instance ID" set in "Output (O->T)" at a time.</p> <p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> When "Exclusive Owner" is set in "Application Type" as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration", check whether the adapter device of the request destination already uses the value set for "Instance ID" in "Output (O->T)" for communication with a different scanner by referring to documentation such as the manuals of the external device. When communicating with multiple connections using an adapter device and exclusive owner, check whether the same instance ID is set for "Instance ID" in "Output (O->T)" for connections for which "Exclusive Owner" is set in "Application Type" as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration". Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)". <p>■ If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> Check that the IP address specified by the scanner as the communication destination is correct. Check whether "Instance ID" of the parameter requested by the scanner is correct. Check whether "Application Type" of the parameter requested by the scanner is correct. Use documentation such as the manuals of the external device to check if communications using "Exclusive Owner" are newly requested for "Instance ID" of "Output O->T" of the connection already being communicated with "Exclusive Owner". The FX5-EIP module does not use the configuration (initial parameters). Refer to documentation such as the manuals of the external device and correct the parameters so that the configuration is not set to the parameters requested by the scanner.
		0107H	CIP Extended error	The external device cannot find the connection to close.	<p>Check the following items, and then restart the EtherNet/IP communications.</p> <ul style="list-style-type: none"> Is the operating status of the external device normal? Is the line status normal?
		0112H	CIP Extended error	Of the requested parameters, the requested packet interval (RPI) has an unsupported value.	<p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Use documentation such as the manuals of the external device to check that "RPI" of "Output O->T" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" is a value that can be accepted by the adapter. Use documentation such as the manuals of the external device to check that "RPI" of "Input T->O" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" is a value that can be accepted by the adapter. <p>■ If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> Of the parameters requested by the scanner, set the RPI to the minimum value (2 milliseconds) or higher. Of the parameters requested by the scanner, set the RPI to the maximum value (60 seconds) or lower. For multicast communication, match the RPI of T->O newly requested by the scanner with the RPI of T->O used in the currently active connection.

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	0113H	CIP Extended error	The number of connections has reached the upper limit.	<p>■If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Use documentation such as the manuals of the external device to check whether the number of connections that can be connected to the external device has reached the upper limit. Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)". <p>■If the FX5-EIP module is operating as an adapter A new connection cannot be made because 'Number of consumed connections' (UnG110116) has reached the upper limit. Reduce the number of connections.</p>
		0114H	CIP Extended error	The consistency check has failed due to a mismatch in the vendor code (vendor ID number) or product code (product ID number).	Perform troubleshooting based on the consistency check. (🔍 Page 36 Consistency check)
		0115H	CIP Extended error	The consistency check has failed due to product type (device type) mismatch.	Perform troubleshooting based on the consistency check. (🔍 Page 36 Consistency check)
		0116H	CIP Extended error	The consistency check has failed due to major revision or minor revision mismatch.	Perform troubleshooting based on the consistency check. (🔍 Page 36 Consistency check)
		0119H	CIP Extended error	No connection other than Listen Only is open.	<ul style="list-style-type: none"> When Listen Only is used, a connection other than Listen Only must already be established on the adapter device. Correct the parameters. Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".
		011BH	CIP Extended error	Of the requested parameters, Inhibit Time is greater than the RPI.	<p>■If the FX5-EIP module is operating as a scanner Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p> <p>■If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> Set "Inhibit Time" of the parameter requested by the scanner to be smaller than "RPI of T -> O". Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".
		011CH	CIP Extended error	Of the requested parameters, the transport class (communication method such as Class1/Class3) is not supported.	<p>■If the FX5-EIP module is operating as a scanner Use documentation such as the manuals of the external device to check whether the adapter device of the request destination supports the transport class (Class1/Class3 communication method) registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration".</p> <p>■If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> Use documentation such as the manuals of the external device to check whether the transport class of the parameters requested by the scanner is "Class1 Communications" or "Class3 Communications". Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	011DH	CIP Extended error	Of the requested parameters, the transmission trigger (Cyclic/ Application Trigger/Change of State) is not supported.	<p>■ If the FX5-EIP module is operating as a scanner Use documentation such as the manuals of the external device to check whether the adapter device of the request destination supports "Trigger Type" registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration".</p> <p>■ If the FX5-EIP module is operating as an adapter An unsupported value has been set for "Transport Type/ Trigger" of ForwardOpen requested by the scanner. Correct the parameter to be requested by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p>
		011EH	CIP Extended error	Of the requested parameters, the Direction (client/server) is not supported.	<p>■ If the FX5-EIP module is operating as a scanner Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p> <p>■ If the FX5-EIP module is operating as an adapter An unsupported value has been set for "Transport Type/ Trigger" of ForwardOpen requested by the scanner. Correct the parameter to be requested by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p>
		011FH	CIP Extended error	Of the requested parameters, O->T Fixed/Variable flag is not supported.	<p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> When "Real Time Format" of "Output O->T" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" is "Zero length data", use documentation such as the manuals of the external device to check whether the adapter device of the request destination supports "Variable". When "Real Time Format" of "Output O->T" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" is "Modeless" or "32-bit Header", use documentation such as the manuals of the external device to check whether the adapter device of the request destination supports "Fixed". Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)". <p>■ If the FX5-EIP module is operating as an adapter If the FX5-EIP module operates as an adapter (server) during Class3 communications, only "Variable" can be accepted as "O -> T network connection parameter" of the parameters that are requested by the scanner. Check documentation such as the manuals of the external device to set the request to "Variable".</p>

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	0120H	CIP Extended error	The requested T->O Fixed/ Variable flag is not supported.	<p>■If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> When "Real Time Format" of "Input T->O" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" is "Zero Length Data", use documentation such as the manuals of the external device to check whether the adapter device of the request destination supports "Variable". When "Real Time Format" of "Input T->O" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" is "Modeless" or "32-bit Header", use documentation such as the manuals of the external device to check whether the adapter device of the request destination supports "Fixed". Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)". <p>■If the FX5-EIP module is operating as an adapter If the FX5-EIP module operates as an adapter (server) during Class3 communications, only "Variable" can be accepted as "T -> O network connection parameter" of the parameters that are requested by the scanner. Check documentation such as the manuals of the external device to set the request to "Variable".</p>
		0123H	CIP Extended error	Of the requested parameters, the O->T Connection Type (output mode such as Point to Point/Multicast) is not supported.	<p>■If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Use documentation such as the manuals of the external device to check that the "Output Mode" of "Output O->T" that was registered as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is a value that can be accepted by the adapter. Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)". <p>■If the FX5-EIP module is operating as an adapter Use documentation such as the manuals of the external device to check whether "Connection Type of O -> T" of the parameters requested by the scanner is set to "Point to Point".</p>
		0124H	CIP Extended error	Of the requested parameters, the T->O Connection Type (input mode such as Point to Point/Multicast) is not supported.	<p>■If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Use documentation such as the manuals of the external device to check that the "Input Mode" of "Input T->O" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" is a value that can be accepted by the adapter. Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)". <p>■If the FX5-EIP module is operating as an adapter Use documentation such as the manuals of the external device to check whether "Connection Type of T -> O" of the parameters requested by the scanner is set to "Point to Point" or "Multicast".</p>
		0125H	CIP Extended error	Of the requested parameters, Redundant Owner is not supported.	<p>■If the FX5-EIP module is operating as a scanner Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p> <p>■If the FX5-EIP module is operating as an adapter If the FX5-EIP module operates as an adapter (server) during Class3 communications, only "clear (=0)" is accepted for "Redundant Owner" as "T -> O network connection parameter" of the parameters that are requested by the scanner. Check documentation such as the manuals of the external device to set the request to "clear (=0)".</p>

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	0126H	CIP Extended error	The data size that was set in the configuration instance was an unacceptable value.	<p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Check the manual of the external device, and if the configuration (initial parameter) does not need to be set upon request, avoid setting the data. Check the manual of the external device, and if the configuration (initial parameter) needs to be set upon request, set the specified data. (This data is usually specified in the EDS. Therefore, check that the version of the EDS in use matches that of the adapter device.) <p>■ If the FX5-EIP module is operating as an adapter</p> <p>The FX5-EIP module does not use the configuration (initial parameters). Refer to documentation such as the manuals of the external device and correct the parameters so that the configuration is not set to the parameters requested by the scanner.</p>
		0127H	CIP Extended error	Of the requested parameters, the data size that was set in O->T was an unacceptable value.	<p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Check that the IP address of the module specified as the communication destination in "EtherNet/IP Configuration" matches the IP address of the desired module. Use documentation such as the manuals of the external device to check that the size that was set in "Data Size (byte)" of "Output O->T" as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is a value that can be accepted by the adapter. <p>■ If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> Check that the IP address specified by the scanner as the communication destination is correct. Check whether "Instance ID (O->T)/Tag Name" of the connection registered in the connection settings (adapter) in "EtherNet/IP Configuration" is set correctly for "instance ID and tag name of O->T" of the parameter that is requested by the scanner. When "Application Type" of the parameter to be requested by the scanner is "Exclusive Owner", check that "data size of O->T" of the parameters to be requested matches "Data Size (O->T)" of the connection that was registered in the connection settings (adapter) in "EtherNet/IP Configuration". When "Application Type" of the parameter to be requested by the scanner is "Input Only", only 0 can be accepted for "data size of O->T" of the parameter to be requested. Correct the parameter to be requested by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".
		0128H	CIP Extended error	Of the requested parameters, the data size that was set in T->O was an unacceptable value.	<p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Check that the IP address of the module specified as the communication destination in "EtherNet/IP Configuration" matches the IP address of the desired module. Use documentation such as the manuals of the external device to check that the size that was set in "Data Size (byte)" of "Input T->O" as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is a value that can be accepted by the adapter. <p>■ If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> Check that the IP address specified by the scanner as the communication destination is correct. Check whether "Instance ID/Tag Name" of the connection registered in the connection settings (adapter) in the "EtherNet/IP Configuration" is set correctly for "Instance ID/Tag Name" of the parameter that is requested by the scanner. Check that "data size of T->O" of the parameters requested by the scanner matches "Data Size" of the connection that was registered in the connection settings (adapter) in "EtherNet/IP Configuration".

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	0129H	CIP Extended error	The configuration instance does not exist (incorrect configuration instance ID was specified).	<p>■ If the FX5-EIP module is operating as a scanner Use documentation such as the manuals of the external device to check that the instance ID value that was set in "Configuration Instance" as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is correct.</p> <p>■ If the FX5-EIP module is operating as an adapter The FX5-EIP module does not use the configuration (initial parameters). Refer to documentation such as the manuals of the external device and correct the parameters so that the configuration is not set to the parameters requested by the scanner.</p>
		012AH	CIP Extended error	An invalid Consumer application path (instance ID of O->T) or tag name was requested.	<p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> • Check that the IP address of the module specified as the communication destination in "EtherNet/IP Configuration" matches the IP address of the desired module. • Use documentation such as the manuals of the external device to check that the value set for "Instance ID" of "Output O->T" as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is correct. • Use documentation such as the manuals of the external device to check that the value set for "Tag Name" as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is correct. • Use documentation such as the manuals of the external device to check whether the connection of the external device is in a state where communication is not possible due to a reserved node status or a Class1 communication stop status. <p>■ If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> • Check that the IP address specified by the scanner as the communication destination is correct. • Check whether "instance ID and tag name of O->T" of the parameter requested by the scanner is registered in the connection settings (adapter) in "EtherNet/IP Configuration". • Check whether "Tag Name" of the connection registered in the connection settings (adapter) in "EtherNet/IP Configuration" is set correctly for "Tag Name" of the parameter that was requested by the scanner. • When "Application Type" of the parameter requested by the scanner is "Exclusive Owner", check that "instance ID of O->T" of the parameters to be requested matches "Instance ID (O->T)" of the connection that was registered in the connection settings (adapter) in "EtherNet/IP Configuration". • When "Application Type" of the parameter requested by the scanner is "Input Only", check documentation such as the manuals of the external device, and correct the parameters so that "Real Time Format" of "Output O->T" is set to "Heartbeat" and "Instance ID" is set to "198 (0xC6)".

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	012BH	CIP Extended error	An invalid Producer application path (instance ID of T->O) has been requested.	<p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> Check that the IP address of the module specified as the communication destination in "EtherNet/IP Configuration" matches the IP address of the desired module. Use documentation such as the manuals of the external device to check that the value set for "Instance ID" of "Input T->O" as a parameter in the connection settings (scanner) in "EtherNet/IP Configuration" is correct. Use documentation such as the manuals of the external device to check that the value set for "Tag Name" as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is correct. Use documentation such as the manuals of the external device to check whether the connection of the external device is in a state where communication is not possible due to a reserved node status or a Class1 communication stop status. <p>■ If the FX5-EIP module is operating as an adapter</p> <ul style="list-style-type: none"> Check that the IP address specified by the scanner as the communication destination is correct. Check whether "Instance ID" of the parameter requested by the scanner is registered in the connection settings (adapter) in "EtherNet/IP Configuration". Check whether "Instance ID" of the connection registered in the connection settings (adapter) in "EtherNet/IP Configuration" is set correctly for "Instance ID" of the parameter that is requested by the scanner.
		0132H	CIP Extended error	The NULL FORWARD OPEN function is not supported.	The FX5-EIP module does not support the NULL FORWARD OPEN function. Correct the parameter by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)" so that the scanner does not use the NULL FORWARD OPEN function.
		0135H	CIP Extended error	Of the requested parameters, the Fixed/Variable flag did not match the value that was set in the connection of the ongoing multicast communication.	<p>When a new participant joins the ongoing multicast communication, the Fixed/Variable flag must match the existing communication.</p> <p>■ If the FX5-EIP module is operating as a scanner</p> <ul style="list-style-type: none"> When "Real Time Format" of "Input T->O" that was registered as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is "Zero Length Data", use documentation such as the manuals of the external device to check that multicast during communications is "Variable". When "Real Time Format" of "Input T->O" that was registered as a parameter of the connection settings (scanner) in "EtherNet/IP Configuration" is "Modeless" or "32-bit Header", use documentation such as the manuals of the external device to check that multicast during communications is "Fixed". <p>■ If the FX5-EIP module is operating as an adapter</p> <p>Use documentation such as the manuals of the external device to check that "O -> T network connection parameter" of the parameters requested by the scanner is "Fixed".</p>
		0136H	CIP Extended error	Of the requested parameters, the Priority did not match the value that was set in the connection of the ongoing multicast communication.	<p>When a new participant joins the ongoing multicast communication, the Priority must match the existing communication.</p> <p>■ If the FX5-EIP module is operating as a scanner</p> <p>Use documentation such as the manuals of the external device to check that "Priority" of "Input T->O" that was registered as a parameter in the connection settings (scanner) in "EtherNet/IP Configuration" matches the Priority that was set in the connection of ongoing multicast communications.</p> <p>■ If the FX5-EIP module is operating as an adapter</p> <p>Use documentation such as the manuals of the external device to check that the Priority that was requested by the external device matches the Priority that was set in the connection of the ongoing multicast communication.</p>

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	0137H	CIP Extended error	Of the requested parameters, the transport class (Class0/1) did not match the value that was set in the connection of the ongoing multicast communication.	When a new participant joins the ongoing multicast communication, the transport class (Class0/1) must match the existing communication. ■If the FX5-EIP module is operating as a scanner The FX5-EIP module can be used only for Class1 communications. Change the transport class that was set in the connection of the ongoing multicast communication to Class1. ■If the FX5-EIP module is operating as an adapter The FX5-EIP module can be used only for Class1 communications. Refer to the manuals of the external device, and change the transport class to Class1.
		0138H	CIP Extended error	Of the requested parameters, the transmission trigger (Cyclic/Application Trigger/Change of State) did not match the value that was set in the connection of the ongoing multicast communication.	When a new participant joins the ongoing multicast communication, the transmission trigger (Cyclic/Application Trigger/Change of State) must match the existing communication. ■If the FX5-EIP module is operating as a scanner Use documentation such as the manuals of the external device to check that the transmission trigger set in "Trigger Type" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" matches the transmission trigger that was set in the connection of the ongoing multicast communication. ■If the FX5-EIP module is operating as an adapter Use documentation such as the manuals of the external device to check that the transmission trigger that was requested by the external device matches the transmission trigger that was set in the connection of the ongoing multicast communication.
		0139H	CIP Extended error	Of the requested parameters, the Inhibit Time did not match the value that was set in the connection of the ongoing multicast communication.	When a new participant joins the ongoing multicast communication, the Inhibit Time must match that of the existing communication. ■If the FX5-EIP module is operating as a scanner Use documentation such as the manuals of the external device to check that the inhibit time set in "Inhibit Time" that was registered as a parameter for the connection settings (scanner) in "EtherNet/IP Configuration" matches the inhibit time that was set in the connection of the ongoing multicast communication. ■If the FX5-EIP module is operating as an adapter Check that the Inhibit time requested by the external device matches the Inhibit time set for the connection for the multicast communication already being performed by referring to documentation such as the manuals of the external device.
		0203H	CIP Extended error	Connection timeout	<ul style="list-style-type: none"> • Check whether the operating status of the external device is normal. • Check for errors in the line status. • The line may be busy; try again later. • Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
41H (scanner) 51H (adapter)	01H	0315H	CIP Extended error	The requested connection path ("Connection Path" that was set to ForwardOpen) was not acceptable.	<p>■ If the FX5-EIP module is operating as a scanner Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p> <p>■ If the FX5-EIP module is operating as an adapter The connection path requested by the scanner could not be received for the following reasons. Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p> <ul style="list-style-type: none"> • The format of the requested connection path is incorrect. • During Class1 communications, the class ID or instance ID of the connection path was not set. • During Class1 communications, a value other than the Assembly object (class ID: 4) was set as the class ID of the connection path. • During Class3 communications, a value other than the Message Router object (class ID: 2) was set as the class ID of the connection path. • During Class3 communications, a value other than 1 was set as the instance ID of the connection path. • During Class3 communications, a value other than 1 was set as the configuration instance ID of the connection path.
		031DH	CIP Extended error	An error notification has been received from the external device.	Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".
	02H 04H 09H 0CH 10H 13H 15H	—	CIP Extended error	An error notification has been received from the external device.	Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".
Except for shown above	—	—	CIP Extended error	An error notification has been received from the external device.	<p>Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".</p> <ul style="list-style-type: none"> • Stored value in (3) or (5) above: Value of General Status notified by the external device • Stored value in (4) or (6) above: Value of Extended Status notified by the external device

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
43H (scanner)	00H	0002H	Connection start error	Network path error	<ul style="list-style-type: none"> Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		02BCH	Connection start error	Memory error	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
		012EH	Connection start error	Specified connection instance ID duplication	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
		012FH	Connection start error	Invalid target IP address	<ul style="list-style-type: none"> Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		0130H	Connection start error	No TCP/IP interface object for the specified IP address	<ul style="list-style-type: none"> Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		01C3H	Connection start error	"EtherNet/IP Configuration" parameter error	<ul style="list-style-type: none"> Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
44H (scanner)	00H	0002H	Connection error	The target device does not exist.	<ul style="list-style-type: none"> Check whether the operating status of the external device is normal. Check for errors in the line status. The line may be busy; try again later. The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.
		01H	Connection error	The target device does not exist.	<ul style="list-style-type: none"> Check whether the operating status of the external device is normal. Check for errors in the line status. The line may be busy; try again later. The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.
	00H	0003H	Connection error	A timeout occurred in the connection with the external device.	<ul style="list-style-type: none"> Check whether the operating status of the external device is normal. Check for errors in the line status. The line may be busy; try again later. The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.
		0005H	Connection error	A timeout occurred in the connection with the external device.	<ul style="list-style-type: none"> Check that the Ethernet cable is not disconnected. Check whether the operating status of the external device is normal. Check for errors in the line status. The line may be busy; try again later. The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
44H (scanner)	02H	0005H	Connection error	A timeout occurred in the connection with the external device.	<ul style="list-style-type: none"> • Check whether the operating status of the external device is normal. • Check for errors in the line status. • The line may be busy; try again later. • The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.
	00H	0280H	Connection error	Forward Close has been received from the external device.	<ul style="list-style-type: none"> • Check whether the operating status of the external device is normal. • Check for errors in the line status. • The line may be busy; try again later. • The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.
		0281H	Connection error	Connection stop failed.	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
	01H	0281H	Connection error	Connection stop failed.	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
	10H	02BCH	Connection error	Memory error	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
	20H	02BCH	Connection error	Memory error	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
45H (scanner) 55H (adapter)	11H	0256H	Socket error	Socket generation has failed.	<ul style="list-style-type: none"> • Retry the operation after a while. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		00CCH	Socket error	The socket option setting (non-blocking) failed.	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
		0264H	Socket error	Socket option setting error	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
		0266H	Socket error	Socket option setting error	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
		0267H	Socket error	Socket option setting error	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
45H (scanner) 55H (adapter)	11H	0257H	Socket error	Socket registration error	<ul style="list-style-type: none"> • Retry the operation after a while. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		0262H	Socket error	Socket option setting error	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
		0263H	Socket error	Socket option setting error	<ul style="list-style-type: none"> • Take measures to reduce noise. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
		Socket error code	Socket error	IO data transmission error. The error code obtained from the communication stack was set.	<ul style="list-style-type: none"> • Retry the operation after a while. • Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
46H (scanner)	00H	00CFH	Maximum number of connections	A connection cannot be created because the maximum number of connections has been reached.	<ul style="list-style-type: none"> • Check for errors in the line status. • The line may be busy; try again later. • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.
	10H	00D0H	Maximum number of requests	A request cannot be created because the maximum number of requests has been reached.	<ul style="list-style-type: none"> • Check for errors in the line status. • The line may be busy; try again later. • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.
	20H	00D0H	Maximum number of requests	A request cannot be created because the maximum number of requests has been reached.	<ul style="list-style-type: none"> • Check for errors in the line status. • The line may be busy; try again later. • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.
50H (adapter)	10H	0000H	Connection disabled	The connection has been set to be disabled.	<ul style="list-style-type: none"> • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. • If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
	20H	0000H	Stop of Class1 communications	Class1 communications are stopped.	Check whether the buffer memory area 'EtherNet/IP communication start request' is set to "ON". Check that the buffer memory area 'Cyclic communication pause specification' is set to "Cyclic communication pause not requested".
		0284H	Connection stop	The connection has stopped.	<ul style="list-style-type: none"> • Check whether the operating status of the external device is normal. • Check for errors in the line status. • The line may be busy; try again later.

Error code			Error name	Error details and causes	Action
(1) or (2)	(3) or (5)	(4) or (6)			
53H (adapter)	00H	0136H	Instance registration error	Assembly instance size error	<ul style="list-style-type: none"> Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		0133H	Instance registration error	Registration failed because the maximum number of assembly objects has been reached.	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		0131H	Instance registration error	Invalid assembly instance	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		0132H	Instance registration error	Assembly instance duplication	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		0135H	Instance registration error	The assembly buffer is full.	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
		0134H	Instance registration error	Assembly instance offset error	<ul style="list-style-type: none"> Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module on which the error occurred. Please contact your local Mitsubishi representative.
54H (adapter)	00H	0005H	Connection error	A timeout occurred in the connection with the external device.	<ul style="list-style-type: none"> Check that the Ethernet cable is not disconnected. Check whether the operating status of the external device is normal. Check for errors in the line status. The line may be busy; try again later. The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.
		0280H	Connection error	Forward Close has been received from the external device.	<ul style="list-style-type: none"> Check whether the operating status of the external device is normal. Check for errors in the line status. The line may be busy; try again later. The external device may not be able to transmit data at the specified RPI due to a high communication load, so specify a larger RPI and connect again.
	20H	02BCH	Connection error	Memory error	<ul style="list-style-type: none"> Take measures to reduce noise. Reset the CPU module and run it again. If the error occurs again even after the above action is taken, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative.
56H (adapter)	00H	00CFH	Connection start error	A connection cannot be created because the maximum number of connections has been reached.	<ul style="list-style-type: none"> Check for errors in the line status. The line may be busy; try again later. Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.

Error codes for the message communication function (client)

Error codes for the message communication function (client) are stored in the following.

- Result storage area of the message communication area (response area)
- o_uStatusId of each module function block (communication error code)

Error code	Error details and causes	Action
0001H	A value outside the range was set for the request area or the input argument of the module function block.	<ul style="list-style-type: none"> • Check the value set for the request area.*1 • Check the value set for the argument of the module function block.*2
0002H	The size of the received data exceeded the maximum number of bytes per connection.	<ul style="list-style-type: none"> • Check the settings of the external device. • Check that there is no noise on the line. • Check the maximum number of connections setting.
0003H	The connection set for the message communication reserved node was used.	Check the Class3 communication parameters and change the connection destination from the reserved node.
0004H	Class3 communications were performed using a request area where Class3 communications parameters were not set.	<ul style="list-style-type: none"> • Check that the area used is correct. • Set Class3 communications parameters in the area used.
0005H	Class3 communications or UCMM communications were performed using a request area that differs from the parameter set in "EtherNet/IP Configuration".	<ul style="list-style-type: none"> • Check whether the setting value of the buffer memory area for specifying the communication type of the target connection number in the request area matches the parameter of the target connection set in "EtherNet/IP Configuration". • When Class3 communications are used, set the Class3 communication parameters for the target connection in "EtherNet/IP Configuration". • When UCMM communications are used, no parameters are set for the target connection in "EtherNet/IP Configuration".
0006H	Class3 communications failed.	<ul style="list-style-type: none"> • Check that the Ethernet cable is not disconnected. • Check that the cable is not disconnected or reconnected during Class3 communications. • Use PING or a similar method to check that a node with the request destination IP address exists on the network. • Check whether the external device is operating normally.
0010H	Access to the buffer memory area is prohibited by the "Assurance of input/output data" function.	<ul style="list-style-type: none"> • Check whether the "Assurance of input/output data" function is enabled or disabled. • Check "Input data update status" and "Output data update status".
0101H	A request for message communications failed to be transmitted.	<ul style="list-style-type: none"> • Check that the Ethernet cable is not disconnected. • Use PING or a similar method to check that a node with the request destination IP address exists on the network. • When Class3 communications are requested, check that the external device supports Class3 communications. • When UCMM communications are requested, check that the external device supports UCMM communications. • Check that there is no noise on the line. • Check whether the external device is operating normally.
0102H	There was no response to the request for message communications.	<ul style="list-style-type: none"> • Check that the Ethernet cable is not disconnected. • Use PING or a similar method to check that a node with the request destination IP address exists on the network. • Check whether 'EtherNet/IP communication start request' (UnIG273) of the buffer memory area is set to "On". • When Class3 communications are requested, check that the external device supports the Class3 communication server function. • When UCMM communications are requested, check that the external device supports the UCMM communication server function. • Refer to the manual for the external device and check that the external device is ready to receive a request. • Check that the cable is not disconnected or reconnected during Class3 communications. • Check that there is no noise on the line.
0103H	Connection establishment for Class3 communications failed.	<ul style="list-style-type: none"> • Check that the Ethernet cable is not disconnected. • Check that the request destination IP address set in the Class3 communications parameters is correct. • Check that the external device supports the Class3 communication server function. • Check that the cable is not disconnected or reconnected during Class3 communications. • Check that there is no noise on the line. • Check whether the external device is operating normally.
0104H	There was no response to ForwardOpen for performing Class3 communications.	<ul style="list-style-type: none"> • Check that the external device supports the Class3 communication server function. • Refer to the manual for the external device and check that the external device is ready to receive a request. • Check that there is no noise on the line.

Error code	Error details and causes	Action
0165H	The number of simultaneous executions for UCMM communications has reached its upper limit.	<ul style="list-style-type: none"> • Reduce the number of UCMM communication connections being executed simultaneously. • Retry the operation after a while.
01FFH	An error was set in the CIP response code.	Check the conditions for notifying this error and the action to take by referring to documentation such as the manuals of the external device and the EtherNet/IP specifications "THE CIP NETWORKS LIBRARY Volume 1 Common Industrial Protocol (CIP™)".
F000H to F1F0H	The data size specified in UCMM communications exceeds the allowable setting range.	<p>Take the following action according to the value set in FxxxH (xxx = 000 to 1F0).</p> <ul style="list-style-type: none"> • xxx=000 The data size cannot be set to "0" for UCMM tag communications. Check the value set for the data size. • Other than xxx = 000 A value that has been set exceeds the allowable data size value for UCMM instance communications/UCMM tag communications. The maximum value that can be set for the data size is xxx. Check the value set for data size. <p>For allowable data size settings for UCMM communications, refer to the following.  Page 240 I/O data size</p>

*1 For values that can be set in request areas, refer to  Page 248 Message communication request/response area.

*2 For values that can be set for arguments in module function blocks, refer to the following.

 MELSEC iQ-F FX5 Ethernet, EtherNet/IP, CC-Link IE Function Block Reference

Error codes for the tag communication function (server)

The error codes for the tag communication function (server) are CIP response codes returned to the FX5-EIP for read/write requests from the external device.

For the error code check method, refer to the manual for the external device.

General Status	Extended Status	CIP Status Name	Error details and causes	Action
00H	0000H	Success	Normal completion	—
05H	0000H	Path destination unknown	The target tag name does not exist.* ¹	Check the tag name specified by the external device (originator).
08H	0000H	Service not supported	There was a request for an unsupported service.	If the external device (originator) is an FX5-EIP, set the Path Segment specification to "0".* ² Check that the unconnected send service is not in use. Check that the service code of the request transmitted from the external device (originator) is correct.
13H	0000H	Not enough data	Not all the parameters are set for Read/Write Tag Service.	Check that the request transmitted from the external device (originator) is correct.* ³ Check that there is no noise on the line.
15H	0000H	Too much data	The request data size specified by Read/Write Tag Service exceeded the data size set to the tag.	Increase the data size set in the tag for Class3/UCMM tag communications of the FX5-EIP. Reduce the request data size specified by the external device (originator). Check that the request transmitted from the external device (originator) is correct.* ³
1FH	0002H	Vendor specific error	There is a type mismatch between Tag Type specified by Read/Write Tag Service and Tag Type set in the specified tag.	Match Tag Type set in the tag for Class3/UCMM tag communications of the FX5-EIP to Tag Type specified by the external device (originator).

*¹ Requests for a tag set as a tag for Class1 tag communications cannot be accepted. If such a tag is specified, this error code is returned.

*² For the setting method to specify Path Segment of the FX5-EIP, refer to  Page 248 Message communication request/response area.

*³ Check that the minimum service parameters required for using Read/Write Tag Service exist. When using Write Tag Service, check the size of the actual data to be actually written for the specified request size.

9.7 List of Event Code

The following table lists events that occur in the FX5-EIP.

Event code	Event type	Event category	Event status	Detected event	Detailed information		
					Detailed information 1	Detailed information 2	Detailed information 3
0800	System	Error	Minor	Link-down	Operation source information	Communication speed and communication mode	—
0904	System	Error	Minor	Socket communication transmission failure	Operation source information	—	—
1080	System	Error	Major	ROM write count error	Number of times information ^{*1}	—	—
1810	System	Error	Minor	IP address change fails	—	—	—
1900	System	Error	Minor	Flash memory check error (IP address change function sector)	—	—	—
1901	System	Error	Minor	Flash memory check error (Total number sector of writes to memory Flash ROM)	—	—	—
1902	System	Error	Minor	Flash memory check error (Flash memory test sector)	—	—	—
1903	System	Error	Minor	Flash memory check error (TCP Inactivity Timeout sector)	—	—	—
1904	System	Error	Minor	Flash memory check error (EIP parameter sector)	—	—	—
1905	System	Error	Minor	Memory check error	—	—	—
1906	System	Error	Minor	Hardware error	—	—	—
19E0	System	Error	Minor	EtherNet/IP communication receive data error	—	—	Failure information
1F00	System	Error	Minor	MELSOFT connection error	—	—	—
2160	System	Error	Moderate	IP address duplication detection	—	—	Failure information
2C80	System	Error	Moderate	Receive parameter sum value error	—	—	Failure information
2C81	System	Error	Moderate	Receive parameter data error	—	—	Failure information
2C82	System	Error	Moderate	Divided parameter receive error	—	—	Failure information
2CF0	System	Error	Moderate	FX5-EIP WDT error occurrence	—	—	Failure information
2DA0	System	Error	Moderate	Connection setting parameter (Error in the number of connection setting)	Parameter information ^{*2}	—	—
2DA1	System	Error	Moderate	Connection setting parameter (Connection number error)	Parameter information ^{*2}	—	—
2DA2	System	Error	Moderate	Connection setting parameter (Communication destination communication method error)	Parameter information ^{*2}	—	—
2DA3	System	Error	Moderate	Connection setting parameter (Protocol system error)	Parameter information ^{*2}	—	—
2DA4	System	Error	Moderate	Connection setting parameter (Open system error)	Parameter information ^{*2}	—	—
2DA6	System	Error	Moderate	Connection setting parameter (IP address (IPv4) error)	Parameter information ^{*2}	—	—
2DA7	System	Error	Moderate	Connection setting parameter (IP address (IPv6) error)	Parameter information ^{*2}	—	—
2DA8	System	Error	Moderate	Connection setting parameter (Existence confirmation specification error)	Parameter information ^{*2}	—	—
2DA9	System	Error	Moderate	Connection setting parameter (Communication data code error)	Parameter information ^{*2}	—	—

Event code	Event type	Event category	Event status	Detected event	Detailed information		
					Detailed information 1	Detailed information 2	Detailed information 3
2DAA	System	Error	Moderate	Connection setting parameter (Error in specification of writing during running)	Parameter information ^{*2}	—	—
2DAB	System	Error	Moderate	Connection setting parameter own node port number error	Parameter information ^{*2}	—	—
3040	System	Error	Moderate	Firmware update file version error	—	—	—
3041	System	Error	Moderate	Failure in verification of firmware update file integrity	—	—	—
3042	System	Error	Moderate	Failure in acquisition of firmware update file	—	—	—
3056	System	Error	Moderate	Socket communication buffer full	—	—	Failure information
306D	System	Error	Moderate	IP address format out of range	Parameter information ^{*2}	—	—
306E	System	Error	Moderate	IP address (Ipv4) out of range	Parameter information ^{*2}	—	—
306F	System	Error	Moderate	Subnet mask out of range	Parameter information ^{*2}	—	—
3073	System	Error	Moderate	Gateway address (IPv4) out of range	Parameter information ^{*2}	—	—
3074	System	Error	Moderate	Subnet mask out of range	Parameter information ^{*2}	—	—
3095	System	Error	Moderate	Number of target IP address setting out of range (IP filter settings)	Parameter information ^{*2}	—	—
3096	System	Error	Moderate	IP address 1 out of range (IP filter settings)	Parameter information ^{*2}	—	—
3097	System	Error	Moderate	IP address 2 out of range (IP filter settings)	Parameter information ^{*2}	—	—
3098	System	Error	Moderate	IP address 1 ≥ IP address 2 error (IP filter settings)	Parameter information ^{*2}	—	—
3099	System	Error	Moderate	Number of excluded IP address setting out of range (IP filter settings)	Parameter information ^{*2}	—	—
309A	System	Error	Moderate	Target IP address setting number out of range (IP filter settings)	Parameter information ^{*2}	—	—
309B	System	Error	Moderate	Excluded IP address number out of range (IP filter settings)	Parameter information ^{*2}	—	—
309C	System	Error	Moderate	Excluded IP address out of range (IP filter settings)	Parameter information ^{*2}	—	—
309D	System	Error	Moderate	Target module support error (IP address settings parameter)	Parameter information ^{*2}	—	—
309E	System	Error	Moderate	Target module support error (Gateway address setting parameter)	Parameter information ^{*2}	—	—
30B3	System	Error	Moderate	Refresh settings out of range	Parameter information ^{*2}	—	—
30B4	System	Error	Moderate	EtherNet/IP auto-start setting out of range	Parameter information ^{*2}	—	—
30B5	System	Error	Moderate	Maximum number of connections setting out of range	Parameter information ^{*2}	—	—
31E0	System	Error	Moderate	Parameter not set	System configuration information	—	—
31E1	System	Error	Moderate	Parameter error	—	—	Failure information
31E2	System	Error	Moderate	EtherNet/IP communication parameter error	—	—	Failure information
3C13	System	Error	Major	Hardware error	—	—	Failure information
3E05	System	Error	Major	Memory error	—	—	Failure information

Event code	Event type	Event category	Event status	Detected event	Detailed information		
					Detailed information 1	Detailed information 2	Detailed information 3
3E06	System	Error	Major	EtherNet/IP communication memory error	—	—	Failure information
3E30	System	Error	Major	Fixed memory block acquisition/release ID number invalid	—	—	Failure information
3E31	System	Error	Major	Fixed memory block acquisition/release context error	—	—	Failure information
3E32	System	Error	Major	Error in forced cancellation of waiting for fixed memory block acquisition/release	—	—	Failure information
3E33	System	Error	Major	Error in forced cancellation of waiting due to the reset of a fixed memory block acquisition/release object	—	—	Failure information
3E34	System	Error	Major	Fixed memory block acquisition/release parameter error	—	—	Failure information
3E35	System	Error	Major	Variable memory block acquisition/release ID number invalid	—	—	Failure information
3E36	System	Error	Major	Variable memory block acquisition/release context error	—	—	Failure information
3E37	System	Error	Major	Error in forced cancellation of waiting for variable memory block acquisition/release	—	—	Failure information
3E38	System	Error	Major	Error in forced cancellation of waiting due to reset of variable memory block acquisition/release object	—	—	Failure information
3E39	System	Error	Major	Variable memory block acquisition/release parameter error	—	—	Failure information
3E3A	System	Error	Major	E-mail box transmitting/receiving parameter error	—	—	Failure information
3E3B	System	Error	Major	E-mail box transmitting/receiving ID number invalid	—	—	Failure information
3E3C	System	Error	Major	E-mail box transmitting/receiving context error	—	—	Failure information
3E3D	System	Error	Major	Error in forced cancellation of waiting for e-mail box transmitting/receiving	—	—	Failure information
3E3E	System	Error	Major	Semaphore acquisition/release parameter error	—	—	Failure information
3E3F	System	Error	Major	Invalid semaphore acquisition/release ID number	—	—	Failure information
3E40	System	Error	Major	Semaphore acquisition/release context error	—	—	Failure information
3E41	System	Error	Major	Semaphore acquisition/release queuing overflow	—	—	Failure information
3E42	System	Error	Major	Error in forced cancellation of waiting for semaphore acquisition/release	—	—	Failure information
3E60 to 3E63	System	Error	Major	MPU error	—	—	Failure information
3FA1	System	Error	Major	Memory error	—	—	Failure information
C050	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C051	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C052	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C053	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C054	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C058	System	Error	Minor	Ethernet communication error	Parameter information	—	—

Event code	Event type	Event category	Event status	Detected event	Detailed information		
					Detailed information 1	Detailed information 2	Detailed information 3
C059	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C05B	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C05C	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C05E	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C05F	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C060	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C061	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C06F	System	Error	Minor	Ethernet communication error	Parameter information	—	—
C0D8	System	Error	Minor	Ethernet communication error	Parameter information	—	—

*1 <Number of times information>

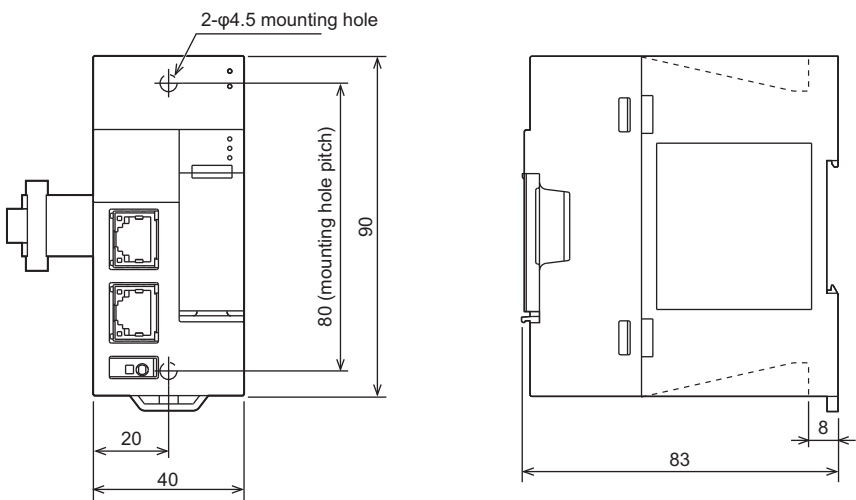
- Number of times (set value)

*2 <Parameter information>

- Parameter storage location
- Parameter type
- (I/O No.)
- (Parameter number)
- Parameter item number

APPENDIX

Appendix 1 External Dimensions



(Unit: mm)

Appendix 2 Standards

Certification of UL, cUL standards

The FX5-EIP supports UL (UL, cUL) standards.

UL, cUL file number: E95239

For models that support UL standards, please contact your local Mitsubishi representative.

Compliance with EU Directive (CE marking)

This note does not guarantee that an entire machine produced in accordance with the contents of this note will comply with the following standards.

Compliance to EMC Directive and LVD Directive of the entire mechanical module should be checked by the user/ manufacturer. For more details, please contact your local Mitsubishi representative.

Requirement for compliance with EMC Directive

The following products have shown compliance through direct testing (of the identified standards below) and design analysis (through the creation of a technical construction file) to the European Directive for Electromagnetic Compatibility (2014/30/ EU) when used as directed by the appropriate documentation.

Attention

This product is designed for use in industrial applications.

Product compatibility

Type: Programmable controller (open type equipment)

Models: FX5 manufactured

from October 1st, 2025	FX5-EIP
Electromagnetic compatibility (EMC) directive	Remarks
EN 61131-2:2007 Programmable controllers - Equipment requirements and tests	Compliance with all relevant aspects of the standard. 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

Caution for compliance with EU Directive

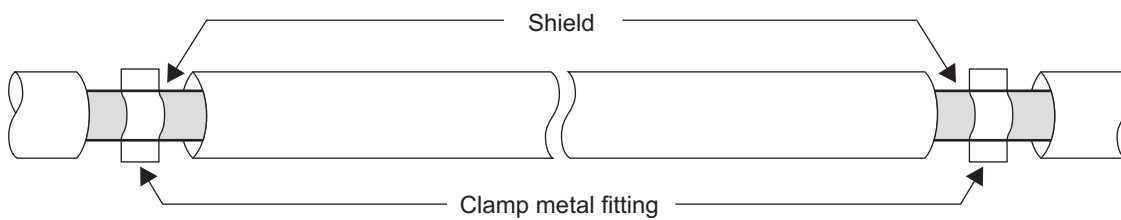
Caution for when this product is used

When using this product, attach a ferrite core to the power supply of the CPU module. Wrap the power cable around the ferrite core by one. The distance between the ferrite core and the terminal block or the connector connected to the power cable must be approx. 200mm or shorter. (Ferrite core used for the tests conducted by Mitsubishi: E04SR401938 manufactured by SEIWA ELECTRIC MFG. CO., LTD.)

Caution for when the Ethernet port is used

Use a shielded twisted pair cable for the 10BASE-T or 100BASE-TX cable.

Strip a part of the jacket of the shielded twisted pair cable as shown below and ground the exposed shield to the largest area, at the both ends of the cable.



Compliance with UKCA marking

The requirements for compliance with UKCA marking are the same as that with EU directive (CE marking).

Appendix 3 Module Label

The buffer memory of the FX5-EIP can be set using a module label.

The availability of some module labels depends on the maximum number of connections.

If the maximum number of connections is 64, use the module label "EtherNet/IP common area (64 connections)". If the maximum number of connections is 128, use the module label "EtherNet/IP common area (128 connections)".

Structure of the module label

The module label name is defined with the following structure.

- "instance name"_"data format"_"label name"_D
- "instance name"_"data format"_"data type"_"label name"_D

■Instance name

The instance name of the FX5-EIP is as follows.

Model	Instance name
FX5-EIP	FX5EIP

Ex.

FX5EIP_unStatus_LatestError_D

■Data format

The data format indicates the size of a buffer memory area. The classifications are as follows.

Data format	Description
b	Bit
bn	Bit of multiple buffer memory areas
u	Word [Unsigned]/Bit String [16-bit]
ud	Double word [Unsigned]/Bit String [32-bit]
un	Word of multiple buffer memory areas [Unsigned]/Bit String [16-bit]

■Data type

The data type indicates the type of a buffer memory area. The classifications are as follows.

Data type	Description
Val	Displays the value of a module.
Set	Sets the module control instruction.
Sts	Displays the module status.

■Label name

The label name is unique to the module.

■_D

This symbol indicates that the module label is for direct access. Value update timing is shown below.

Type	Description	Access timing
Direct access	The values read/written from/to the module labels are reflected to the module immediately.	At writing to or reading from the module label

Appendix 4 Buffer Memory

The buffer memory is used to exchange data between the FX5-EIP module and the CPU module. Buffer memory values are returned to their defaults (initial values) when the system is powered off or the CPU module is reset.

List of buffer memory addresses

64 connections: 64 maximum/128 connections: 128 maximum, R: Read/W: Write

Address (decimal)		Address (hexadecimal)		Name		Initial value	R/W
64 connections	128 connections	64 connections	128 connections				
29		1DH		Common area (module information)	Latest error code	0	R
30		1EH			Module information	69C3H	R
31		1FH			Firmware version	*1	R
34 to 35		22H to 23H			Input signals	0	R/W
36 to 37		24H to 25H			Output signals	0	R/W
50 to 51		32H to 33H			IP address setting	0.0.0.0	R/W
52 to 53		34H to 35H			Subnet mask pattern setting	0.0.0.0	R/W
54 to 55		36H to 37H			Default router IP address setting	0.0.0.0	R/W
56		38H			IP address storage area write request	0	R/W
57		39H			IP address storage area write status	0	R
58		3AH			IP address storage area clear request	0	R/W
59		3BH			IP address storage area clear status	0	R
60		3CH			IP address change function enable flag	0	R
61		3DH			IP address storage area write error code	0	R
62		3EH			IP address storage area clear error code	0	R
64 to 65		40H to 41H			IP address	192.168.3.251	R
74 to 75		4AH to 4BH			Subnet mask pattern	255.255.255.0	R
76 to 77		4CH to 4DH			Default gateway IP address	0.0.0.0	R
102 to 104		66H to 68H			Ethernet address (MAC address)	*2	R
105		69H			MELSOFT connection TCP port number	5554	R
106		6AH			MELSOFT connection UDP port number	5555	R
107		6BH			MELSOFT direct connection port number	5552	R
108 to 139		6CH to 8BH			Error code	0	R
152 to 153		98H to 99H			Open completion signal	0	R
154 to 155		9AH to 9BH			Open request signal	0	R
156 to 157		9CH to 9DH			Socket communications receive status signal	0	R
158		9EH			Initial status	0	R
201		C9H			IP address duplication status	0	R
202 to 204		CAH to CCH			MAC address of the already connected station	0	R
205 to 207		CDH to CFH			MAC address of the station connected later	0	R

Address (decimal)		Address (hexadecimal)		Name		Initial value	R/W	
64 connections	128 connections	64 connections	128 connections					
224		E0H		EtherNet/IP communication setting	Maximum number of connections		*3	R
228		E4H			Auto refresh status		*3	R
232		E8H			Assurance of input/output data	Block assurance specification per connection	0	R/W
233		E9H				Block assurance state per connection	0	R
240		F0H			PING test request area	Communication time check	0	R/W
241		F1H				Transmission count	0	R/W
242 to 243		F2H				IP Address	0	R/W
244		F4H			PING test response area	Total packet transmission count	0	R
245		F5H				Receive count	0	R
246		F6H				Loss count	0	R
247 to 256		F7H				Error code	0	R
272		110H			EtherNet/IP communication control	EtherNet/IP communication start request	0	R/W
273		111H				EtherNet/IP communication start status	0	R
274		112H				EtherNet/IP communication continuation specification request	0	R/W
275		113H				EtherNet/IP data link continuation specification state	0	R
304 to 367	304 to 431	130H to 16FH	130H to 1AFH	I/O data common information	I/O data size	Input data size	0	R
432 to 495	432 to 559	1B0H to 1EFH	1B0H to 22FH			Output/message communication (server) data size	0	R
560 to 687	560 to 815	230H to 2AFH	230H to 32FH		I/O data buffer memory address	Input data buffer memory address	0	R
816 to 943	816 to 1071	330H to 3AFH	330H to 42FH			Output/message communication (server) data buffer memory address	0	R
1072 to 1135	1072 to 1199	430H to 46FH	430H to 4AFH		Block assurance specification per connection	Input data update status	0	R/W
1200 to 1263	1200 to 1327	4B0H to 4EFH	4B0H to 52FH			Output data update status	0	R/W

Address (decimal)		Address (hexadecimal)		Name			Initial value	R/W
64 connections	128 connections	64 connections	128 connections					
1328 to 1331	1328 to 1335	530H to 533H	530H to 537H	Cyclic communication	Communication status	Data link status	0	R
1336 to 1339	1336 to 1343	538H to 53BH	538H to 53FH			Error status	0	R
1344 to 1347	1344 to 1351	540H to 543H	540H to 547H			Reserved node	0	R
1360 to 1363	1360 to 1367	550H to 553H	550H to 557H		Cyclic communication pause specification		0	R/W
1368 to 1371	1368 to 1375	558H to 55BH	558H to 55FH		Cyclic communication pause status		0	R
1392 to 1393		570H to 571H			Connection behavior error status Input	Connection 1	0	R
1394 to 1519	1394 to 1647	572H to 5EFH	572H to 66FH			Connections 2 to 64/128	0	R
1648 to 1649		670H to 671H			Connection behavior error status Output	Connection 1	0	R
1650 to 1775	1650 to 1903	672H to 6EFH	672H to 76FH			Connections 2 to 64/128	0	R
1920 to 1921		780H to 781H			Connection information area Connection number 1 Diagnostic	Production Connection ID	0	R
1922 to 1923		782H to 783H				Consumption Connection ID	0	R
1924 to 1925		784H to 785H				O->T API (us)	0	R
1926 to 1927		786H to 787H				T->O API (us)	0	R
1928 to 1929		788H to 789H				O->T RPI (us)	0	R
1930 to 1931		78AH to 78BH				T->O RPI (us)	0	R
1932 to 1933		78CH to 78DH				O->T Net Parameters	0	R
1934 to 1935		78EH to 78FH				T->O Net Parameters	0	R
1936		790H				Originator Connection Serial Number	0	R
1937		791H				Originator Vendor Id	0	R
1938 to 1939		792H to 793H				Originator Serial Number	0	R
1940 to 3199	1940 to 4479	794H to C7FH	794H to 117FH		Connection information area Connection numbers 2 to 64/128	Same as connection number 1	0	R

Address (decimal)		Address (hexadecimal)		Name		Initial value	R/W		
64 connections	128 connections	64 connections	128 connections						
4496	4496	1190H	1190H	Message communications	Execution request flag (1st)		0	R/W	
4497 to 4559	4497 to 4623	1191H to 11CFH	1191H to 120FH		Execution request flag (2nd to 64th/128th)		0	R/W	
4640 to 4643	4640 to 4647	1220H to 1223H	1220H to 1227H		Message communication status	Message communication reserved node	0	R	
4656		1230H			Message communication area (1st) Request area	Communication type specification	UCMM communications not available: 0 UCMM communications: 1 Class3 communications: 2		R/W
4657		1231H					Communication method specification	Class3 communication: Parameter setting followed Other than Class3 communications: 0	R/W
4658		1232H					Service		R/W
4659 to 4660		1233H to 1234H					Target IP Address		R/W
4661		1235H					RPI		R/W
4662		1236H					Timeout Multiplier		R
4663		1237H					Trigger Type		R/W
4664		1238H					Path Segment specification (Segment Size)		R/W
4665 to 4668		1239H to 123CH					Path Segment specification (Path Segment)		R/W
4669		123DH					Data Type		R/W
4670		123EH					Class		R/W
4671		123FH					Instance		R/W
4672		1240H					Attribute		R/W
4673 to 4800		1241H to 12C0H					Tag Name		R/W
4816		12D0H			Message communication area (1st) Response area	Result storage area	0	R	
4817 to 4818		12D1H to 12D2H				CIP response code	0	R	
4819		12D3H				Data Type	0	R	
4820		12D4H				Class	0	R	
4821		12D5H				Instance	0	R	
4822		12D6H				Attribute	0	R	
4823 to 4824		12D7H to 12D8H				Execution completion count	0	R	
4848 to 16943	4848 to 29231	12F0H to 422FH	12F0H to 722FH		Data area	Message communication areas (2nd to 64th/128th)		(Refer to the first one.)	—
16944 to 17665	32560 to 32859	4230H to 4501H	7F30H to 805BH	Input data area (1st)		0	R		
17666 to 63151	32860 to 70959	4502H to F6AFH	805CH to 1152FH	Input data areas (2nd to 64th/128th)		0	R		
63152 to 63873	70960 to 71259	F6B0H to F981H	11530H to 1165BH	Output/message communication (server) data area (1st)		0	R/W		
63874 to 109359	71260 to 109359	F982H to 1AB2FH	1165CH to 1AB2FH	Output/message communication (server) data areas (2nd to 64th/128th)		0	R/W		
110116		1AE24H		Number of consumed connections	For Class1/Class3 communication		0	R	

*1 The firmware version of the FX5-EIP is stored. For Ver.1.000, 1000 is stored.

*2 MAC address written before shipment

*3 Module parameter setting value

Details of buffer memory addresses (module status G29 to G207)

Common area (module information)

■Latest error code (Un\G29)

The latest error code that has occurred in the FX5-EIP is stored. (0 is stored when conditions are normal.)

For details on error codes, refer to  Page 192 Module error.

■Module information (Un\G30)

Stores module specific information.

For the FX5-EIP, a unique code (69C3H) is stored.

■Firmware version (Un\G31)

Stores the firmware version of the FX5-EIP.

Ex.

When the firmware version of the FX5-EIP is Ver.1.000: K1000

■Input signals (Un\G34 to Un\G35)

These signals are used to check the communication status of the FX5-EIP.

Address	bit	Signal name	Description
Un\G34	b14	Module error status	A signal for checking the occurrence of error (minor/moderate/major) of the FX5-EIP • On: Error occurrence (minor/moderate/major) • Off: No error When the signal is turned on (an error occurs), eliminate the error cause, and turn on 'Module error clear request' (Un\G36.b15). Then, the signal will be turned off.
	b15	Module ready	A signal for checking the status of completion of preparation for operation of the FX5-EIP • On: Available for module operation • Off: Not available for module operation (in preparation)
Un\G35	b2	PING test completion	A signal that turns on or off depending on the execution status of the PING test • On: PING test execution completed • Off: PING test execution not completed
	b15	Communication Ready	A signal that turns on when the FX5-EIP communication preparation has completed • On: Communication preparation completed • Off: Communication preparation in progress

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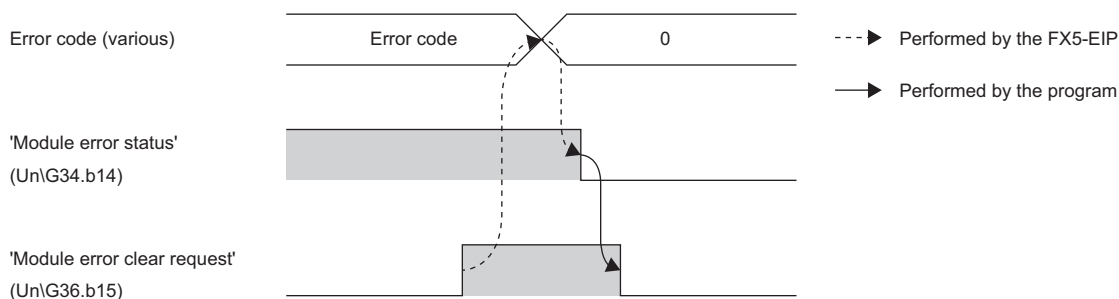
■Output signals (Un\G36 to Un\G37)

These signals are used to control the FX5-EIP.

Address	bit	Signal name	Description
Un\G36	b15	Module error clear request	Requests to clear the error that has occurred in the FX5-EIP. To request to clear the module error, turn on and off the signal. Issuing the request after the cause of the error is removed will clear the following items. <ul style="list-style-type: none"> • Turning off of 'Module error status' (Un\G34.b14) • ERROR LED • The following buffer memory areas <ul style="list-style-type: none"> - 'Latest error code' (Un\G29) - 'IP address storage area write error code' (Un\G61) - 'IP address storage area clear error code' (Un\G62) - 'Error code' (Un\G108 to Un\G139) - 'IP address duplication status area' (Un\G201) - 'MAC address of the already connected station' (Un\G202 to Un\G204) - 'MAC address of the station connected later' (Un\G205 to Un\G207)

Point

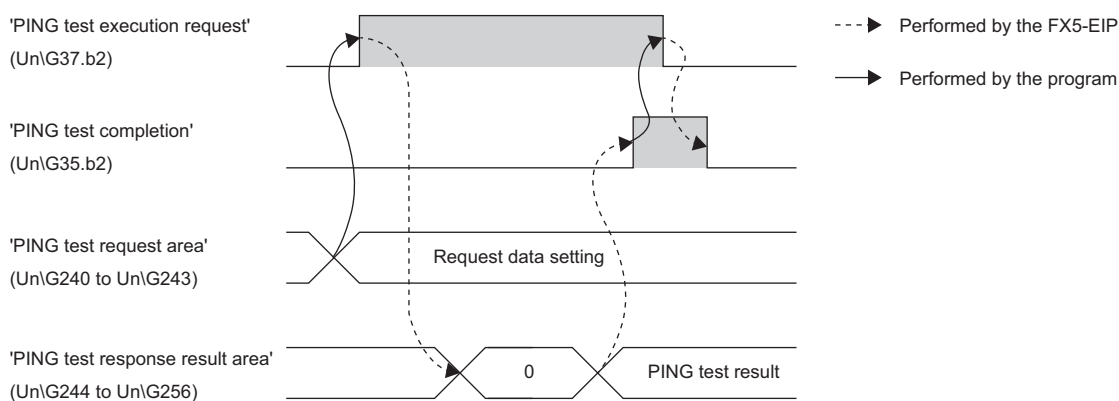
- Turn off 'Module error clear request' (Un\G36.b15) at the following timing using 'Module error status' (Un\G34.b14) as an interlock condition.



Address	bit	Signal name	Description
Un\G37	b2	PING test execution request	A signal that turns on to execute a PING test <ul style="list-style-type: none"> • On: PING test execution request • Off: PING test completion request

Point

- Turning on 'PING test execution request' (Un\G37.b2) clears 'PING test response area' (Un\G244 to Un\G256). Turning off 'PING test execution request' (Un\G37.b2) turns 'PING test completion' (Un\G35.b2) off.



■IP address setting (Un\G50 to Un\G51)

The IP address to be set is stored when using IP address change function.

When writing to IP address storage area is completed normally, 0 is stored.

Address	Description
Un\G50	3rd octet, 4th octet
Un\G51	1st octet, 2nd octet

Ex.

When IP address is 192.168.3.251: Un\G50 = H03FB, Un\G51 = HC0A8

■Subnet mask pattern setting (Un\G52 to Un\G53)

The subnet mask pattern to be set is stored when using IP address change function.

When writing to IP address storage area is completed normally, 0 is stored.

Address	Description
Un\G52	3rd octet, 4th octet
Un\G53	1st octet, 2nd octet

Ex.

When subnet mask pattern is 255.255.255.0: Un\G52 = HFF00, Un\G53 = HFFFF

■Default router IP address setting (Un\G54 to Un\G55)

The default router IP address to be set is stored when using IP address change function.

When writing to IP address storage area is completed normally, 0 is stored.

Address	Description
Un\G54	3rd octet, 4th octet
Un\G55	1st octet, 2nd octet

Ex.

When default router IP address is 192.168.3.254: Un\G54 = H03FE, Un\G55 = HC0A8

■IP address storage area write request (Un\G56)

Set whether to write to the IP address storage area when using the IP address change function.

- 0: Not write
- 1: Write

■IP address storage area write status (Un\G57)

The execution status of writing to the IP address storage area during the execution of the IP address change function can be checked.

Address	bit	Name	Description
Un\G57	b0	IP address storage area write completed	Turns on when writing to IP address storage area completes. It also turns on when writing is completed with an error. Turns off when 'IP address storage area write request' (Un\G56) is changed from 1 to 0.
	b1	IP address storage area write error	Turns on when writing to IP address storage area fails. It also turns on if there is any error for data in the IP address storage area when the FX5-EIP is powered off and on. Turns off when 'IP address storage area write request' (Un\G56) is changed from 1 to 0.

■IP address storage area clear request (Un\G58)

Set whether to clear the data in the IP address storage area.

- 0: Not clear
- 1: Clear

■IP address storage area clear status (Un\G59)

The clear execution status in the IP address storage area can be checked.

Address	bit	Name	Description
Un\G59	b0	IP address storage area clear completed	Turns on when clearing of IP address storage area completes. It also turns on when clearing is completed with an error. Turns off when 'IP address storage area clear request' (Un\G58) is changed from 1 to 0.
	b1	IP address storage area clear error	Turns on when clearing of IP address storage area fails. Turns off when 'IP address storage area clear request' (Un\G58) is changed from 1 to 0.

■IP address change function enable flag (Un\G60)

The status (enabled or disabled) of the IP address change function is stored.

- 0: Disable
- 1: Enable

■IP address storage area write error code (Un\G61)

The error code is stored if writing to the IP address storage area fails.

- 0: Normal (no error)
- 1920H: Values such as IP address setting (Un\G50 to Un\G55) are out of the setting ranges

■IP address storage area clear error code (Un\G62)

The error code is stored if clearing the IP address storage area fails.

- 0: Normal (no error)
- 1921H: 'IP address storage area write request' (Un\G56) and 'IP address storage area clear request' (Un\G58) were simultaneously turned on.

■IP address (Un\G64 to Un\G65)

The IP address on the own station set with GX Works3 is stored. ( Page 90 Basic Settings) The stored values can be changed by the IP address change function.

Address	Description
Un\G64	3rd octet, 4th octet
Un\G65	1st octet, 2nd octet

Ex.

When IP address is 192.168.3.250: Un\G64 = H03FA, Un\G65 = HC0A8

Point

If the IP address is changed by the IP address change function, priority will be given to the IP address stored by the IP address change function. To enable the setting value in GX Works3, clear the IP address storage area.

■Subnet mask pattern (Un\G74 to Un\G75)

The subnet mask pattern on the own station set with GX Works3 is stored. ( Page 90 Basic Settings) The stored values can be changed by the IP address change function.

Address	Description
Un\G74	3rd octet, 4th octet
Un\G75	1st octet, 2nd octet

Point

If the subnet mask pattern is changed by the IP address change function, priority will be given to the subnet mask pattern stored by the IP address change function. To enable the setting value in GX Works3, clear the IP address storage area.

Ex.

When subnet mask pattern is 255.255.255.0: Un\G74 = HFF00, Un\G75 = HFFFF

■Default gateway IP address (Un\G76 to Un\G77)

The default gateway IP address on the own station set with GX Works3 is stored. ( Page 90 Basic Settings) The stored values can be changed by the IP address change function.

Address	Description
Un\G76	3rd octet, 4th octet
Un\G77	1st octet, 2nd octet

Ex.

When default gateway IP address is 192.168.3.254: Un\G76 = H03FE, Un\G77 = HC0A8

Point

If the default gateway IP address is changed by the IP address change function, priority will be given to the default gateway IP address stored by the IP address change function. To enable the setting value in GX Works3, clear the IP address storage area.

■Ethernet address (MAC address) (Un\G102 to Un\G104)

The Ethernet address (MAC address) on the own station is stored.

Address	Description
Un\G102	5th octet, 6th octet
Un\G103	3rd octet, 4th octet
Un\G104	1st octet, 2nd octet

Ex.

When MAC address is 00-26-92-60-10-25: Un\G102 = H1025, Un\G103 = H9260, Un\G104 = H0026

■MELSOFT connection TCP port number (Un\G105)

The MELSOFT connection TCP port number is stored.

■MELSOFT connection UDP port number (Un\G106)

The MELSOFT connection UDP port number is stored.

■MELSOFT direct connection port number (Un\G107)

The MELSOFT direct connection port number is stored.

■Error code (Un\G108 to Un\G139)

The error code (connection numbers 1 to 32) of standard Ethernet is stored. (0 is stored when conditions are normal.) For details on error codes, refer to  Page 192 Module error.

Address	Description
Un\G108	The error code of connection number 1 is stored.
Un\G109	The error code of connection number 2 is stored.
⋮	
Un\G139	The error code of connection number 32 is stored.

■Open completion signal (Un\G152 to Un\G153)

The following lists the open completion signal for each connection number in socket communications.

Address	bit	Connection number	Description
Un\G152	b0	Connection number 1	• On: Open completed • Off: Closed or not open
	b1	Connection number 2	
	⋮		
	b15	Connection number 16	
Un\G153	b0 to b15	Connection number 17 to 32	

■Open request signal (Un\G154 to Un\G155)

The following lists the open request signal for each connection number in socket communications.

Address	bit	Connection number	Description
Un\G154	b0	Connection number 1	<ul style="list-style-type: none">• On: Requesting open• Off: No open request
	b1	Connection number 2	
	⋮		
	b15	Connection number 16	
Un\G155	b0 to b15	Connection number 17 to 32	

■Socket communication receive status signal (Un\G156 to Un\G157)

The following lists the socket communication receive status signal for each connection number.

Address	bit	Connection number	Description
Un\G156	b0	Connection number 1	<ul style="list-style-type: none">• On: Data reception completed• Off: Data not received
	b1	Connection number 2	
	⋮		
	b15	Connection number 16	
Un\G157	b0 to b15	Connection number 17 to 32	

■Initial status (Un\G158)

Whether or not the FX5-EIP has been initialized can be checked.

Address	bit	Name	Description
Un\G158	b0	Initial normal completion status	Turns on when the initialization is normally completed.
	b1	Initial abnormal completion status	Turns on when the initialization is completed with an error.

■IP address duplication status (Un\G201)

IP address duplication status is stored.

Address	bit	Name	Description
Un\G201	b0	Same IP address detection flag	Turns on if there is a duplicate IP address.

■MAC address of the already connected station (Un\G202 to Un\G204)

When a duplicate IP address is detected, the MAC address of the previously connected node is stored in the following order.

Address	Description
Un\G202	5th octet, 6th octet
Un\G203	3rd octet, 4th octet
Un\G204	1st octet, 2nd octet

Ex.

When MAC address is 00-26-92-60-10-25: Un\G202 = H1025, Un\G203 = H9260, Un\G204 = H0026
"FFFFFFFFFFFFH" is stored in the node that has been already connected to the network.

■MAC address of the station connected later (Un\G205 to Un\G207)

When a duplicate IP address is detected, the MAC address of the node connected later is stored in the following order.

Address	Description
Un\G205	5th octet, 6th octet
Un\G206	3rd octet, 4th octet
Un\G207	1st octet, 2nd octet

Ex.

When MAC address is 00-26-92-60-10-25: Un\G205 = H1025, Un\G206 = H9260, Un\G207 = H0026
"FFFFFFFFFFFFH" is stored in the node with duplicated IP address.

Details of buffer memory addresses (EtherNet/IP communication settings G224 to G275)

Maximum number of connections

■Maximum number of connections (Un\G224)

The value according to the parameter selected in the "Maximum Number of Connections Setting" parameter setting is stored.

- 64: 64 connections are set.
- 128: 128 connections are set.

Auto refresh processing

■Auto refresh status (Un\G228)

The state of whether or not auto refresh is applied to the cyclic communication input or output data is stored.

If auto refresh for input data and auto refresh for output data are set for even a single connection, the value other than 0 will be set.

- Auto refresh for input data: Data transferred from network module to CPU module
- Auto refresh for output data: Data transferred from CPU module to network module

Address	Value	Description
Un\G228	0	Auto refresh is not set.
	1	Auto refresh is set only for output data.
	2	Auto refresh is set only for input data.
	3	Auto refresh is set for both input and output data.

Assurance of input/output data

■Block assurance specification per connection (Un\G232)

Set whether to assure the input or output data used in cyclic communication or message communication. The setting is reflected when 'EtherNet/IP communication start request' (Un\G272) is changed from "0: Stop request" to "Other than 0: Start request".

 Page 81 Assurance of input/output data

- 0 (0H): Not assured
- 16 (10H): Assured

■Block assurance state per connection (Un\G233)

The data assurance status for the input data or output data of the cyclic communication or message communication being executed is stored.

The setting is reflected when 'EtherNet/IP communication start request' (Un\G272) is changed from "0: Stop request" to "Other than 0: Start request".

- 0: EtherNet/IP communication is stopped.
- 1: Not data assured
- 2: Data assured

PING test request area

■Communication time check (Un\G240)

Set the PING test completion waiting time.

- 0: Operations are performed after one second.
- 1 to 5: Operations are performed after the set number of seconds.
- 6 or higher: Operations are performed after five seconds.

■Transmission count (Un\G241)

Set the number of transmission times.

- 0: One transmission is performed.
- 1 to 10: Transmissions are performed for the set number of times.
- 11 or higher: 10 transmissions are performed.

■IP Address (Un\G242 to Un\G243)

Set the IP address of the PING test target device.

Address	Description
Un\G242	3rd octet, 4th octet
Un\G243	1st octet, 2nd octet

Ex.

When IP address is 192.1.0.254: Un\G242 = H00FE, Un\G243 = HC001

Precautions

The following IP addresses cannot be set.

- Own node IP address
- Network address of the network to which the own node belongs (an IP address in which all bits in the host part^{*1} are 0)
- Broadcast address of the network to which the own node belongs (an IP address in which all bits in the host part^{*1} are 1)

^{*1} This refers to the bits where the subnet mask is 0. If the subnet mask is not set, the following subnet masks are applied depending on the FX5-EIP IP address class.

- Class A (IP address start bit string is 0) → Subnet mask: 255.0.0.0
- Class B (IP address start bit string is 10) → Subnet mask: 255.255.0.0
- Class C (IP address start bit string is 110) → Subnet mask: 255.255.255.0

Ex.

If the IP address of the own node is 192.168.3.4 and the subnet mask is 255.255.0.0, the following addresses cannot be set.

- Own node IP address: 192.168.3.4
- Network address: 192.168.0.0
- Broadcast address: 192.168.255.255

PING test response area

■Total packet transmission count (Un\G244)

The total number of times packets were transmitted during the PING test is stored.

■Receive count (Un\G245)

The total number of times packets were received during the PING test is stored.

■Loss count (Un\G246)

The number of times transmissions were timed out during the PING test is stored.

The error code is not registered when a timeout loss occurs.

■Error code (Un\G247 to Un\G256)

The error codes that occur during the PING test are stored in the order of transmission.

The PING test execution is ended if an error occurs.

For details, refer to  Page 198 Error codes upon execution of a PING test.

EtherNet/IP communication control

■EtherNet/IP communication start request (Un\G272)

Request to start the EtherNet/IP communication.

- 0: Stop request
- Other than 0: Start request

Point

To start EtherNet/IP communications by setting a value other than 0 for 'EtherNet/IP communication start request' (Un\G272), set all 'Cyclic communication pause specification' (Un\G1360 to Un\G1367) to 0. When 'Cyclic communication pause specification' (Un\G1360 to Un\G1367) is not all set to 0, EtherNet/IP communications will not start even if a value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).

In this case, 2 (Cannot start) is stored for 'EtherNet/IP communication start status' (Un\G273).

■EtherNet/IP communication start status (Un\G273)

This monitor area indicates whether the EtherNet/IP communication has started.

- 0: Stopped
- 1: Operating
- 2: Cannot start (if one of the bits in 'Cyclic communication pause specification' (Un\G1360 to Un\G1367) is turned on and EtherNet/IP communication start is requested)

■EtherNet/IP communication continuation specification request (Un\G274)

Determine whether to continue or stop EtherNet/IP communication when the operating status of the CPU module changes from RUN to STOP or when a stop error occurs in the CPU module. The setting is reflected when 'EtherNet/IP communication start request' is performed.

- 0: Stop
- 16 (10H): Continue

■EtherNet/IP data link continuation specification state (Un\G275)

The setting status of 'EtherNet/IP communication continuation specification request' (Un\G274) is stored.

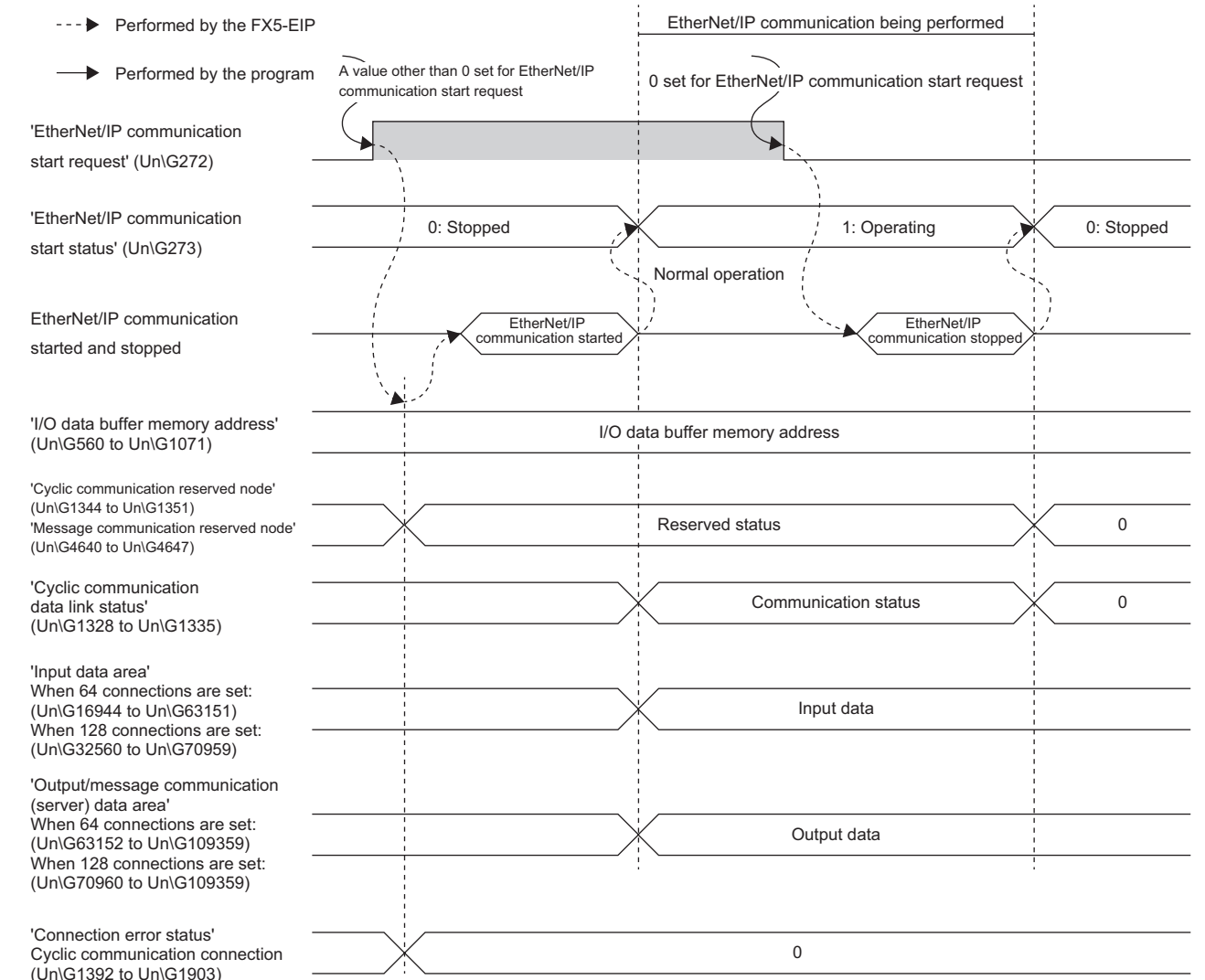
The setting is stored when an EtherNet/IP communication start request is performed.

- 1: Operating with "Continue"
- 2: Operating with "Stop"

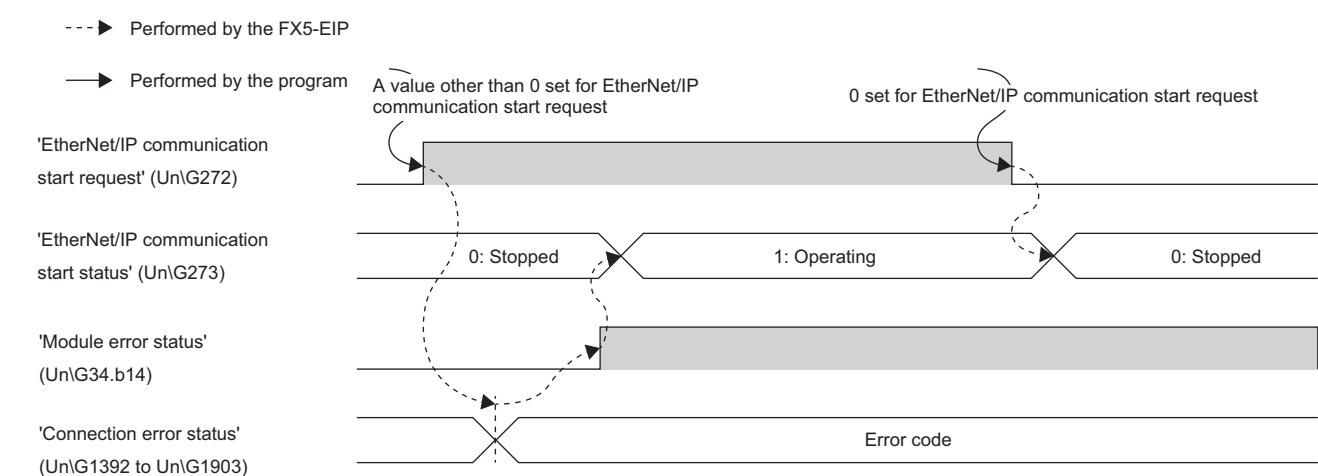
■Operation timing of EtherNet/IP communication start request (Un\G272)

The operation timing of the EtherNet/IP communication by turning on 'EtherNet/IP communication start request' (Un\G272) is shown below.

- EtherNet/IP communication has started (normal)



- EtherNet/IP communication does not start (error)



■Communication control by EtherNet/IP data link continuation specification state

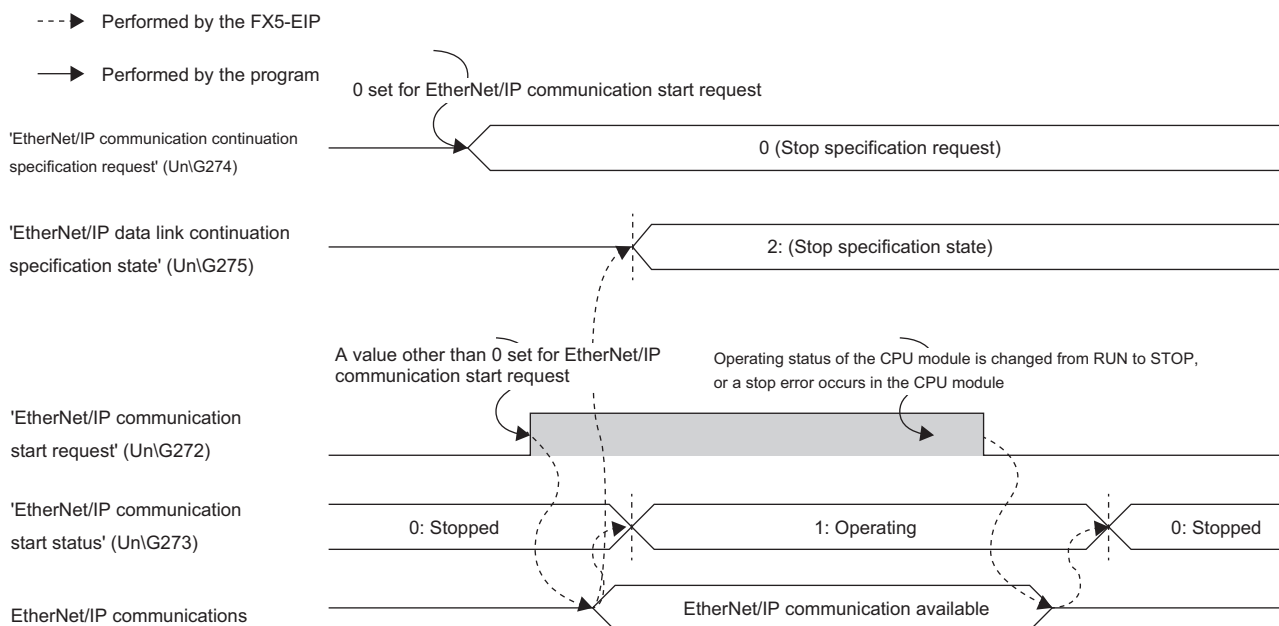
Control of the EtherNet/IP communication available state differs depending on the state of 'EtherNet/IP data link continuation specification state' (Un\G275).

When 'EtherNet/IP data link continuation specification state' (Un\G275) is active with "2: Stop" and the CPU module changes to RUN to STOP or a stop error occurs in the CPU module, EtherNet/IP communication will stop. ('EtherNet/IP communication start request' (Un\G272) is off.)

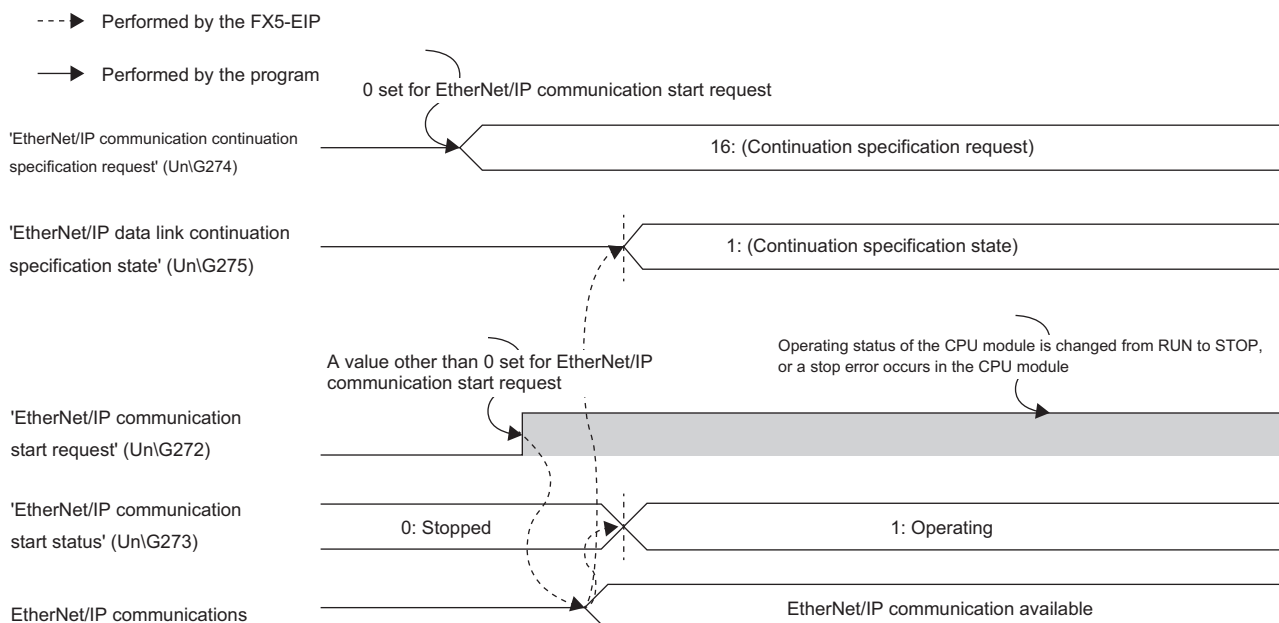
Even when 'EtherNet/IP data link continuation specification state' (Un\G275) is active with "1: Continue" and CPU module changes from RUN to STOP or a stop error occurs in the CPU module, EtherNet/IP communication will continue.

When 'Block assurance state per connection' (Un\G233) is operated by "2: Data assured", EtherNet/IP communications are continued but I/O data is not updated.

- When operation is in progress with EtherNet/IP data link continuation specification state set to "2: Stop"



- When operation is in progress with EtherNet/IP data link continuation specification state set to "1: Continue"



Details of buffer memory addresses (I/O data common information G304 to G1327)

I/O data size

The I/O data size is stored in the order of connection numbers 1 to 128.

■Input data size (Un\G304 to Un\G431)

Item	Description	
During cyclic communication	The size of data received by the FX5-EIP from the EtherNet/IP device is stored in bytes.	
During message communication (client function)	When the communication method is instance communications	<ul style="list-style-type: none"> The receive data size of the response command is stored in units of bytes. For the response data storage location, refer to the manuals of the EtherNet/IP devices as the server and secure the sufficient data size.
	When the communication method is tag communication	<ul style="list-style-type: none"> For a read request (Service is 'Class3/UCMM Read Originator'), the size of the response data from the transmitting EtherNet/IP device is stored as the number of data type elements. For a write request ('Class3/UCMM Write Originator' for Service), 0 is stored.

■Output/message communication (server) data size (Un\G432 to Un\G559)

Item	Description
During cyclic communication	The size of the data transmitted from the FX5-EIP to the EtherNet/IP device is stored in bytes.
During message communication (client function)	Set the request data size. For details on request data size, refer to  Page 124 Buffer memory settings. For the allowable data size settings, refer to  Page 241 Data Size setting range. For Class3 communication only, the value set in the parameter is stored when the module starts and cannot be changed.
Message communication (server function) tag communications	The tag size that is the target of Read/Write in Class3 tag communication is stored in bytes.

■Data Size setting range

The size available for message communication differs depending on the parameters used. (When performing Class3 communications, settings need to be configured in "EtherNet/IP Configuration", including Data Size.)

The available size differs depending on the setting of 'Message communication request area' (Un\G4656 onwards).

- For UCMM instance communications

The range of data sizes that can be requested when performing UCMM instance communications is as follows. ^{*1}(Unit: bytes)

- Minimum size: 0
- Maximum size: 496 - "additional header size"

When the following parameters are set, 2 bytes are added to each of them as additional header size.

- The Class setting value is "0100H to FFFFH" (no need to add if the setting value is "0000H to 00FFH").
- The Instance setting value is "0100H to FFFFH" (no need to add if the setting value is "0000H to 00FFH").
- The attribute setting value is "0100H to FFFFH" (no need to add if the setting value is "0000H to 00FFH").

For "Path Segment assigned", 14 bytes will be added as additional header size.

The additional header size is not included in the "Data Size" setting range.

^{*1} For connections configured to perform UCMM instance communications, the following values are set.

- Communication type specification: "0001H: UCMM communications" (set as the initial value)
- Communication method specification: "0001H: Instance communications" (set by a program)

Class setting value	Instance setting value	Attribute setting value	Path Segment ^{*1}	Maximum Data Size (unit: byte)
Class setting value "00FFH or less"	Instance setting value "00FFH or less"	Attribute setting value "00FFH or less"	Not available	496
			Available	482
		Attribute setting value "0100H or more"	Not available	494
			Available	480
	Instance setting value "0100H or more"	Attribute setting value "00FFH or less"	Not available	494
			Available	480
		Attribute setting value "0100H or more"	Not available	492
			Available	478
Class setting value "0100H or more"	Instance setting value "00FFH or less"	Attribute setting value "00FFH or less"	Not available	494
			Available	480
		Attribute setting value "0100H or more"	Not available	492
			Available	478
	Instance setting value "0100H or more"	Attribute setting value "00FFH or less"	Not available	492
			Available	478
		Attribute setting value "0100H or more"	Not available	490
			Available	476

^{*1} For details, refer to  Page 248 Message communication request/response area.

- UCMM tag communications

The range of data sizes that can be requested when performing UCMM tag communication is as follows. ^{*1}

^{*1} For connections configured to perform UCMM tag communications, the following values are set.

- Communication type specification: "0001H: UCMM communications" (set as the initial value)
- Communication method specification: "0002H: Tag communications" (set by a program)

Service setting value	Data Type setting value	Path Segment	Data Size setting range (decimal part is rounded down to the nearest integer)
124CH (Class3/UCMM Read Originator)	00C3H (INT)	—	Minimum size: 1 Maximum size: 249
	00C4H (DINT)		Minimum size: 1 Maximum size: 124
124DH (Class3/UCMM Write Originator)	00C3H (INT)	Not available	Minimum size: 1 Maximum size: (494 - number of tag name characters) / 2
		Available	Minimum size: 1 Maximum size: (480 - number of tag name characters) / 2
	0x00C4 (DINT)	Not available	Minimum size: 1 Maximum size: (494 - number of tag name characters) / 4
		Available	Minimum size: 1 Maximum size: (480 - number of tag name characters) / 4

- For Class3 instance communications

The range of data sizes that can be requested when performing Class3 instance communications is as follows. *1

*1 For connections configured to perform Class3 instance communications, the following values are set as the initial values.

- Communication type specification: "0002H: Class3 communications"
- Communication method specification: "0001H: Instance communications"
- Parameters set in 'EtherNet/IP Configuration'

Item	Description
Minimum size:	0
Maximum size:	If "Maximum Number of Connections Setting" is 64 connections: 1404 bytes. If "Maximum Number of Connections Setting" is 128 connections: 600 bytes

- Class3 tag communications

The range of data sizes that can be requested when performing Class3 tag communication is as follows. *1

*1 For connections configured to perform Class3 tag communications, the following values are set as the initial values.

- Communication type specification: "0002H: Class3 communications"
- Communication method specification: "0002H: Tag communications"
- Parameters set in 'EtherNet/IP Configuration'

Service setting value	Data Type setting value	Data Size setting range (decimal part is rounded down to the nearest integer)
124CH (Class3/UCMM Read Originator)	00C3H (INT)	Minimum size: 1 Maximum size: 248
	00C4H (DINT)	Minimum size: 1 Maximum size: 124
124DH (Class3/UCMM Write Originator)	00C3H (INT)	Minimum size: 1 Maximum size: (492 - number of tag name characters) / 2
	00C4H (DINT)	Minimum size: 1 Maximum size: (492 - number of tag name characters) / 4

I/O data buffer memory address

■Input data buffer memory address (Un\G560 to Un\G815)

The buffer memory address of the input data area for each connection number is stored in the area of the input data buffer memory address for that connection number.

- When 64 connections are set

Address	Value	Description
Un\G560 to Un\G687 (Areas of connection numbers 1 to 64)	16944 to 62430	Buffer memory address of the input data area for each connection number

- When 128 connections are set

Address	Value	Description
Un\G560 to Un\G815 (Areas of connection numbers 1 to 128)	32560 to 70660	Buffer memory address of the input data area for each connection number

■Output/message communication (server) data buffer memory address (Un\G816 to Un\G1071)

The buffer memory address of the output/message communication (server) data area for each connection number is stored in the area of the output/message communication (server) data buffer memory address for that connection number.

- When 64 connections are set

Address	Value	Description
Un\G816 to Un\G943 (Areas of connection numbers 1 to 64)	63152 to 108638	Buffer memory address of output/message communication (server) data area

- When 128 connections are set

Address	Value	Description
Un\G816 to Un\G1071 (Areas of connection numbers 1 to 128)	70960 to 109060	Buffer memory address of output/message communication (server) data area

Block assurance specification per connection

■Input data update status (Un\G1072 to Un\G1199)

If 'Block assurance state per connection' (Un\G233) is "2: Data assured", the update status of the input data is stored in the order of connection numbers 1 to 128.

Address	Value	Description
Un\G1072 to Un\G1199	0	No update available or data reading finished ^{*1}
	1	Update available

^{*1} If a program is used to read the input data after the input data is updated, change the value of this buffer memory address from 1 to 0 by the program. If function blocks are used, this operation does not need to be implemented in the user program because it is performed by the function blocks.

■Output data update status (Un\G1200 to Un\G1327)

If 'Block assurance state per connection' (Un\G233) is "2: Data assured", the update status of the output data is stored in the order of connection numbers 1 to 128.

Address	Value	Description
Un\G1200 to Un\G1327	0	No update available or data reading finished
	1	Update available ^{*1}

^{*1} If a program is used to write the output data, change the value of this buffer memory address from 0 to 1 by the program. If function blocks are used, this operation does not need to be implemented in the user program because it is performed by the function blocks.

Details of buffer memory addresses (cyclic communication G1328 to G4479)

Cyclic communication status

The cyclic communication status is stored for each connection number.

■Cyclic communication data link status (Un\G1328 to Un\G1335)

The data link status of connection numbers 1 to 128 is stored.

It automatically turns on when communication recovers from an error.

This area is enabled when 'EtherNet/IP communication start status' (Un\G273) is 1 (Operating).

- On: Connection established
- Off: Error caused by no connection settings, establishing connection, connection timeout, and setting mismatch

■Cyclic communication error status (Un\G1336 to Un\G1343)

The error status of connection numbers 1 to 128 is stored. It automatically turns off when communication recovers from an error.

This area is enabled when 'EtherNet/IP communication start status' (Un\G273) is 1 (Operating).

- On: Connection timeout, error caused by setting mismatch, connection error, and external device error^{*1}
- Off: No connection settings, connection established

^{*1} When the FX5-EIP is operating on the target, it turns on only when communication with all connected originators has stopped.

■Cyclic communication reserved node (Un\G1344 to Un\G1351)

The setting status of the reserved node of connection numbers 1 to 128 is stored.

- On: Reserved node
- Off: Not set as reserved node

Point

When one target device is connected to multiple originators in multicast communications, if at least one of them is communicating normally, "Cyclic communication data link status " turns on. When all connections with the originator devices are not communicating or have a communication error, "Cyclic communication data link status" turns off.

The following shows the assignment of each area in the cyclic communication status. The value of each bit indicates the connection number.

Cyclic communication data link status	Cyclic communication error status	Cyclic communication reserved node	bit															
			b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G1328	Un\G1336	Un\G1344	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G1329	Un\G1337	Un\G1345	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G1330	Un\G1338	Un\G1346	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G1331	Un\G1339	Un\G1347	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G1332	Un\G1340	Un\G1348	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G1333	Un\G1341	Un\G1349	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G1334	Un\G1342	Un\G1350	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G1335	Un\G1343	Un\G1351	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113

Cyclic communication pause

■Cyclic communication pause specification (Un\G1360 to Un\G1367)

This area specifies the connection to request cyclic communication pause among connections numbers 1 to 128.

- On: Cyclic communication pause requested
- Off: Cyclic communication pause not requested

■Cyclic communication pause status (Un\G1368 to Un\G1375)

This area stores the result of the pause request for cyclic communication connection numbers 1 to 128.

- On: Cyclic communication paused
- Off: Cyclic communication in progress

Point

When 'Cyclic communication pause specification' (Un\G1360 to Un\G1367) is not all set to 0, EtherNet/IP communications will not start even if a value other than 0 is set for 'EtherNet/IP communication start request' (Un\G272).

In this case, 2 (Cannot start) is stored for 'EtherNet/IP communication start status' (Un\G273).

The following shows the assignment of each area in cyclic communication pause. The value of each bit indicates the connection number.

Cyclic communication pause specification	Cyclic communication pause status	bit															
		b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G1360	Un\G1368	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G1361	Un\G1369	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G1362	Un\G1370	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G1363	Un\G1371	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G1364	Un\G1372	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G1365	Un\G1373	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G1366	Un\G1374	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G1367	Un\G1375	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113

A

Connection behavior error status

■Input (Un\G1392 to Un\G1393, Un\G1394 to Un\G1647)

The error code on the input side (when receiving) that occur during cyclic communication in connection numbers 1 to 128 is stored. (0 is stored when conditions are normal.)

Address	Name	Description
Un\G1392 to Un\G1393	Connection number 1	0: Normal
Un\G1394 to Un\G1647	Connection numbers 2 to 128	Other than 0: Error code (☞ Page 196 Error codes in status of each connection)

■Output (Un\G1648 to Un\G1649, Un\G1650 to Un\G1903)

The error code on the output side (when transmitting) that occur during cyclic communication in connection numbers 1 to 128 is stored. (0 is stored when conditions are normal.)

Address	Name	Description
Un\G1648 to Un\G1649	Connection number 1	0: Normal
Un\G1650 to Un\G1903	Connection numbers 2 to 128	Other than 0: Error code (☞ Page 196 Error codes in status of each connection)

Precautions

When reading the cyclic communication connection error status, note the following points to prevent data inconsistency in error codes.

- When reading the status using the BMOV/FROM instruction, specify an even number for the read size. Or, use the DMOV/DFROM instruction to read in double-word units.
- Specify an even number for the start address.

Connection information area

■Connection number 1 (Un\G1920 to Un\G1939)

The connection information for connection number 1 of the cyclic communication is stored.

Number of words	Name		Description
1st to 2nd words	Diagnostic	Production Connection ID	The transmission connection ID for the destination of the requested connection is stored.
3rd to 4th words		Consumption Connection ID	The receive connection ID for the destination of the requested connection is stored.
5th to 6th words		O→T API (μs)	The originator to target API (unit: μs) for the destination of the requested connection is stored.
7th to 8th words		T→O API (μs)	The target to originator API (unit: μs) for the destination of the requested connection is stored.
9th to 10th words		O→T RPI (μs)	The originator to target RPI (unit: μs) for the destination of the requested connection is stored.
11th to 12th words		T→O RPI (μs)	The target to originator RPI (unit: μs) for the destination of the requested connection is stored.
13th to 14th words		O→T Net Parameters	The originator to target network parameter for the destination of the requested connection is stored.
15th to 16th words		T→O Net Parameters	The target to originator network parameter for the destination of the requested connection is stored.
17th word		Originator Connection Serial Number	The originator connection serial number is stored.
18th word		Originator Vendor Id	The originator vendor ID is stored.
19th to 20th words		Originator Serial Number	The originator serial number is stored.

■Connection numbers 2 to 128 (Un\G1940 to Un\G4479)

The connection information for cyclic communication connection numbers 2 to 128 in the order of 2 to 128 is stored.

The details of the connection number 2 to 128 are the same as the first one. When the nth area is used, each address value is calculated by adding $20 \times (\text{nth area} - 1)$ to the first address value.

Precautions

When reading a two-word size area in the cyclic communication connection information area, note the following points to prevent data inconsistency in units of words.

- When reading the status using the BMOV/FROM instruction, specify an even number for the read size. Or, use the DMOV/DFROM instruction to read in double-word units.
- Specify an even number for the start address.

Details of buffer memory addresses (message communication G4496 to G16943 or G29231)

Message communication execution request flag

■Execution request flag (Un\G4496 to Un\G4623)

In message communication, this signal is used to request and check the execution of communication.

Information about the execution request, acceptance of the execution request, and execution completion for each connection is stored. The connections are stored in the order of 1 to 128 from the beginning.

R: Read, W: Write

Address	bit	Signal name	Description	R/W
Un\G4496 to Un\G4623	b0	Execution request	Requests execution to transmit the request command over message communications. • On: Requested • Off: Not requested	R/W
	b1	Execution request acceptance	The acceptance status of the message communication execution request is stored. • On: Accepted • Off: Not accepted	R
	b2	Execution completion	The execution status of the message communication is stored. • On: Completed • Off: Not completed	R

Timing chart

- When a message communication request is executed (when the trigger specification is "Application Trigger")

For the timing chart when executing a message communication request (when the trigger specification is "Application Trigger"), refer to the following.

 Page 70 Timing chart

- When a message communication request is executed (when the trigger specification is "Cyclic")

For the timing chart when executing a message communication request (when the trigger specification is "Cyclic"), refer to the following.

 Page 70 Timing chart

Message communication status

In message communication, this signal is used to check the communication status.

■Message communication reserved node (Un\G4640 to Un\G4647)

The setting status of the reserved node of connection numbers 1 to 128 is stored.

- On: Reserved node
- Off: Not set as reserved node

The following table lists the assignment of each area in the message communication status. The value of each bit indicates the connection number.

Message communication reserved node	Bit															
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G4640	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G4641	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G4642	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G4643	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G4644	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G4645	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G4646	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G4647	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113

Message communication request/response area

In message communication, this signal is used to store communication requests and responses.

■Message communication area (1st) (Un\G4656 to Un\G4847)

The communication request and response of message communication for connection number 1 are stored.

Address	Name	Description
Un\G4656 to Un\G4815	Request area	Stores the message communication request command. For details, refer to  Page 249 Message communication request area.
Un\G4816 to Un\G4847	Response area	Stores the message communication response command. For details, refer to  Page 250 Message communication response area.

■Message communication area (2nd to 64th/128th) (Un\G4848 to Un\G16943/29231)

The communication request and response of message communication for connections numbers 2 to 64/128 are stored.

Address	Name	Description
Un\G4848 to Un\G16943/29231	Request area/response area	Stores the message communication request/response command. For details, refer to  Page 249 Message communication request area.

The number of areas and addresses used for the buffer memory addresses of the message communication area differ depending on whether the module parameter "Maximum number of connections" is set to 64 or 128 connections.

	64 connection settings	128 connection settings
'Message communication area(1st)' (Un\G4656)	-----	-----
'Message communication area (64th)' (Un\G16943)	-----	-----
'Message communication area (128th)' (Un\G29231)	-----	-----

Message communication area (1st to 64th)

Message communication area (1st to 64th)

Message communication area (65th to 128th)

The details of the message communication area (2nd to 64th) are the same as the first one. When the nth area is used, each address value is calculated by adding $192 \times (\text{nth area} - 1)$ to the first address value. The message communication request/response area is used when the connection number communicates as a message communication client. When the connection number is used for communication that does not use the message communication request/response area, such as cyclic communication, the initial values are stored in each buffer memory. (Excluding "Communication type specification")

■Message communication request area

The following table lists the addresses of connection number 1.

○: Set, —: Do not set

Address	Item		Class3	UCMM	Description
Un\G4656	Communication type specification		—	○	Specify the communication method. • 0000H: UCMM communications not available • 0001H: UCMM communications • 0002H: Class3 communications
Un\G4657	Communication method specification		—	○	Specify the communication method. • 0001H: Instance communications • 0002H: Tag communications
Un\G4658	Service		—	○	<p>■For instance communications</p> <p>Specify the service code of the EtherNet/IP instance communications.</p> <ul style="list-style-type: none"> Lower 8 bits: Service code (0H to FFH) <p>Refer to the manual of each EtherNet/IP device for service codes except for the following.</p> <ul style="list-style-type: none"> 000EH (Get_Attribute_Single): Obtains the setting value of the specified Attribute. 0010H (Set_Attribute_Single): Sets the value for the specified attribute. <p>■For tag communications</p> <p>Select the tag communication type.</p> <ul style="list-style-type: none"> 124CH: Class3/UCMM Read Originator 124DH: Class3/UCMM Write Originator
Un\G4659 onwards Un\G4660	Target IP address		—	○	<p>Specify the IP address of the EtherNet/IP device to which the request data is transmitted during message communications.</p> <ul style="list-style-type: none"> Range: 0.0.0.1 to 223.255.255.254 <p>Specify the IP address from the first octet to the 4th octet as follows.</p> <ul style="list-style-type: none"> Lower byte of the first word: Fourth octet Upper byte of the first word: Third octet Lower byte of the second word: Second octet Upper byte of the second word: First octet
Un\G4661	RPI		○	○	<p>Set Requested Packet Interval.</p> <p>■Valid range: 00C8H to EA60H (200 to 60000ms)</p> <ul style="list-style-type: none"> Class3 communication: Operation is performed with the setting value. UCMM communication: When the trigger specification is set to Cyclic, operation is performed with the setting value. When the trigger is Application Trigger, the setting value is not reflected. <p>■Outside the valid range above</p> <ul style="list-style-type: none"> Class3 communication: Operation is performed with the parameter setting or the previous setting value. UCMM communication: When the trigger specification is set to Cyclic, a response error occurs. When the trigger is Application Trigger, the setting value is not reflected.
Un\G4662	TimeOutMultiplier		—	—	<p>Set TimeOutMultiplier during Class3 communications.</p> <ul style="list-style-type: none"> 0000H: ×4 0001H: ×8 0002H: ×16 0003H: ×32 0004H: ×64 0005H: ×128 0006H: ×256 0007H: ×512
Un\G4663	Trigger Type		—	○	<p>Set a transmission trigger.</p> <ul style="list-style-type: none"> 0000H: Application Trigger 0010H: Cyclic
Un\G4664	Path Segment specification	Segment Size	—	○	<p>Specify the size of the Path Segment.</p> <p>Unit: Word</p> <p>Range: 0 to 1</p> <ul style="list-style-type: none"> 0: Do not use Path Segment. 1: Use a one-word Path Segment. 2 or more: Not supported
Un\G4665 onwards Un\G4668		Path Segment	—	○	<p>Specify the Path Segment data to be assigned when connecting.</p> <p>This area is valid when the Path Segment specification (Segment Size) is set to a value other than 0.</p> <p>If Segment Size is 1, set the following values.</p> <ul style="list-style-type: none"> 0th to 3rd bit: Port number (1 to 14) 8th to 15th bit: Link address (slot number)

Address	Item	Class3	UCMM	Description
Un\G4669	Data Type	—	○	<p>■For instance communications Not used</p> <p>■For tag communications Set a data type for the request data.</p> <ul style="list-style-type: none"> • 00C3H: INT (signed 16-bit data) • 00C4H: DINT (signed 32-bit data)
Un\G4670	Class	—	○	<p>■For instance communications Refer to the manuals of the transmission destination EtherNet/IP device.</p>
Un\G4671	Instance	—	○	<p>■For instance communications Refer to the manuals of the transmission destination EtherNet/IP device.</p>
Un\G4672	Attribute	—	○	<p>■For instance communications Refer to the manuals of the transmission destination EtherNet/IP device.</p>
Un\G4673 onwards Un\G4800	Tag Name	—	○	<p>■For tag communications Set the tag name of the destination.</p> <ul style="list-style-type: none"> • Minimum number of characters: 1 ASCII code character • Maximum number of characters: 255 ASCII code characters <p>For details on the characters that can be used in tag names, refer to  Page 34 Instance ID and tag name.</p>

*1 The value set in the parameter is stored when the module starts. The items marked with "—" except for the communication method are not reflected even if the setting is changed.

*2 If UCMM communications are set for the communication method for the area set for Class3 in the parameter, a response error occurs.

- Path Segment specification

Point

When specifying a path segment, port segment can be specified.

Set Port Segment when accessing a device with tag data on the CPU module side via an EtherNet/IP device.

Precautions

- The Path Segment specification usually does not need to be changed from the default value. Specify Path Segment for devices that require the Connection Path specification.

*1 When the external device is the FX5-EIP or the FX5-ENET/IP, specify "Default (0)". For the Connection Path specification, refer to the EtherNet/IP specifications.

- Set the Path Segment specification according to the specifications of the external device. If a Path Segment that is not supported by the external device is specified, a response error may be received.

■Message communication response area

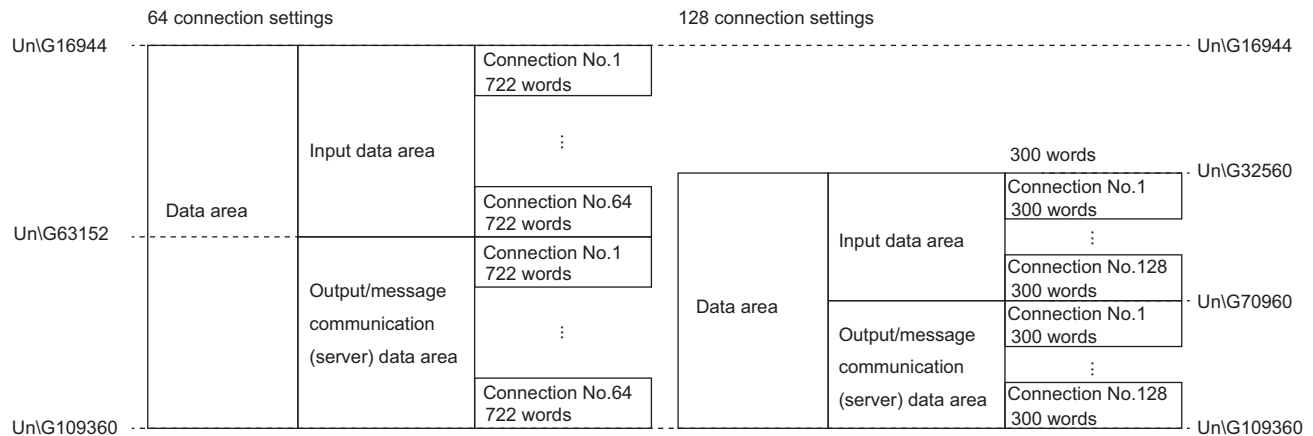
○: Set, —: Do not set

Address	Item	Class3	UCMM	Description
Un\G4816	Result storage area	—	—	<p>The request area processing result is stored.</p> <ul style="list-style-type: none"> • 0: Completed successfully • Other than 0: Completed with an error (error code) <p>For details on error codes, refer to  Page 192 List of Error Codes.</p>
Un\G4817 onwards Un\G4818	CIP response code	—	—	<p>The request area processing result is stored with a CIP response code.</p>
Un\G4819	Data Type	—	—	<p>The request area processing result is stored.</p> <ul style="list-style-type: none"> • When the communication method is instance communications: This area is not used. • When the communication method is tag communication and the Service is Class3 Read Originator: The response data type from the transmitting EtherNet/IP device is stored. • When the communication method is tag communication and the Service is Class3 Write Originator: The request area value is stored.
Un\G4820	Class	—	—	<p>Refer to the manuals of the response command transmission source EtherNet/IP device and the EtherNet/IP specifications.</p>
Un\G4821	Instance	—	—	<p>Refer to the manuals of the response command transmission source EtherNet/IP device and the EtherNet/IP specifications.</p>
Un\G4822	Attribute	—	—	<p>Refer to the manuals of the response command transmission source EtherNet/IP device and the EtherNet/IP specifications.</p>
Un\G4823 onwards Un\G4824	Execution completion count	—	—	<p>The number of execution completions of the message communication is stored.</p>

Details of buffer memory addresses (data area G16944 to G109359 or G32560 to G109359)

Data such as the target of Read/Write in cyclic communication/message communication is stored.

The data area is the same for all communication modes: cyclic communication, message communication (client function), message communication (server function) tag communication. For the relationship among the data area, data size, and I/O data buffer memory address, refer to  Page 124 Buffer memory settings. The buffer memory location and size of the data area differ depending on "Maximum Number of Connections Setting".



Input data area

The input data for each connection is stored.

■ Input data area (Un\G16944 to Un\G63151 or Un\G32560 to Un\G70959)

For 64 connections, connections are stored in the order of connection numbers 1 to 64 from the beginning, with one connection being fixed at 722 words.

For 128 connections, connections are stored in the order of connection numbers 1 to 128 from the beginning, with one connection being fixed at 300 words.

Item	Description	
During cyclic communication	The data received by the FX5-EIP from EtherNet/IP devices during cyclic communication is stored.	
During message communication (client function)	When the communication method is instance communications	The response data from the EtherNet/IP device that transmitted the response command is stored. However, it is not used for a service that sets values for the transmission destination device. For details, refer to the manuals of the transmission destination EtherNet/IP device.
	When the communication method is tag communication	<ul style="list-style-type: none"> When the Service is Class3/UCMM Read Originator, the response data from the transmission destination EtherNet/IP device is stored. When the Service is Class3/UCMM Write Originator, it is not used.
During message communication (server function)	Not used	

Output/message communication (server) data area

Set the output data for each connection or the tag data for message communication (server).

■Output/message communication (server) data area (Un\G63152 to Un\G109359 or Un\G70960 to Un\G109359)

For 64 connections, connections are stored in the order of connection numbers 1 to 64 from the beginning, with one connection being fixed at 722 words.

For 128 connections, connections are stored in the order of connection numbers 1 to 128 from the beginning, with one connection being fixed at 300 words.

Item	Description	
During cyclic communication	Set the data to be transmitted from the FX5-EIP to EtherNet/IP devices via cyclic communication.	
During message communication (client function)	When the communication method is instance communications	Set the necessary value for each service. However, it is not used for a service that obtains values from the transmission destination device. <ul style="list-style-type: none"> • Get_Attribute_Single: No setting • Set_Attribute_Single: Value set for the specified attribute For details other than those listed above, refer to the manuals of the transmission destination EtherNet/IP device.
	When the communication method is tag communication	<ul style="list-style-type: none"> • When the Service is Class3/UCMM Write Originator, specify the data to be written in the destination tag. • When the Service is Class3/UCMM Read Originator, it is not used.
During message communication (server function)	When the communication method is instance communications	Not used
	When the communication method is tag communication	This tag data that is the target of Read/Write in Class3/UCMM tag communication is stored. The "Input data area" is not used during message communication (server function) tag communication, and the "Output/message communication (server) data area" is used for both Read and Write requests to tags.

Details of buffer memory addresses (module information Un\G110116)

Number of consumed connections

■For Class1/Class3 communication (Un\G110116)

The current number of consumed connections is displayed. The number of consumed connections is the total number of the following connections. (Maximum: 128)

- Connections^{*1} set in "EtherNet/IP Configuration" as the Class1 communications (instance/tag) originator
- Connections^{*1} set in "EtherNet/IP Configuration" as the Class3 communications (instance/tag) client
- Active connections^{*2*3} as a Class1 communications (instance/tag) target
- Connections^{*3*4} that are communicating with another EtherNet/IP device as a Class3 communications (instance/tag) server

Connection will not be possible if the maximum value of 128 is exceeded. If an originator device that is actively communicating as a target for Class1 communications (instance/tag) has its communication interrupted due to a cable break or communication error, the count is reduced.

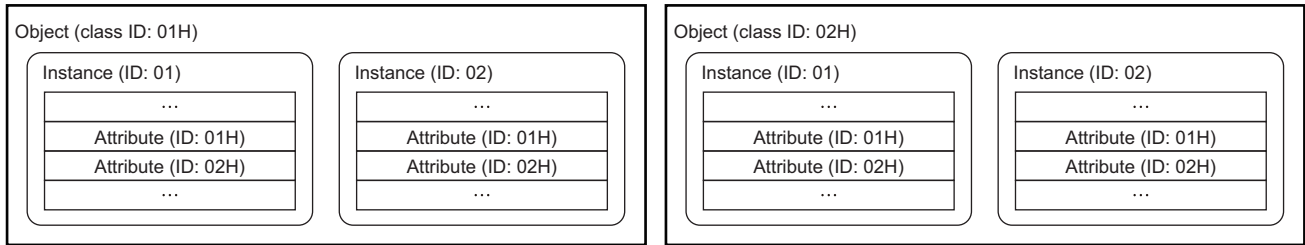
- *1 Even if communication has not started, these connections are counted as consumed connections.
- *2 When a request from an originator is received, it is counted as a consumed connection once communication starts.
If multiple originators connect to connections set as targets using multicast, the number of connected originators will be added to the number of consumed connections.
- *3 The connections are not added by only setting the Class1 communication (instance/tag) targets in "EtherNet/IP Configuration" or setting the tag for Class3/UCMM tag communication. As a condition for adding to the number of consumed connections, the connection must be present from receiving the connection establishment request from the originator/client until the connection is released.
- *4 The Class3 instance communications server function allows it to operate as a server if requested by a client and accepts connection establishment requests even if there are no settings in "EtherNet/IP Configuration". In such cases, these connections are added to the number of connections.

Appendix 5 Details of Message Communication Support Command

The section describes the commands used during Class3 instance communications and UCMM instance communications. EtherNet/IP devices are provided with objects (functions or data expressed abstractly) and services (operations or functions to be executed by requests).

Explanation of terms	
Term	Explanation
Object	Each object is managed with its class ID in an EtherNet/IP device. An object has one or more instances.
Instance	Each instance is managed with its instance ID in an object. An instance has one or more pieces of information called attributes inside. In addition, an instance has one or more services that can be executed and each service can be used with its service code. Available services are determined by the instance.
Attribute	Each attribute is managed with its attribute ID in an instance.

The following shows the relationships among objects, instances, and attributes.



Service execution

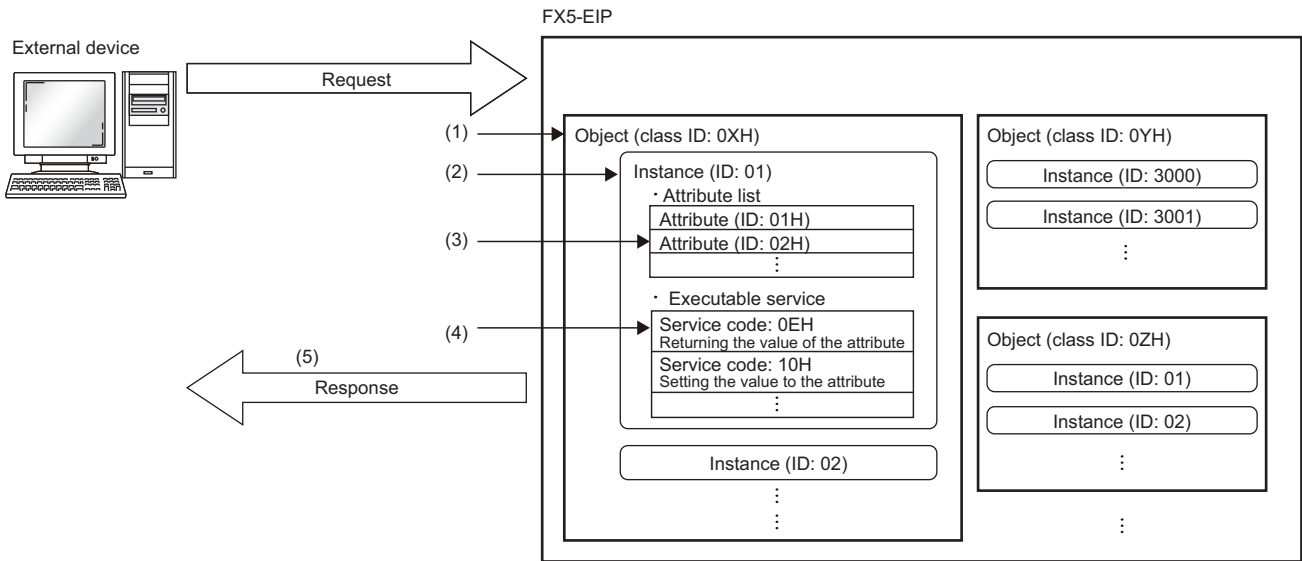
To execute a service, specify a target by using a class ID, instance ID, and attribute ID. (In some services, an attribute ID does not need to be specified.)

The following shows a flow of service execution by using message communication support commands.

Ex.

When the following service (Get_Attribute_Single) is specified and a request for reading an attribute is transmitted from the external device to the FX5-EIP

Item	Description
Class ID	0XH
Instance ID	01H
Attribute ID	02H
Service code	0EH



- (1) Access the class ID 0XH.
- (2) Access the instance ID 01H.
- (3) Specify the attribute ID 02H.
- (4) Execute the service code 0EH.
- (5) The value of the attribute specified in (3) is returned.

Object list

The following table lists the objects that can be used with message communication support commands.

Object name	Description	Reference
Identity	Holds information such as the identification information of the FX5-EIP.	Page 257
Message Router	Holds information such as the class information of the FX5-EIP.	Page 259
Connection Manager	Used when establishing a connection with the FX5-EIP.	Page 260
TCP/IP Interface	Holds the settings and status related to TCP/IP.	Page 261
Ethernet Link	Holds the settings and status related to Ethernet communication.	Page 263

Command explanations

The object items are shown below.

Item	Description
Class attribute	Data possessed by the class of an object. ^{*1} This attribute is shared by all objects in the same 'class'. It is specified by setting the instance ID to '0'.
Class service	Service performed by specifying a class. ^{*1}
Instance attribute	Data possessed by the instance of an object. ^{*2}
Instance service	Service performed by specifying an instance. ^{*2}

*1 A class possesses the basic information such as the revision and instance of the object.

*2 An instance possesses the information of each object such as its functions and data.

■Class attribute/instance attribute items

The class attribute/instance attribute items are shown below.

- Access

This item indicates whether reading and writing using instance services are allowed.

Item	Description
Get	Reading is possible with services such as Get_Attribute_Single.
Set	Writing is possible with services such as Set_Attribute_Single.

- Data type

Indicates the class/instance data type. The data types available in the FX5-EIP (determined by the CIP specifications) are shown below.

Item	Description	Data size	Range
BOOL	Bit data	1 byte	0: Off (False) 1: On (True)
SINT	Signed 8-bit data	1 byte	-128 to +127
INT	Signed 16-bit data	2 bytes	-32768 to +32767
DINT	Signed 32-bit data	4 bytes	-2147483648 to +2147483647
USINT	Unsigned 8-bit data	1 byte	0 to 255
UINT	Unsigned 16-bit data	2 bytes	0 to 65535
UDINT	Unsigned 32-bit data	4 bytes	0 to 4294967295
ULINT	Unsigned 64-bit data	8 bytes	0 to 18446744073709551615
REAL	Single-precision floating point real number	4 bytes	$E \pm 1.17549435 - 38$ to $E \pm 3.40282347 + 38$
LREAL	Double-precision floating point real number	8 bytes	$E \pm 2.2250738585072014 - 308$ to $E \pm 1.7976931348623157 + 308$
STRING	Character string data	Depends on the number of characters	—
SHORT_STRING	Character string size + character string data ^{*1}	Depends on the number of characters Number of characters + 1 byte	—
BYTE	Bit string (8 bits)	1 byte	—
WORD	Bit string (16 bits)	2 bytes	—
DWORD	Bit string (32 bits)	4 bytes	—
Padded EPATH	CIP path segment	4 bytes	—

*1 The size of the obtained character string is set to the beginning of a character string as USINT-type one byte.

- Setting value (Set)/stored value (Get)

The content indicated by each value varies depending on the content of access.

Item	Description
"Get" is available	The setting value (Set)/stored value (Get) can be read from the FX5-EIP.
"Set" is available	The setting value (Set)/stored value (Get) can be set on the FX5-EIP.

Identity

Object name	Class ID
Identity	01H

Class attribute (instance ID: 00H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Revision	UINT	Object revision	0002H
2	○	×	Max Instance	UINT	Maximum instance ID	0001H
3	○	×	Number of instances	UINT	Number of created instances	0001H

Class service

Service code	Service	Remarks
01H	Get_Attributes_All	When this service is executed for the class attributes, the following values are returned. <ul style="list-style-type: none"> Attribute ID1: Value of attribute ID1 Attribute ID2: Value of attribute ID2 Attribute ID6: 0000H Attribute ID7: 0000H
0EH	Get_Attribute_Single	—

Instance attribute (instance ID: 01H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Vendor Id	UINT	Vendor ID number	00A1H
2	○	×	Device Type	UINT	Device type	000CH
3	○	×	Product Code	UINT	Product ID number	000DH
4	○	×	Revision	Major Revision	Major revision	01H
				Minor Revision	Minor revision	01H
5	○	×	Status	WORD	Product status	Page 258
6	○	×	Serial Number	UDINT	Serial number	Varies depending on modules.
7	○	×	Product Name	SHORT_STRING	Product name	"FX5-EIP"*1

*1 Since the data type is SHORT_STRING, the number of characters in the product name is added to the beginning of a character string.

A

■Details of product status

Bit	Description	Value
0	Owned	The word "connection" described below refers to the Exclusive Owner connection. (The bit is not changed by an Input Only or Listen Only connection.) <ul style="list-style-type: none"> • 0: EtherNet/IP communications are not connected as the target device. • 1: At least one connection of EtherNet/IP communications is connected as the target device.
1	Reserved	Fixed to 0
2	Configured	Fixed to 1
3	Reserved	Fixed to 0
4 to 7	Extended Device Status	The word "connection" described below refers to the Exclusive Owner connection. (The bit is not changed by an Input Only or Listen Only connection.) <ul style="list-style-type: none"> • 0010 (2H): Error occurring on one or more connections • 0011 (3H): No connections established • 0101 (5H): Major Fault occurring (bit 10 or bit 11 turned on) • 0110 (6H): One or more connections performing normal communications in RUN mode • 0111 (7H): One or more connections all performing communications in IDLE mode
8	Minor Recoverable Fault	<ul style="list-style-type: none"> • 0: No error • 1: Minor error occurring
9	Minor Unrecoverable Fault	Fixed to 0
10	Major Recoverable Fault	<ul style="list-style-type: none"> • 0: No error • 1: Moderate error occurring
11	Major Unrecoverable Fault	<ul style="list-style-type: none"> • 0: No error • 1: Major error occurring
12 to 15	Extended Device Status 2	Fixed to 0

Instance service

Service code	Service	
01H	Get_Attributes_All	—
05H	Reset	When this service is received while cyclic communication is stopped, a normal response is returned and the following operation is performed. <ul style="list-style-type: none"> • Stop of EtherNet/IP communications • LED test (same as at module startup) • Startup of EtherNet/IP communications When this service is received during cyclic communication, an error response is returned.
0EH	Get_Attribute_Single	—

Message Router

Object name	Class ID
Message Router	02H

Class attribute (instance ID: 00H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Revision	UINT	Object revision	0001H
2	○	×	Max Instance	UINT	Maximum instance ID	0001H
3	○	×	Number of instances	UINT	Number of created instances	0001H
6	○	×	Maximum ID Number Class Attributes	UINT	Attribute ID number of class attribute	0007H
7	○	×	Maximum ID Number Instance Attributes	UINT	Attribute ID number of instance attribute	0002H

Class service

Service code	Service	Remarks
0EH	Get_Attribute_Single	—

Instance attribute (instance ID: 01H)

Attribute ID	Access (○: Available, ×: Not available)		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Object List	Number	UINT	Number of supported classes in a class array
				Classes	USINT array [8]	List of supported class codes (class IDs) • 0: 0001H • 1: 0002H • 2: 0004H • 3: 0006H • 4: 00F5H • 5: 00F6H • 6: 0109H • 7: 010AH
2	○	×	NumberAvailable	UINT	Maximum number of connections supported	0080H

Instance service

Service code	Service
0EH	Get_Attribute_Single

Connection Manager

Object name	Class ID
Connection Manager	06H

Class attribute (instance ID: 00H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Revision	UINT	Object revision	0001H
2	○	×	Max Instance	UINT	Maximum instance ID	0001H
3	○	×	Number of instances	UINT	Number of created instances	0001H

Class service

Service code	Service	Remarks
01H	Get_Attributes_All	00H is stored in the fourth to seventh bytes.
0EH	Get_Attribute_Single	—

Instance attribute (instance ID: 01H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Open Requests	UINT	Number of received Forward_Open services	Value on the left
2	○	×	Open Format Rejects	UINT	Number of Forward_Open services rejected due to format incompatibility	Value on the left
3	○	×	Open Resource Rejects	UINT	Number of Forward_Open services rejected due to insufficient resources	Value on the left
4	○	×	Open Other Rejects	UINT	Number of Forward_Open services rejected due to reasons other than format incompatibility and insufficient resources	Value on the left
5	○	×	Close Requests	UINT	Number of received Forward_Close services	Value on the left
6	○	×	Close Format Requests	UINT	Number of Forward_Close services rejected due to format incompatibility	Value on the left
7	○	×	Close Other Requests	UINT	Number of Forward_Close services rejected due to reasons other than format incompatibility	Value on the left
8	○	×	Connection Timeouts	UINT	Total number of connection timeouts that occurred in connections controlled by the Connection Manager	Value on the left

Instance service

Service code	Service
01H	Get_Attributes_All
0EH	Get_Attribute_Single
4EH	Forward_Close
54H	Forward_Open
5BH	Large_Forward_Open

TCP/IP Interface

Object name	Class ID
TCP/IP Interface	F5H

Class attribute (instance ID: 00H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Revision	UINT	Object revision	0004H
2	○	×	Max Instance	UINT	Maximum instance ID	0001H
3	○	×	Number of instances	UINT	Number of created instances	0001H
6	○	×	Maximum ID Number Class Attributes	UINT	Attribute ID number of class attribute	0007H
7	○	×	Maximum ID Number Instance Attributes	UINT	Attribute ID number of instance attribute	000DH

Class service

Service code	Service	Remarks
01H	Get_Attributes_All	—
0EH	Get_Attribute_Single	—

Instance attribute (instance ID: 01H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Status	DWORD	Interface status	Page 262
2	○	×	Configuration Capability	DWORD	Interface capability flag	Page 262
3	○	×	Configuration Control	DWORD	Interface control flag	Page 262
4	○	×	Physical Link Object	Path size	Path size of physical link object	0002H
				Path	Padded EPATH Logical segment that identifies the physical link object	<ul style="list-style-type: none"> • 0: 20H • 1: F6H • 2: 24H • 3: 01H
5	○	×	Interface Configuration	IP Address	UDINT	IP address of the device
				Network Mask	UDINT	Network mask of the device
				Gateway Address	UDINT	Default gateway address
				Name Server	UDINT	Primary name server
				Name Server 2	UDINT	Secondary name server
				Domain Name	STRING	Default domain name
6	○	×	Host Name	STRING	Host name	" " (null character)
13	○	○ ^{*1}	Encapsulation Inactivity Timeout	UINT	Sets the time until the TCP connection or DTLS session is closed (unit: seconds).	<ul style="list-style-type: none"> • 1 to 3600 0 is invalid. (Default: 120)

*1 The setting data is saved to non-volatile memory.

■Details of interface status

Bit	Description	Value
0 to 3	Interface Configuration Status	Fixed to 2 (setting of the IP address acquired from the parameter settings)
4	Mcast Pending	Fixed to 0 (TTL Value and Mcast Config attribute settings unsupported)
5	Interface Configuration Pending	Fixed to 0 (Interface Configuration attribute setting unsupported)
6	AcdStatus	Fixed to 0 (address duplication detection setting unsupported)
7	AcdFault	Fixed to 0 (address duplication detection setting unsupported)
8	IANA Port Admin Change Pending	Fixed to 0 (IANA Port Admin attribute setting unsupported)
9	IANA Protocol Admin Change Pending	Fixed to 0 (IANA Protocol Admin attribute setting unsupported)
10 to 31	Reserved	Fixed to 0

■Details of interface capability flag

Bit	Description	Value
0	BOOTP Client	Fixed to 0 (BOOTP setting unsupported)
1	DNS Client	Fixed to 0 (name resolution setting with DNS unsupported)
2	DHCP Client	Fixed to 0 (IP address setting with DHCP unsupported)
3	DHCP-DNS Update	Fixed to 0 (host name sending setting with DHCP requests unsupported)
4	Configuration Settable	Fixed to 0 (Interface Configuration attribute setting unsupported)
5	Hardware Configurable	Fixed to 1 (support for IP addresses set with parameters)
6	Interface Configuration Change Requires Reset	Fixed to 0 (Interface Configuration attribute setting unsupported)
7	AcdCapable	Fixed to 0 (address duplication detection setting unsupported)
8 to 31	Reserved	Fixed to 0

■Details of interface control flag

Bit	Description	Value
0 to 3	Configuration Method	Fixed to 0 (use of IP addresses set with parameters)
4	DNS Enable	Fixed to 0 (name resolution setting with DNS unsupported)
5 to 31	Reserved	Fixed to 0

Instance service

Service code	Service
01H	Get_Attributes_All
0EH	Get_Attribute_Single
10H	Set_Attribute_Single

Ethernet Link

Object name	Class ID
Ethernet Link	F6H

Class attribute (instance ID: 00H)

○: Available, ×: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Revision	UINT	Object revision	0004H
2	○	×	Max Instance	UINT	Maximum instance ID	0001H
3	○	×	Number of instances	UINT	Number of created instances	0001H

Class service

Service code	Service	Remarks
01H	Get_Attributes_All	—
0EH	Get_Attribute_Single	—

Instance attribute (instance ID: 01H)

○: Available, —: Not available

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
1	○	×	Interface Speed	UDINT	Communication speed of the current interface in use (unit: Mbps)	<ul style="list-style-type: none"> • 10 • 100 • 1000
2	○	×	Interface Flags	DWORD	Interface status flag	📄 Page 265
3	○	×	Physical Address	USINT array [6]	MAC layer address	Varies depending on modules.
4	○*2	×	Interface Counters	UDINT	Number of octets received through the interface	Value on the left
				UDINT	Number of unicast packets received through the interface	Value on the left
				UDINT	Number of non-unicast packets received through the interface	Value on the left
				UDINT	Number of receive packets received through the interface but discarded	00000000H
				UDINT	Number of receive packets including errors (number of packets not included in InDiscards)	00000000H
				UDINT	Number of receive packets including unknown protocols	Value on the left
				UDINT	Number of octets transmitted through the interface	Value on the left
				UDINT	Number of unicast packets transmitted through the interface	Value on the left
				UDINT	Number of non-unicast packets transmitted through the interface	Value on the left
				UDINT	Number of discarded transmission packets	00000000H
				UDINT	Number of transmission packets including errors	00000000H

A

Attribute ID	Access		Name			Data type	Description	Setting value (Set)/ stored value (Get)	
	Get	Set							
5	○ ^{*2}	×	Media Counters	Alignment Errors		UDINT	Number of receive frames with lengths that are not octet integers	Value on the left	
				FCS Errors		UDINT	Number of receive frames that do not pass the FCS check	Value on the left	
				Single Collisions		UDINT	Number of frames transmitted successfully with only one collision	Value on the left	
				Multiple Collisions		UDINT	Number of frames transmitted successfully with two or more collisions	Value on the left	
				SQE Test Errors		UDINT	Number of times SQE test error messages were created	00000000H	
				Deferred Transmissions		UDINT	Number of frames for which the first transmission test was delayed due to the medium being busy	Value on the left	
				Late Collisions		UDINT	Number of collisions detected in packet transmission after 512 bit time or later in packet transmission	Value on the left	
				Excessive Collisions		UDINT	Number of failed frames in transmission due to excessive collisions	Value on the left	
				MAC Transmit Errors		UDINT	Number of frames that failed to be transmitted due to internal MAC sublayer transmission errors	00000000H	
				Carrier Sense Errors		UDINT	Number of times the carrier sense condition was lost or was not asserted during attempts to transmit frames	00000000H	
				Frame Too Long		UDINT	Number of receive frames that exceeded the maximum allowable frame size	00000000H	
				MAC Receive Errors		UDINT	Number of frames that failed to be received through interface due to internal MAC sublayer receiving errors	00000000H	
6	○	○	Interface Control	Control Bits		WORD	Interface control bits	0001H	
				Forced Interface Speed		UINT	Forced interface operation speed	0000H	
7	○	×	Interface Type			USINT	Interface type	02H	
8	○	×	Interface State			USINT	Current interface status	01H	
9	○	○	Admin State			USINT	Current administration status	01H	
11	○	×	Interface Capability	Capability Bits		DWORD	Interface function other than Speed/Duplex	00000006H	
				Speed/Duplex Options	Speed/Duplex Array Count		USINT	Number of Speed/Duplex arrays	00H
					Speed/Duplex Array	Interface Speed	UINT	Speed at which the interface is forced to operate	—
						Interface Duplex Mode	USINT	Duplex mode of the interface ^{*1}	—

Attribute ID	Access		Name	Data type	Description	Setting value (Set)/ stored value (Get)
	Get	Set				
12	○ ^{*2}	×	HC Interface Counters	HCInOctets	ULINT	Number of octets received through the interface
				HCInUcastPkts	ULINT	Number of unicast packets received through the interface
				HCInMulticastPkts	ULINT	Number of multicast packets received through the interface
				HCInBroadcastPkts	ULINT	Number of broadcast packets received through the interface
				HCOctets	ULINT	Number of octets transmitted through the interface
				HCOUcastPkts	ULINT	Number of packets transmitted through the interface
				HCOMulticastPkts	ULINT	Number of multicast packets transmitted through the interface
				HCOBroadcastPkts	ULINT	Number of broadcast packets transmitted through the interface
13	○ ^{*2}	×	HC Media Counters	HCStatsAlignmentErrors	ULINT	64-bit version of Alignment Errors
				HCStatsFCSErrors	ULINT	64-bit version of FCS Errors
				HCStatsInternalMacTransmitErrors	ULINT	64-bit version of MAC Transmit Errors
				HCStatsFrameTooLong	ULINT	64-bit version of Frame Too Long
				HCStatsInternalMacReceiveErrors	ULINT	64-bit version of MAC Receive Errors
				HCStatsSymbolErrors	ULINT	Number of illegal data symbols in the media when a valid carrier exists

*1 Arrays are displayed in combination with Interface Speed. This indicates the speed and Duplex mode supported by the module.

*2 Get_and_Clear can be used as well.

Interface status flag details

Bit	Item	Value
0	Link-up status	<ul style="list-style-type: none"> 0: Link-down 1: Link-up
1	Connection status (full-duplex/half-duplex)	<ul style="list-style-type: none"> 0: Half-duplex 1: Full-duplex
2 to 4	Auto-negotiation status	<ul style="list-style-type: none"> 0: Auto-negotiation being executed 1: Auto-negotiation failed and operation in progress with the default communication speed and method 2: Communication method detection failed, but communication speed detection succeeded 3: Auto-negotiation completed successfully 4: Auto-negotiation unexecuted
5	Necessity of restart after manual settings	Fixed to 0 (manual settings unsupported)
6	Local Hardware Fault detection status	Fixed to 0 (Local Hardware Faults not detected)
7 to 31	Fixed value	0

Instance service

Service code	Service
01H	Get_Attributes_All
0EH	Get_Attribute_Single
10H	Set_Attribute_Single
4CH	Get_and_Clear ^{*1}

*1 Clear after obtaining the value of the specified attribute. It is only available for attributes [4, 5, 12, 13].

Appendix 6 Processing Time

This section describes the data link processing time.

RPI (Requested Packet Interval)

The FX5-EIP transmits and receives data according to the RPI interval defined by the parameter settings in the 'EtherNet/IP Configuration' of GX Works3. The fastest RPI value is calculated by the following formula based on the number of connections and the PPS of the module.

Fastest value of RPI = $\frac{2 \times \text{Number of connections}}{\text{PPS}}$ (s)

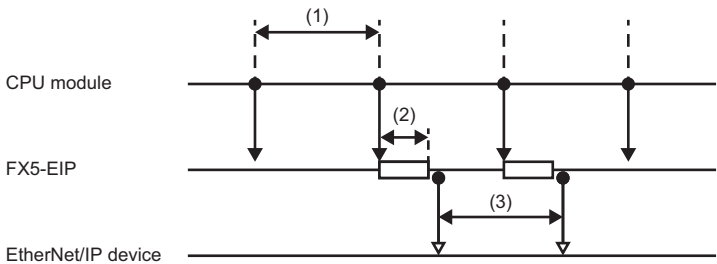
Transmission delay time

The following describes the formulas used to calculate the transmission delay time of EtherNet/IP communications. Note that the processing time may be prolonged depending on the load ratio of the network (degree of line congestion), the processing performance of the connected devices, and the system configuration.

Cyclic communication

■Transmission delay time

The concept of transmission delay time of transmitted data is shown below.



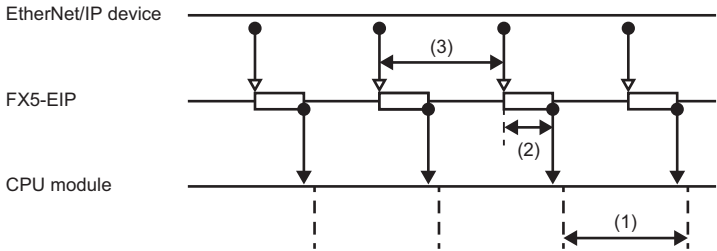
No.	Item name	Description
(1)	Sequence scan	Time required from setting the transmitted data in a program to refreshing the buffer memory on the FX5-EIP
(2)	Transmission delay time	Time required for transferring transmitted data from the buffer memory on the FX5-EIP to the transmission buffer (approximately 1ms for 32 connections and 64-byte data size)
(3)	RPI	RPI setting value (transmission interval time)

The transmission delay time of transmitted data is calculated by the following formula.

Item name	Transmission delay time
Normal value	$\text{RPI} \div 2$
Maximum value	$(1) + (2) + (3)$

■Receive delay time

The concept of delay time of receive data is shown below.



No.	Item name	Description
(1)	Sequence scan	Time required for refreshing the receive data from the buffer memory on the FX5-EIP to a program
(2)	Receive delay time	Time required for transferring receive data from the receive buffer to the buffer memory on the FX5-EIP (approximately 1ms for 32 connections and 64-byte data size)
(3)	RPI	RPI setting value (transmission interval time)

The transmission delay time of receive data is calculated by the following formula.

Item name	Transmission delay time
Maximum value	(1) + (2) + (3)

Appendix 7 Port Number

This section describes the port numbers used by the EtherNet/IP communication functions of the FX5-EIP.

Server side port number

Port number		Application
Decimal	Hexadecimal	
2222	8AEH	EtherNet/IP communications (cyclic communications)
44818	AF12H	EtherNet/IP communications (message communications and cyclic communication connection start (FwdOpen))

Client side port number

Port number		Application
Decimal	Hexadecimal	
49512 to 61440, 61442 to 65534	C168H to F000H, F002H to FFFE H	For system

Port numbers used for non-EtherNet/IP communication

Port number		Application
Decimal	Hexadecimal	
1 to 2221, 2223 to 5548, 5570 to 44817, 44819 to 49511	1H to 8ADH, 8AFH to 15ACH, 15C2H to AF11H, AF13H to C167H	TCP/UDP ports used in the external device connection configuration <ul style="list-style-type: none">• MELSOFT connection• SLMP communication (server function)• Socket communication
5549 to 5551, 5553, 5556 to 5560, 5562 to 5569	15ADH to 15AFH, 15B1, 15B4H to 15B8H, 15BAH to 15C1H	For system
5552	15B0H	Auto-open UDP port
5554	15B1H	MELSOFT transmission port (TCP/IP)
5555	15B2H	MELSOFT transmission port (UDP/IP)
5561	15B9H	For system
61441	F001H	For system
65535	FFFFH	Cannot be used

Appendix 8 Software Licenses and Copyrights

This section describes the licenses and copyrights of software used in this product.

MD5 Message-Digest Algorithm

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MEMO

REVISIONS

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

Revision date	*Manual number	Description
October 2025	SH(NA)-082709ENG-A	First edition
January 2026	SH(NA)-082709ENG-B	■Added or modified parts Section 7.4, Chapter 8, Appendix 4, 5

Japanese manual number: SH-082708-B

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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.
- (3) Mitsubishi shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INFORMATION AND SERVICES

For further information and services, please contact your local Mitsubishi Electric sales office or representative.
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MITSUBISHI ELECTRIC Factory Automation Global Website

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MODEL: FX5-U-EIP-E

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