MITSUBISHI ELECTRIC

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, $Cl_2$, $H_2S$, $SO_2$ or $NO_2$), 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℃ 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 2mm$^2$ 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 palettes. 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.

# CONTENTS

# RELEVANT MANUALS

| Manual name <manual number> | Description |
|---|---|
| MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware) <SH-082452ENG> | Hardware of the CPU module, including performance specifications, wiring, installation, and maintenance |
| MELSEC iQ-F FX5 User's Manual (Application) <JY997D55401> | Basic knowledge required for program design, functions of the CPU module, devices/labels, and parameters |
| 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 Ethernet module and those built into the CPU 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.

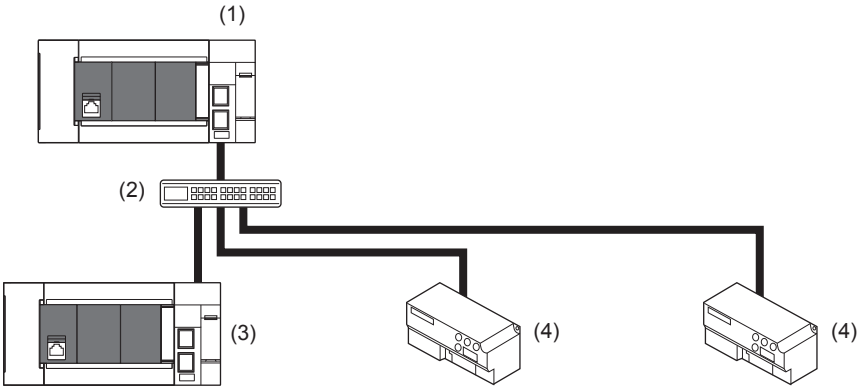
| Generic term/abbreviation | Description |
|---|---|
| CIP | An abbreviation for Common Industrial Protocol.<br>One of the open protocols of ODVA, a specialized application protocol for EtherNet/IP, DeviceNet and ControlNet. |
| EtherNet/IP device | A generic term for the devices, personal computers, 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.<br>It is the communication cycle determined by the originator during communications between EtherNet/IP devices. |
| TCP | An abbreviation for Transmission Control Protocol.<br>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.<br>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 general-purpose Ethernet.

## EtherNet/IP communication

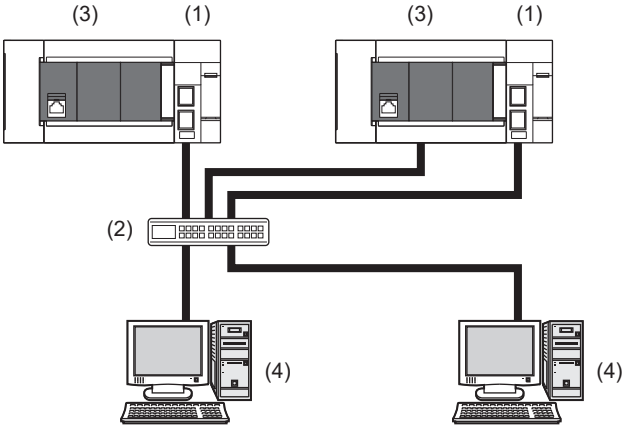
The module can communicate seamlessly with an EtherNet/IP network by using the communication protocol CIP.
The FX5-EIP functions as a scanner (originator/client) or an adapter (target/server) of the EtherNet/IP network.




(1) FX5-EIP (scanner)
(2) Hub
(3) FX5-EIP (adapter)
(4) EtherNet/IP device (scanner/adapter)

## General-purpose Ethernet communication

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




(1) FX5-EIP
(2) Hub
(3) CPU module
(4) External device (personal computer)

# MEMO

# 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 specification, refer to the following manual.

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

| Item | Specifications | |
|---|---|---|
| Dielectric withstand voltage | 500VAC for 1 minute | Between all terminals and ground terminal |
| Insulation resistance | 10MΩ 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 | | • Instance communications<br>• Tag communications |
| | | Number of connections[*2] | | • 64 connections<br>• 128 connections |
| | | Communication data size[*2] | | • 64 connections: 1444 bytes (per connection)[*3]<br>• 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)<br>5000pps (at 600 bytes)<br>2000pps (at 1444 bytes) |
| | Class3 communications | Communication format | | • Instance communications<br>• Tag communications |
| | | Number of connections[*2] | | • Server: 32 connections (number of simultaneous executions)<br>• Client: 64 connections, 128 connections |
| | | Communication data size[*2] | | ■64 connections<br>Instance communications: 1404 bytes (per connection)<br>Tag communications: 496 bytes (per connection)<br>■128 connections<br>Instance communications: 600 bytes (per connection)<br>Tag communications: 496 bytes (per connection) |
| | | Connection type | | Point-to-point |
| | UCMM communications | Communication format | | • Instance communications<br>• Tag communications |
| | | Number of connections (number of simultaneous executions) | | • Server: 32 connections<br>• Client: 32 connections |
| | | Communication data size | | • Instance communications: 504 bytes (including headers)<br>• 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 |
|---|---|---|---|---|
| General-purpose 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]<br>(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 sent simultaneously. The period between sending a request and receiving a response is counted in UCMM communications.
If a request that exceeds the upper limit is sent, 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.

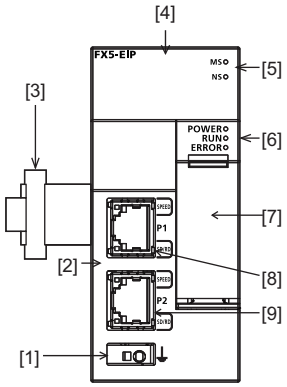
### Precautions

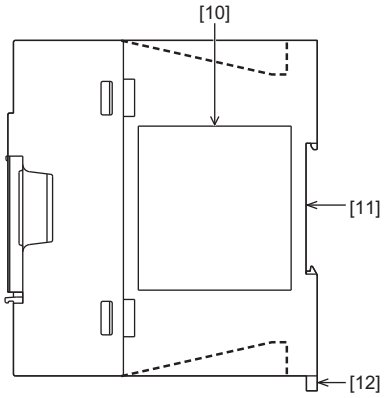
The operation of the following connections is not guaranteed. Check the operation before using the module.

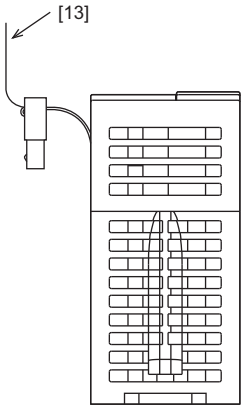
- Connection using Internet (general public line) (Internet-access service offered by an Internet service provider or a telecommunications carrier)
- Connection using firewall device(s)
- Connection using broadband router(s)
- Connection using wireless LAN

# 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 module 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) | A port 1 connector for EtherNet/IP network and general-purpose Ethernet network. Connect an Ethernet cable. |
| [9] | Modular jack for P2 (RJ-45) (with cap) | A port 2 connector for EtherNet/IP network and general-purpose 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 | They are 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.<br>■LED color: Green<br>• On: Data communication possible<br>• Flashing: No parameter setting<br>■LED color: Red<br>• On: Moderate error or major error<br>• Flashing: Minor error |
| NS | | Green, Red | Indicates the EtherNet/IP network status.<br>■LED color: Green<br>• On: Data communications being performed*1<br>• Flashing: Failed to establish connection<br>■LED color: Red<br>• On: IP address duplication detected<br>• Flashing: Connection time out |
| POWER | | Green | Indicates the power supply status.<br>• On: Power on<br>• Off: Power off or module failure |
| RUN | | Green | Indicates the operating status.<br>• On: Normal operation<br>• Off: Error |
| ERROR | | Red | Indicates the module error status.<br>• On: Minor error or major error<br>• Flashing: Moderate error or major error<br>• Off: Normal operation |
| P1, P2 | SPEED | Green | Indicates the transmission speeds of P1 and P2.<br>• On: Link-up (100Mbps)<br>• Off: Link-up (10Mbps) |
| | SD/RD | Green | Indicates the data sending/receiving status of P1 and P2.<br>• On, Flashing: Data being sent or received<br>• 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.*** Check the communication status

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

## General-purpose 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)

# MEMO

# 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.

**Point**

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 | This function establishes a connection and periodically performs data communications with EtherNet/IP devices. | ■Class1 instance communications<br>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.<br>■Class1 tag communications<br>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.<br>■Cyclic communication stop and restart<br>Stop or restart of cyclic communication is enabled individually for each connection with 'Cyclic communication pause specification' (Un\G1360 onwards). | ☞ Page 26 Cyclic Communication Function |
| Message communication function (client) | This function performs message communications using point-to-point between the client (message sending side) and the server (message receiving and processing side). | ■Class3 instance communications<br>Establishes a connection between the FX5-EIP and the EtherNet/IP device (server) to perform message communication.<br>■UCMM instance communications<br>Performs message communication without establishing a connection between the FX5-EIP and the EtherNet/IP device (server).<br>■Class3 tag communications<br>Establishes a connection between the FX5-EIP and the EtherNet/IP device (server), and uses message communication to read and write data to tags.<br>■UCMM tag communications<br>Uses message communication to read and write data to tags without establishing a connection between the FX5-EIP and the EtherNet/IP device (server). | ☞ Page 57 Message Communication Function (Client) |
| Message communication function (server) | This function executes the service specified by a command request sent by the client and returns a response. | ■Class3 instance communications<br>Establishes a connection between the FX5-EIP and the EtherNet/IP device (client), processes command requests received from the client, and sends response data.<br>■UCMM instance communications<br>Processes command requests received from the client and sends response data without establishing a connection between the FX5-EIP and the EtherNet/IP device (client).<br>■Class3 tag communications<br>Establishes a connection between the FX5-EIP and the EtherNet/IP device (client) to read and write data to the set tags.<br>■UCMM tag communications<br>Reads and writes data to the set tags without establishing a connection between the FX5-EIP and the EtherNet/IP device (client). | ☞ 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 on 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 | With this function, EtherNet/IP communications can be started without any program when the programmable controller is powered off and on. | ☞ Page 79 EtherNet/IP Communication Automatic Start Function |

## General-purpose Ethernet communication functions

For details on general-purpose 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 single Ethernet cable without using a hub. Communication is done 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) within 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 with a personal computer using GX Works3 within the same hub. Acquires IP address by selecting from search results list. | 📖MELSEC iQ-F FX5 User's Manual (Communication) |
| MELSOFT diagnosis function | Diagnoses the Ethernet port 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 PLC data from other 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 sent to EtherNet/IP devices for each connection. | ☞ Page 235 Assurance of input/ output data |

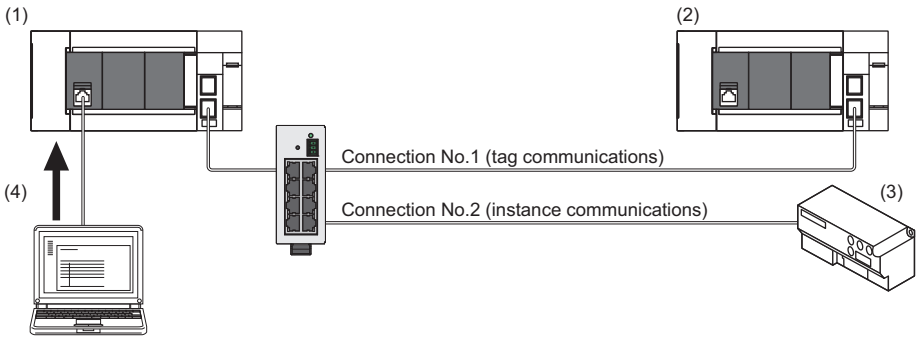
# 4.2 Cyclic Communication Function

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 sending data and sending next data. |
| Timeout Multiplier | Set the time until a connection timeout occurs.*2*3*4 |
| Connection type (input mode/output mode) | Set the method for data sending between the originator and the target. (☞ Page 27 Connection type) |
| Trigger type | Set the data sending 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.<br>Specify which data held by the external device is accessed. (☞ Page 34 Instance ID and tag name) |
| 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 (Requested Packet Interval) × Timeout Multiplier
Example: When RPI is 100ms and Timeout Multiplier is ×8, if data is not received within 800ms, a connection timeout occurs.

*3 When (RPI (Requested Packet Interval) × 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 sending 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 sent for the unset direction to prevent the occurrence of timeouts.

## Connection type

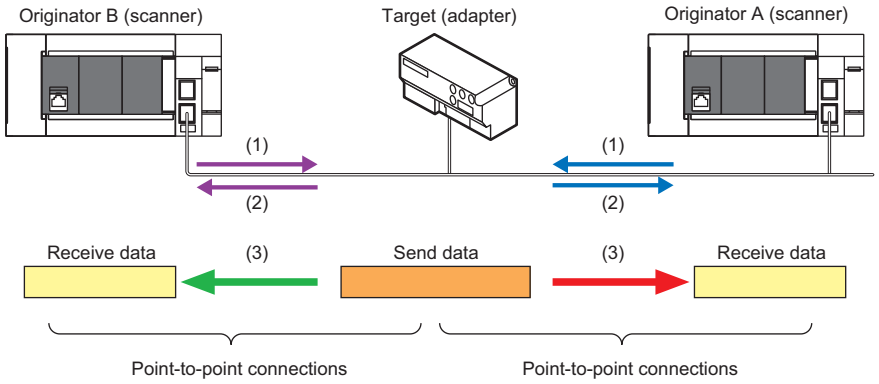
Set the method for data sending between the originator and the target.

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 point-to-point, the target sends a send 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 sends data through unicast.

### ■Multicast

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

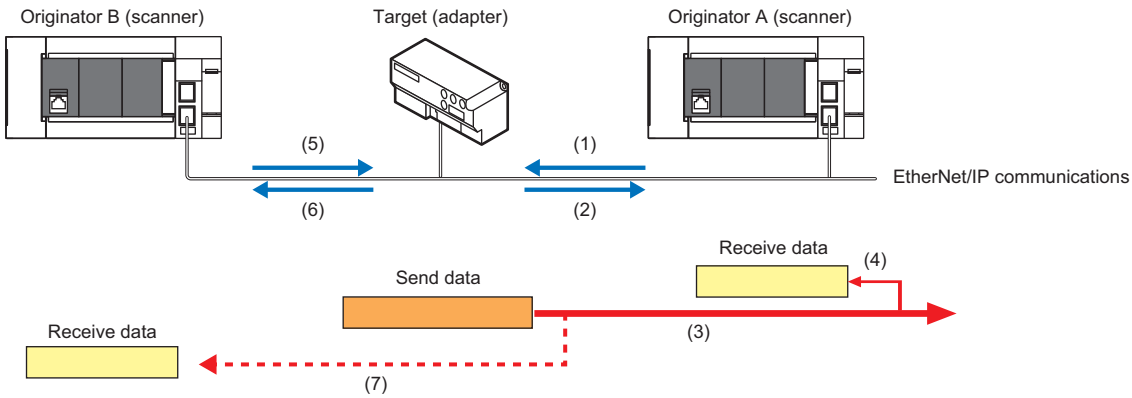
When multiple originators establish a connection through multicast, the target sends end data for all the originators by using one multicast packet. In addition, by using an industrial switch with the IGMP snooping function, communication load on the network can be reduced.

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 sends data using a multicast packet.
(4) Originator A receives the multicast data sent 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 sent in (3).

## Trigger type

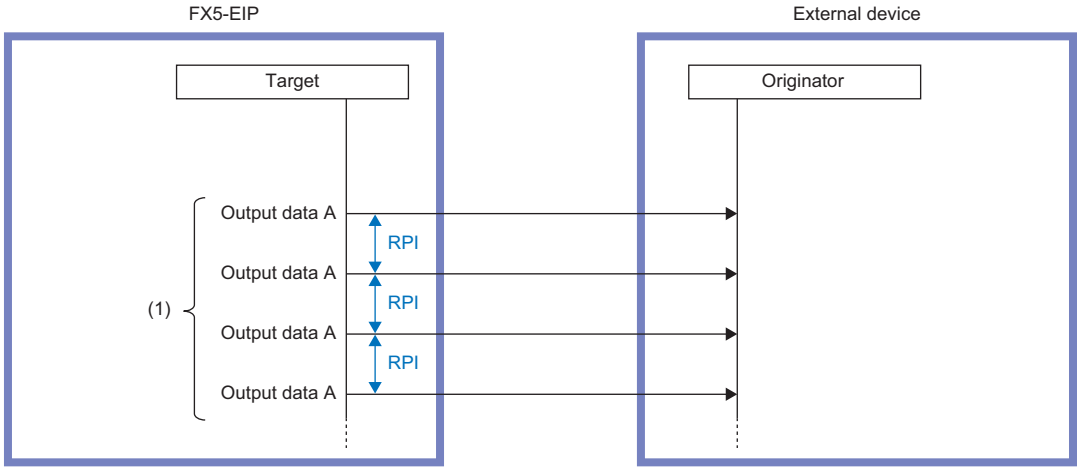
Set the data sending timing.

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

| Trigger type | Description | Condition |
|---|---|---|
| Cyclic | Data is sent at intervals of the set RPI (communication cycle). | — |
| Application Trigger | Data is sent 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 sent when an output data update is detected. | — |

### ■Cyclic

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




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

### ■Application Trigger

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

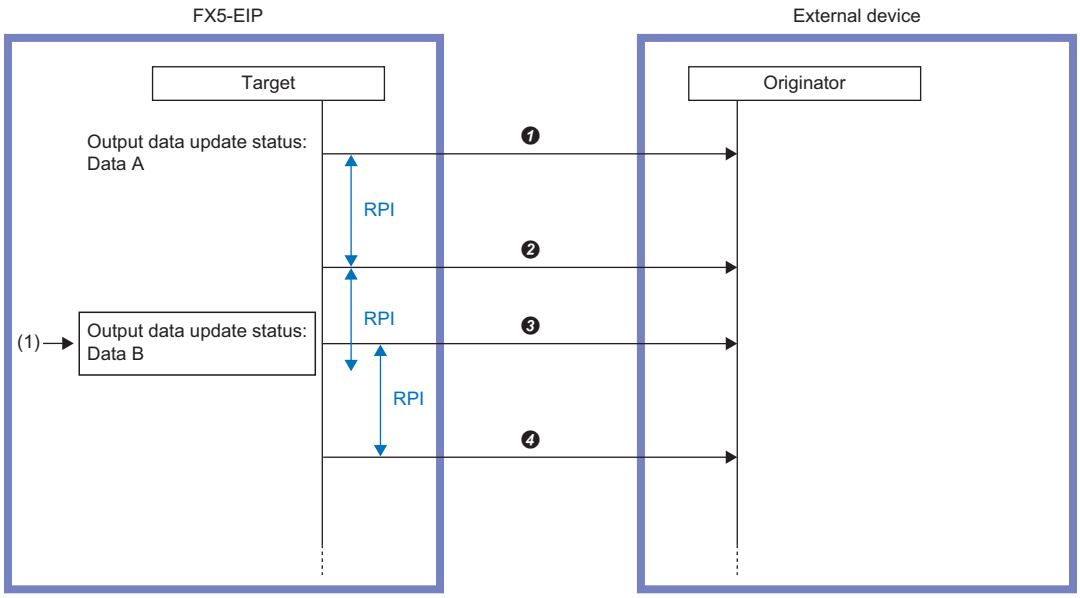
This setting is available only when the FX5-EIP is the originator.

When the FX5-EIP is the originator and the application type is Exclusive Owner, the sending 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 sent 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 send data as the previous one is automatically sent on the line to maintain the connection.




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

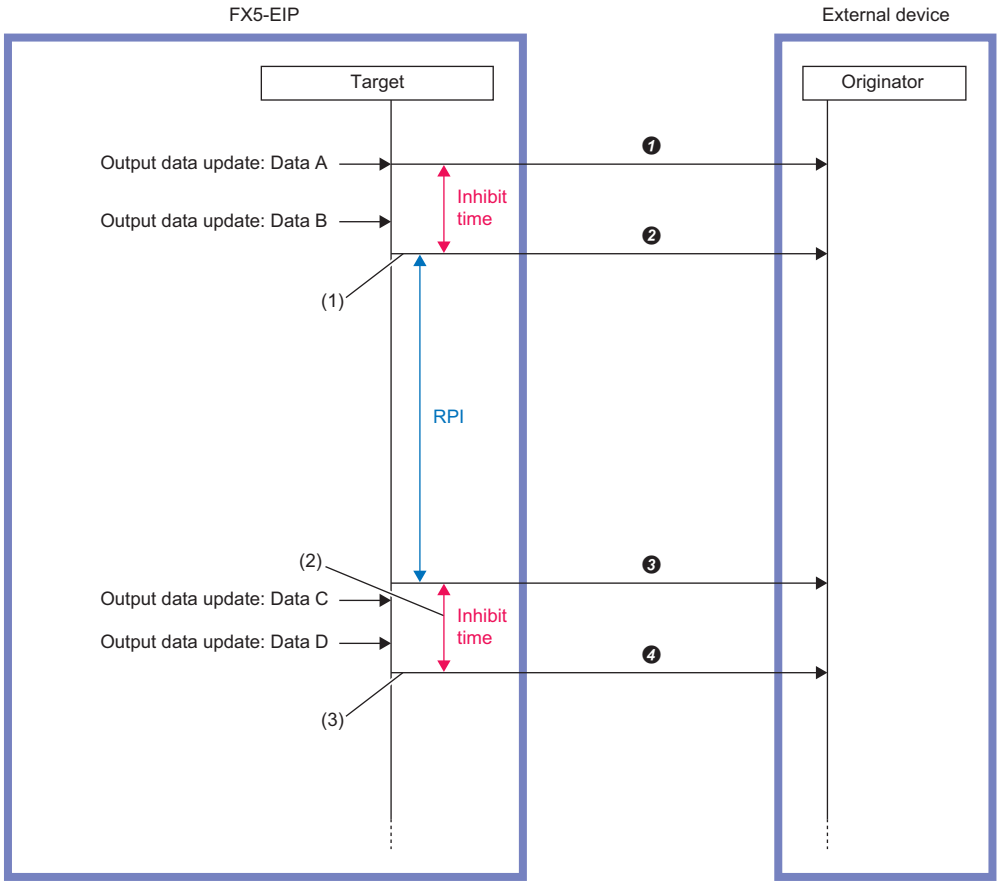
❶ Sending of output data A upon update detection

❷ Sending of output data A upon RPI time lapse (automatic sending)

❸ Sending of output data B upon update detection (ignoring RPI interval)

❹ Sending of output data B upon RPI time lapse (automatic sending)

A new frame cannot be sent 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 sending, other connections will still be able to send.)




(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 send data update, the data is automatically sent, and from that point on, sending of new frames on the line is inhibited until the Inhibit time has elapsed.
(3) If the send data is updated again while waiting for transmission, a frame with the last updated output data is sent on the line.
❶ Sending of output data A upon update detection
❷ Sending of output data B upon update detection
❸ Sending of output data B upon RPI time lapse (automatic sending)
❹ Sending of output data D upon update detection

**Point**

- When the FX5-EIP is the originator, sending 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 sending 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 sent 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, sending triggered by output data update may occur continuously or some data may be lost.
- Continuous sending 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 sent to the EtherNet/IP device, ×: Requests cannot be sent 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 sent 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.

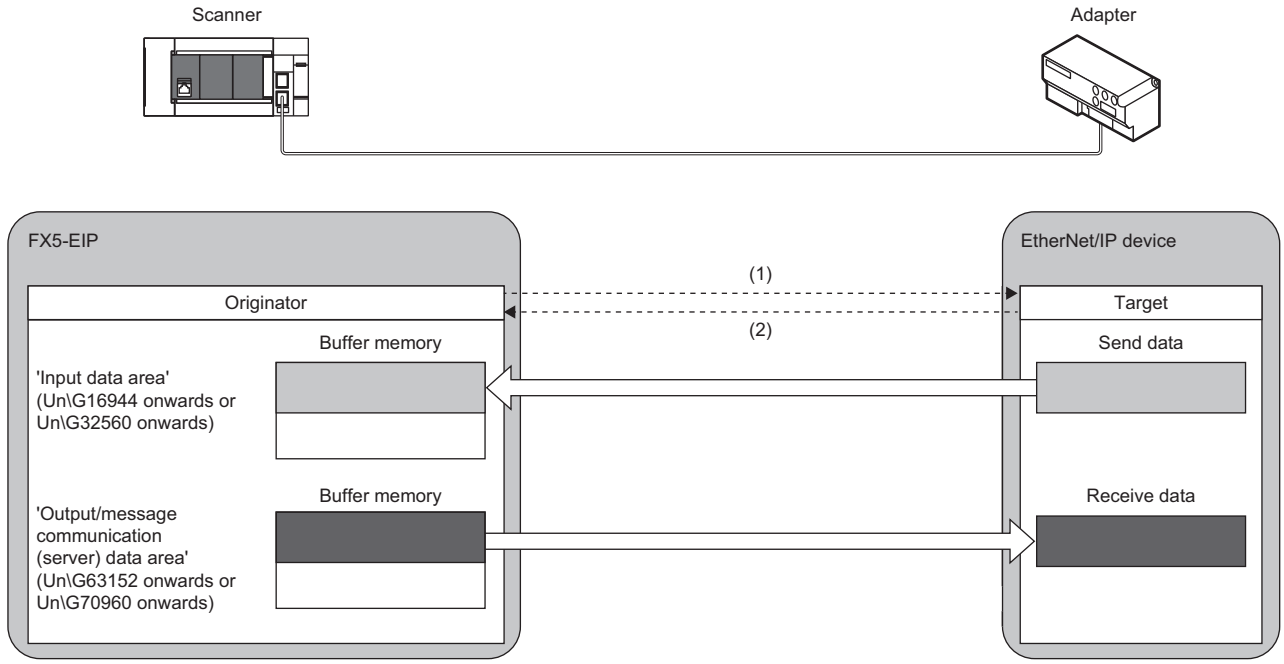
*2 The data size of the heartbeat (alive check packet) used in the Input Only and Listen Only output types (originator to target) is fixed to 0 bytes.

## ■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 sending.



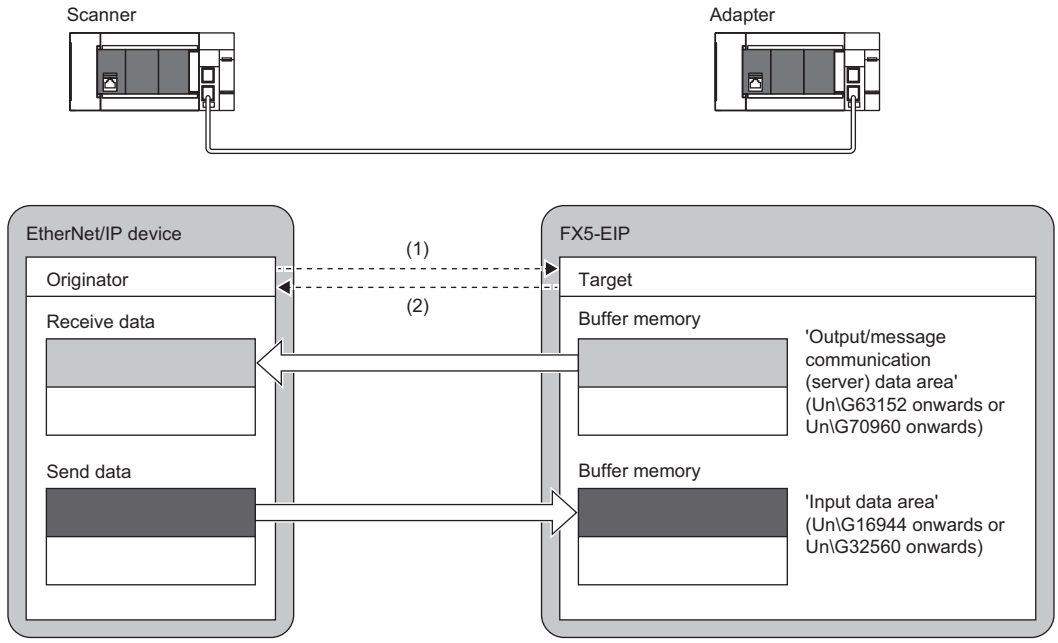

(1) Connection open

(2) Response (normal)

## ■Exclusive Owner (target)

Data sending 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 sending.

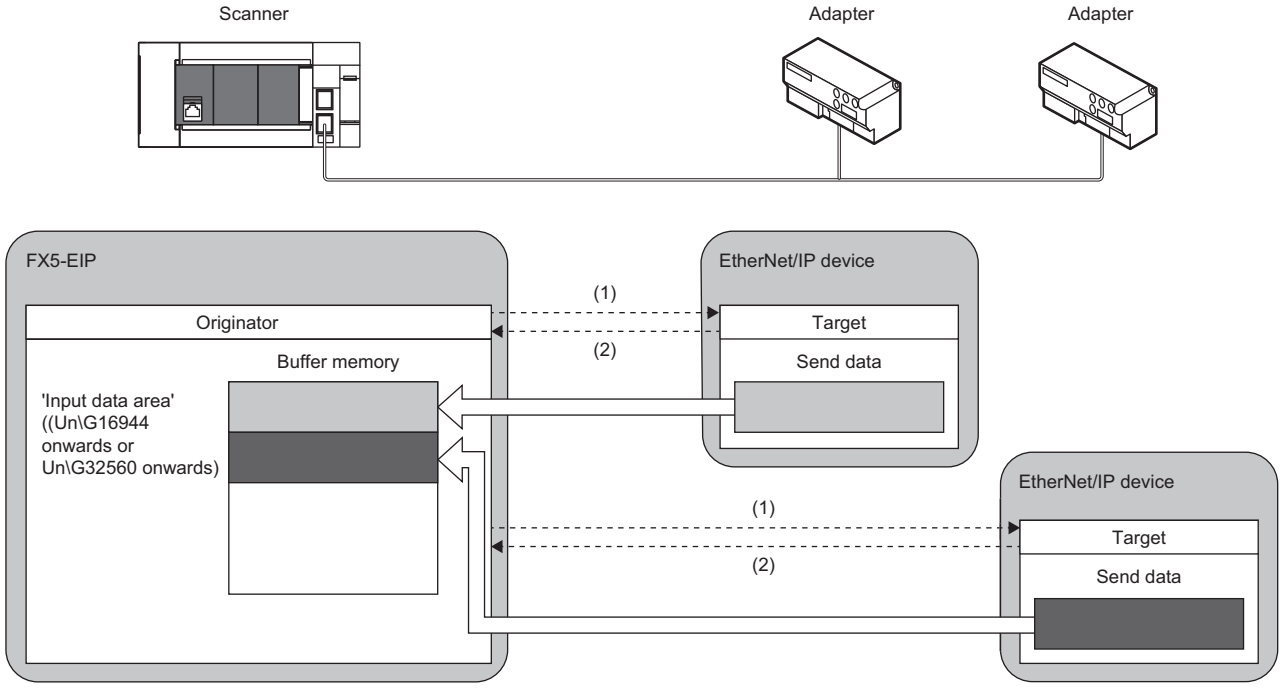



(1) Connection open

(2) Response (normal)

## ■Input Only (originator)

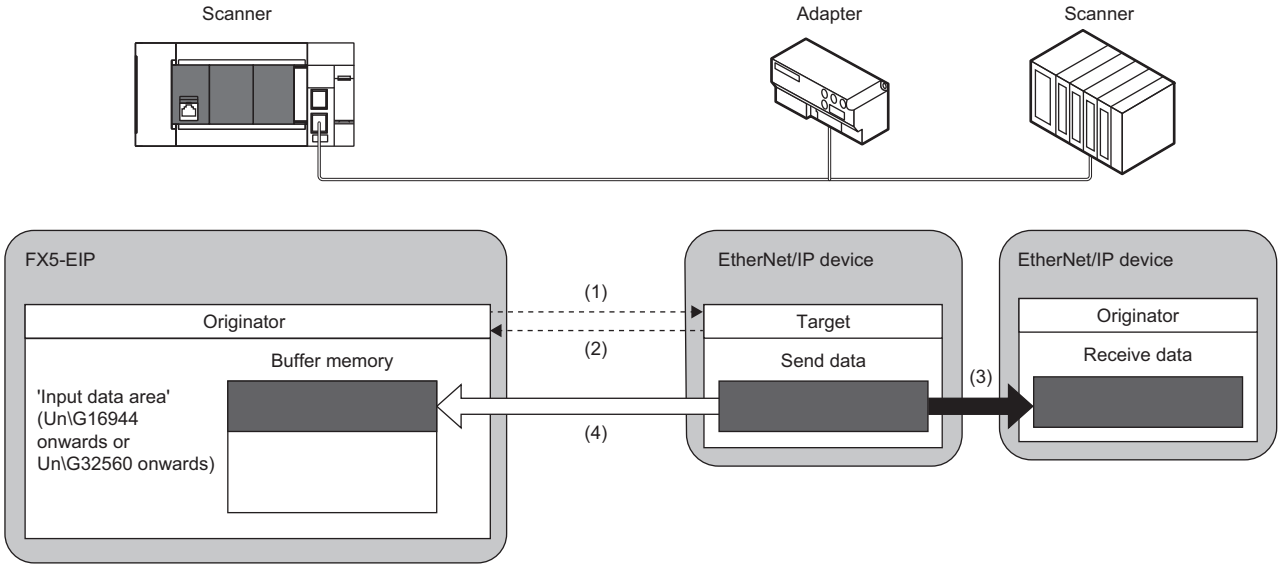
In this application type, only data receiving in the direction from the target to the FX5-EIP (originator) is possible.
Both point-to-point and multicast are supported.




(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 sending.




(1) Connection open
(2) Response (normal)
(3) Data sent over an Input Only or Exclusive Owner connection (data sending 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 separate device manual.

## ■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 sends 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.
It 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

**Point**

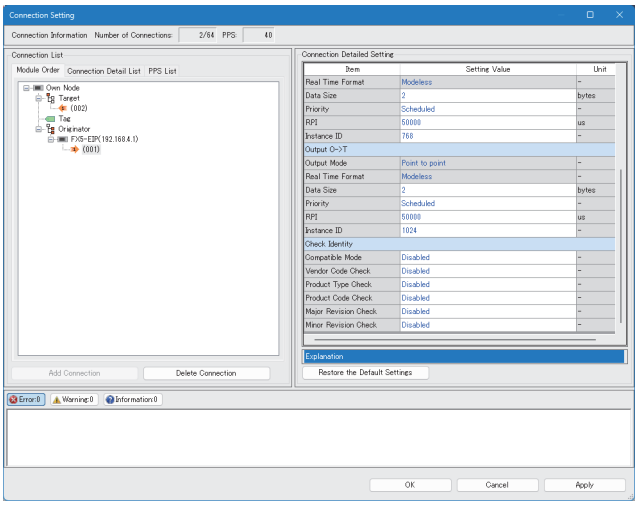
It is possible to check the FX5-EIP device information setting values through the message communications support command identity object. For details, refer to the following.
☞ Page 257 Identity

### ■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 made when specifying the target IP address.[*1] | • Check that the set value is the same as the IP address of the target for communication.<br>• 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 used has not undergone a version upgrade and it is not an old EDS file. |
| Check that proper consistency check settings are being used. | Refer to the following to review the consistency check settings.<br>☞ 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]<br>■Identity object (Class ID: 01H, Instance ID: 01H)[*4]<br>• Attribute ID1: Vendor Id<br>• Attribute ID2: Device Type<br>• Attribute ID3: Product Code<br>• Attribute ID4: Major Revision/Minor Revision<br>• Attribute ID7: Product Name<br>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

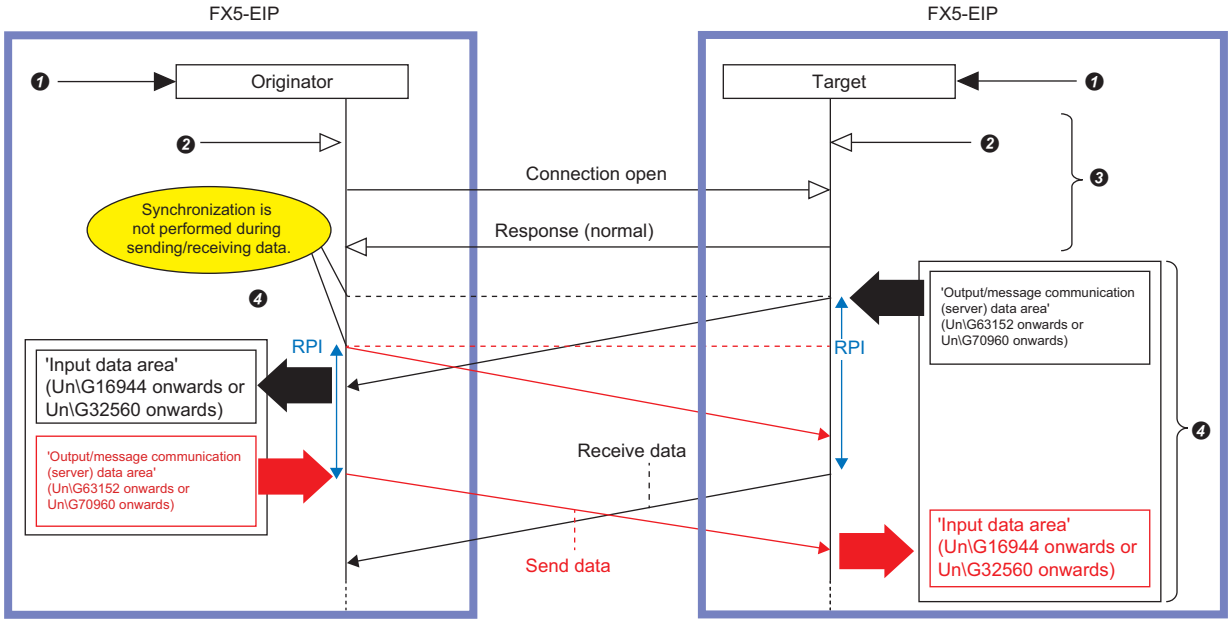
*2 These are the values for the device in the EDS file to be used.

*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-EIP is the originator and the target.




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

**Point**

Since the timing of data sending 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 sending 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 (Starting) 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.*** Sending/receiving data

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

- The data sent 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 sent 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 (Starting) 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.*** Sending/receiving data

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

- The data sent 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 sent 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 for '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.

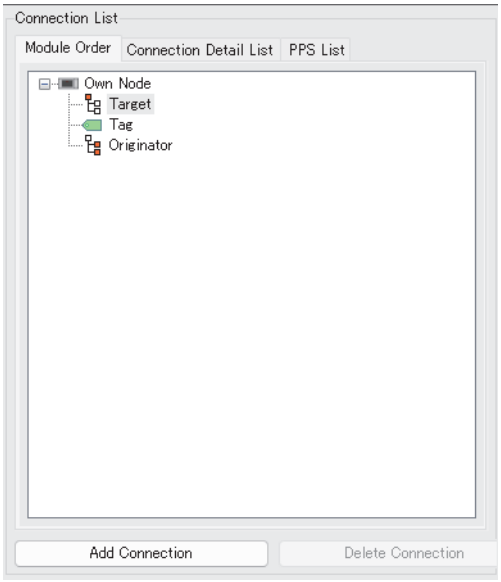
☞ Page 31 Application Type

### ■Target side setting method

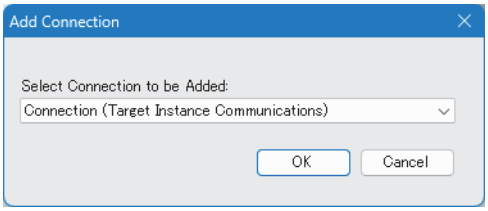
**1.** Open the "Connection Setting" window.

[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 sent 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 | - | - |

**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.

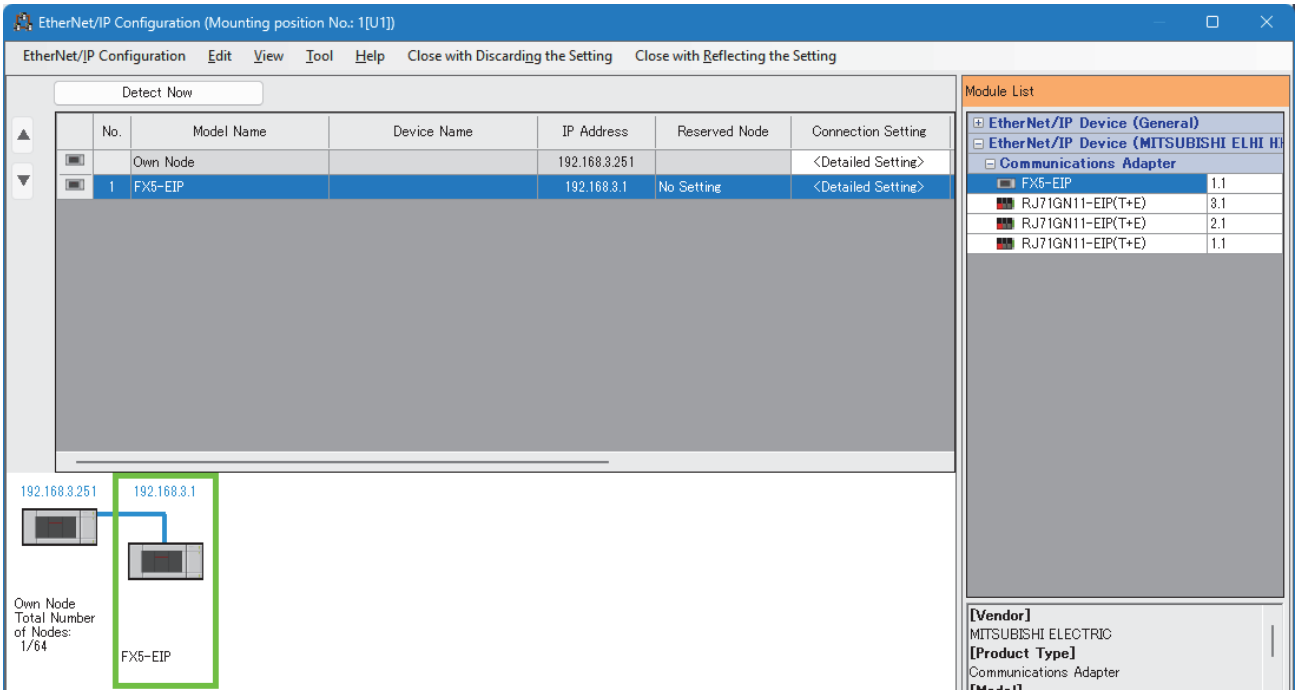
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ FX5-EIP ⇨ [EtherNet/IP Configuration (Module Extended Parameter]

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

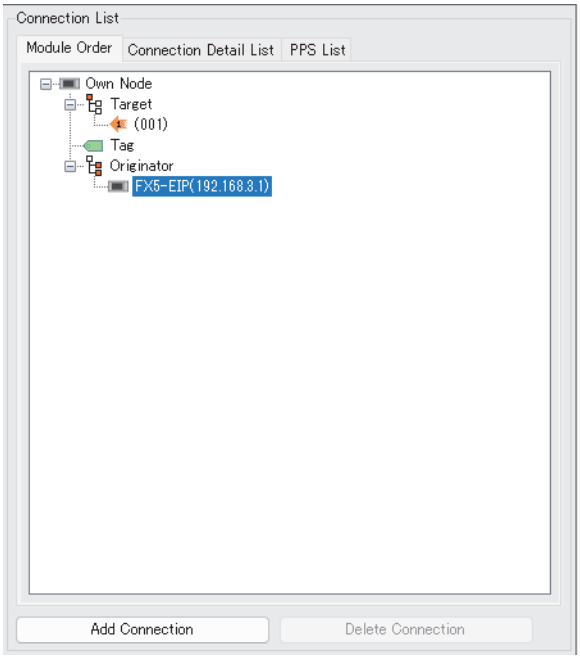
Using "Module List" [EtherNet/IP device (MITSUBISHI ELECTRIC)] ⇨ [Communications Adapter], drag and drop "FX5-EIP" to add.

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.

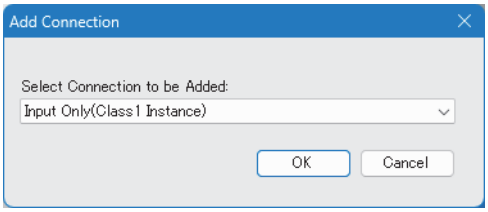
☞ Page 122 Adding/deleting the EDS file



**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

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 | 200 (1) | bytes |
| Priority | Scheduled | - |
| RPI | 50000 | us |
| Instance ID | 768 (2) | - |

Target

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 (1) | bytes |
| Instance ID | 768 (2) | - |
| Input O->T | | |
| Data Size | - | - |
| Instance ID | - | - |

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

**Point**

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

**Point**

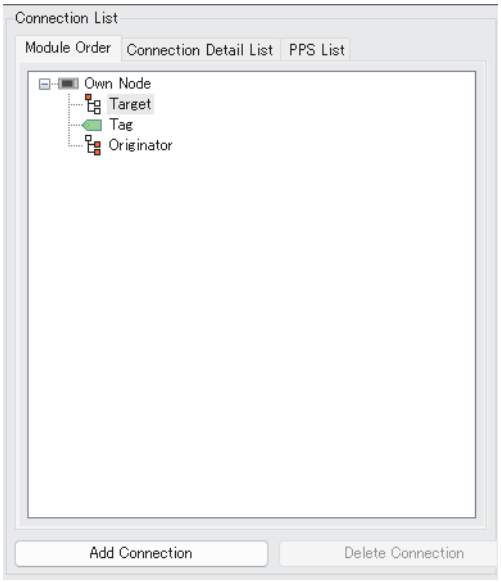
Exclusive Owner can only be set when performing Class1 instance communications.

### ■Target side setting method

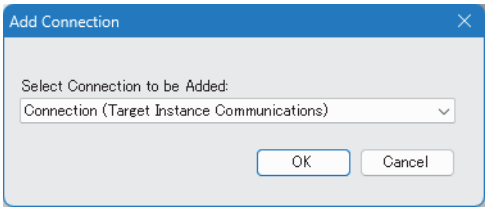
**1.** Open the "Connection Setting" window.

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

**2.** Select a "Target" from 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 "Exclusive Owner".

**5.** Set the data size to be sent 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.

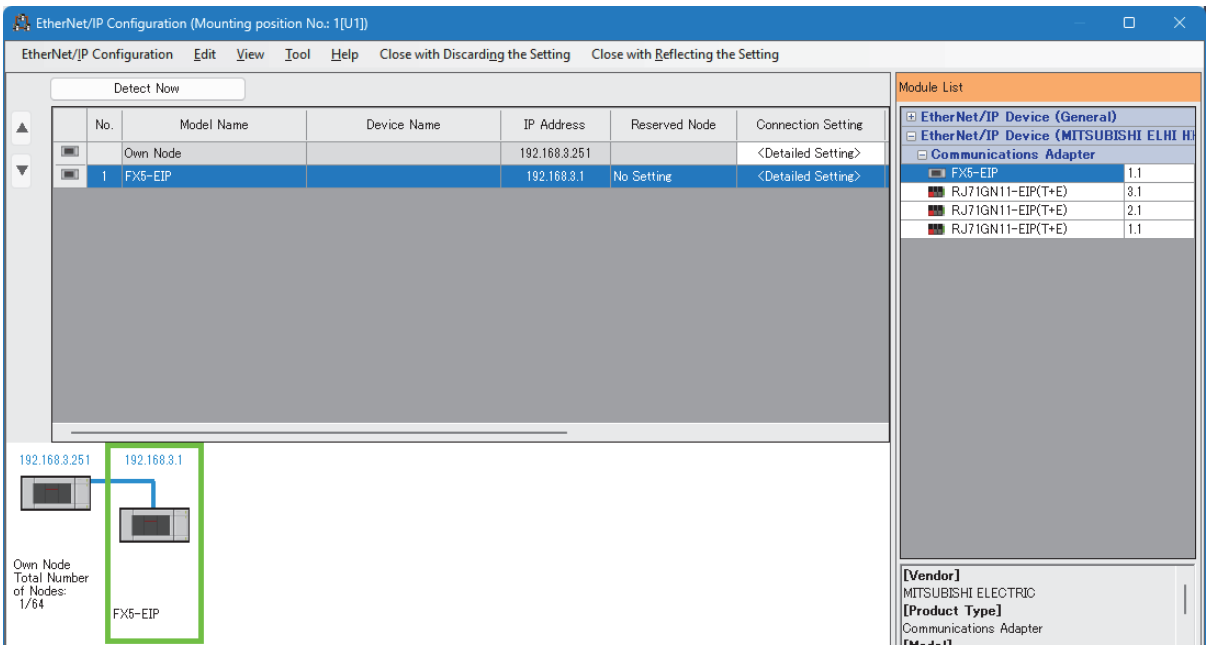
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ FX5-EIP ⇨ [EtherNet/IP Configuration (Module Extended Parameter]

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

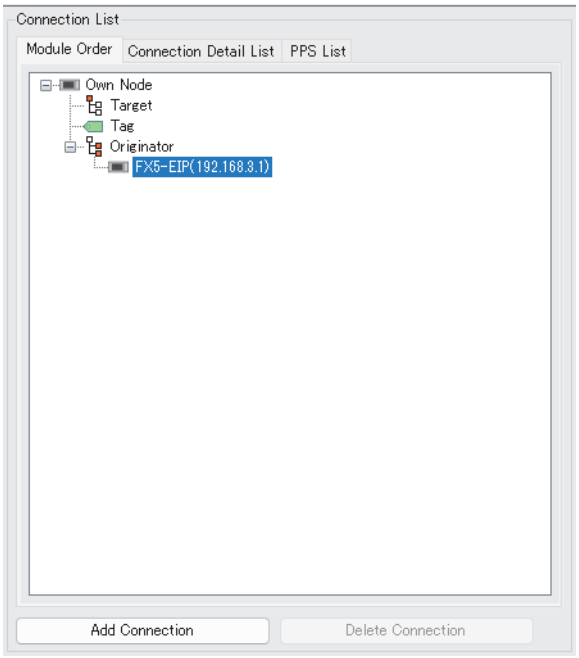
Using "Module List" [EtherNet/IP device (MITSUBISHI ELECTRIC)] ⇨ [Communications Adapter], drag and drop "FX5-EIP" to add.

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.

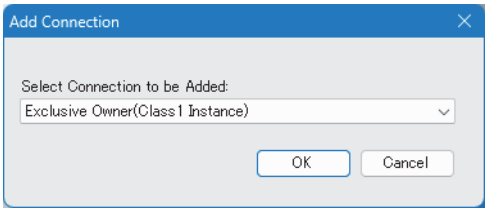
☞ Page 122 Adding/deleting the EDS file



**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.

**Point**

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

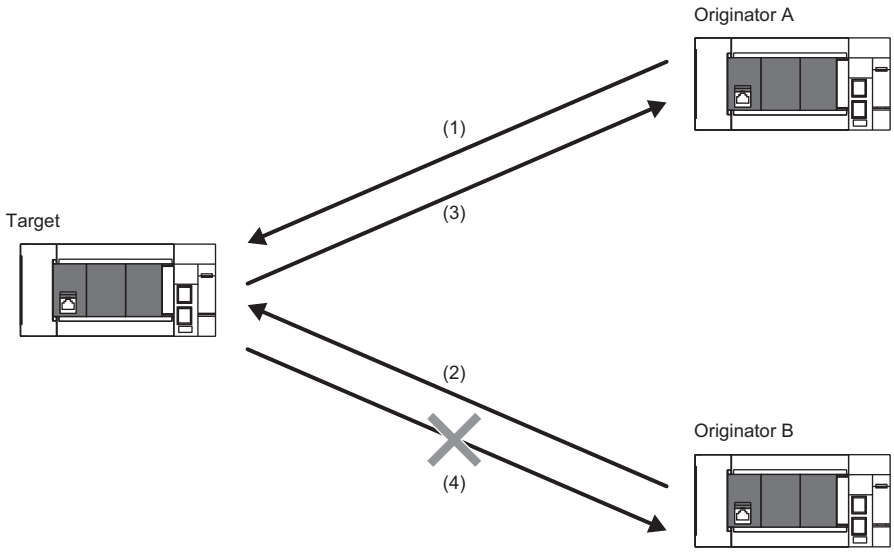
Connection Detailed Setting

| 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.

- Send 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 sends a connection establishment request to target connection number n (n: 1 to 128).
(2) Originator B sends 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 sending "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 sending to multiple originators through multicast
- Originator side: Data sending 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".

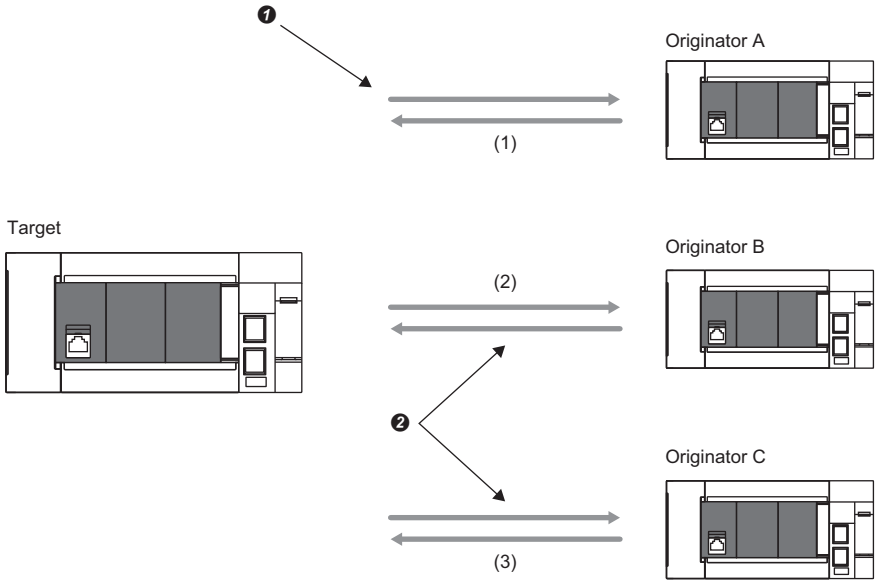
| Input T->O | | |
|---|---|---|
| Input Mode | Multicast | - |
| Real Time Format | Modeless | - |
| Data Size | 200 | bytes |
| Priority | Scheduled | - |
| RPI | 50000 | us |
| Instance ID | 768 | - |

Ex.

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

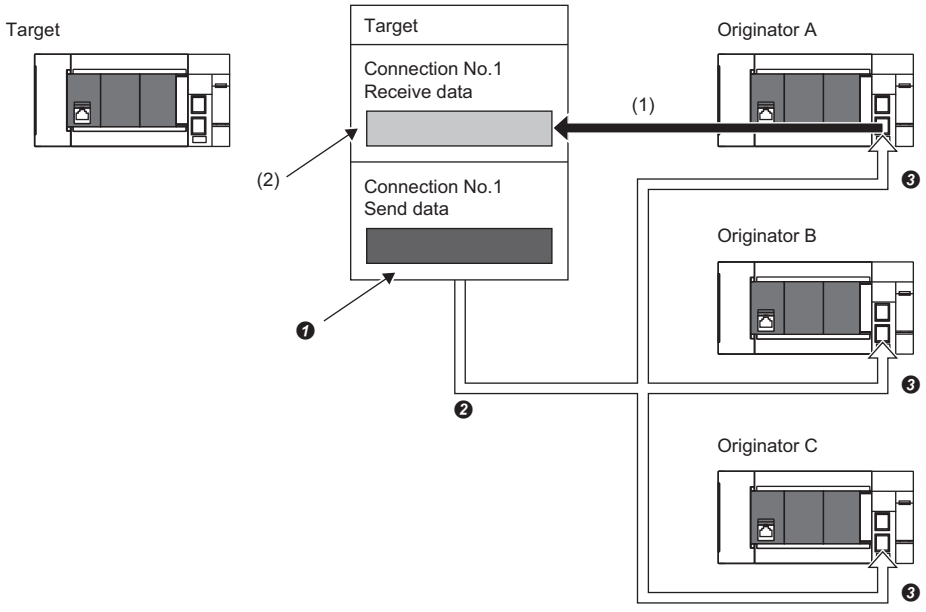
While receiving the data sent from originator A, the target can send the same data to originators A to C through multicast.

• 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)).
❶ The target-to-originator instance ID is set to 768 and the originator-to-target instance ID is set to 1024.
❷ 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 sends 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).
❶ Data sent 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).
❷ The target sends data to each originator through multicast.
❸ Data sent 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)

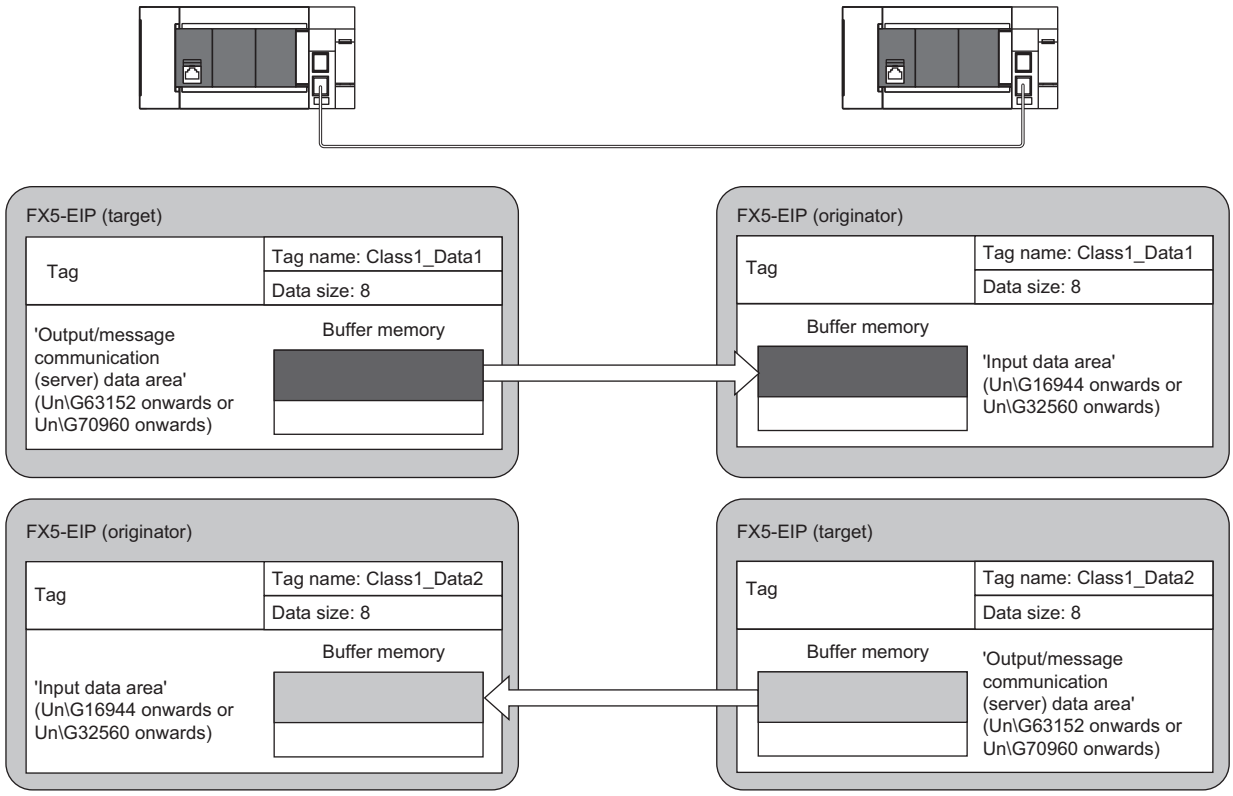
# Class1 tag communications

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.

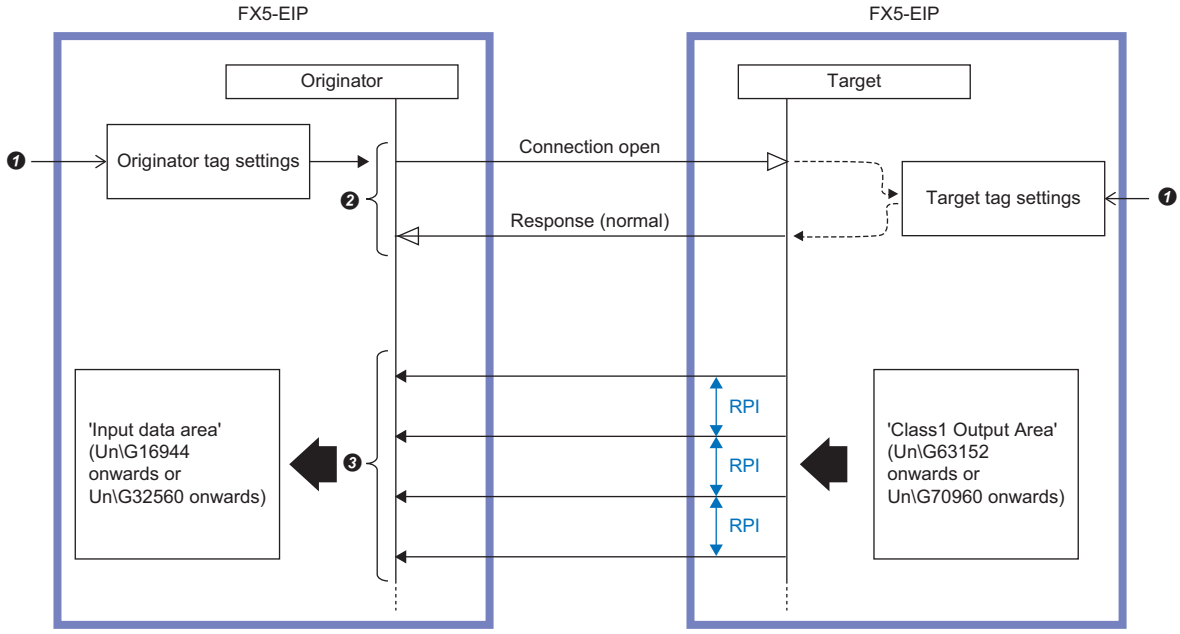
In tag communications, data communications can be performed only in a single direction: from the tag set by the target to the tag set by the originator. To perform data communication both ways, both sides need to become originators.

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




| Type | Description |
|---|---|
| Target-side tag | Receives a connection open request from the originator to be communicate with, and sends data to the tag with the same name. |
| Originator-side tag | Sends 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 sent 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 (Starting) 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.*** Sending/receiving data

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

- The data sent 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 (Starting) 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.*** Sending/receiving data

When a connection is opened normally, data is sent/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 sent 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.

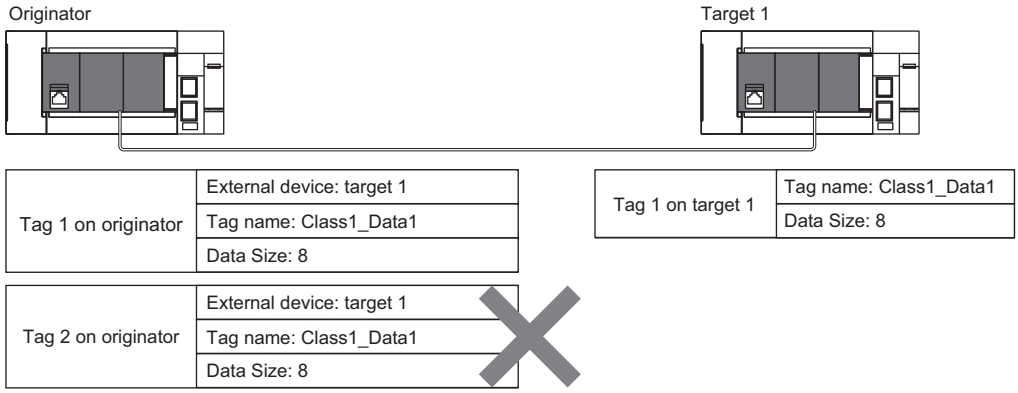
## Precautions

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.

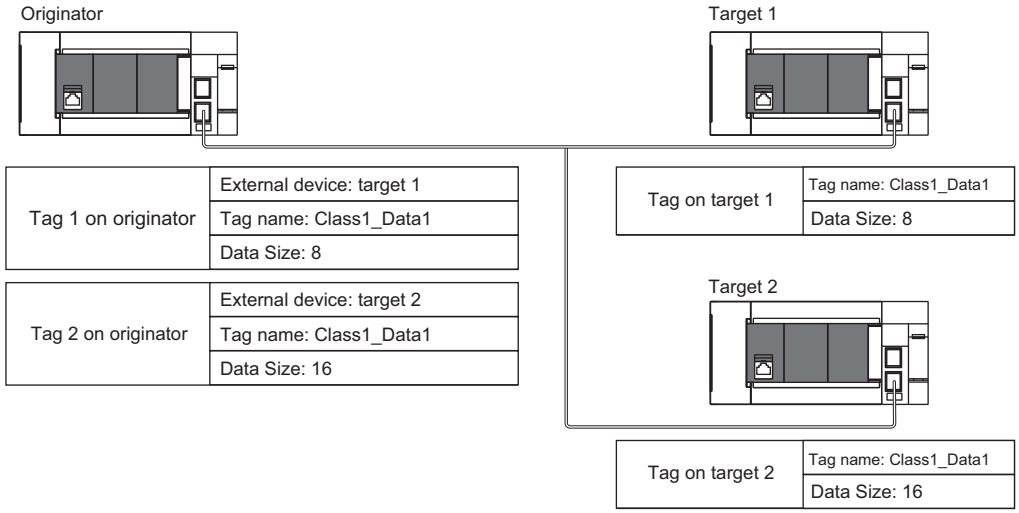
- Tags with the same name cannot be set in the FX5-EIP regardless of the data size. (Tag names are not case-sensitive.)


- The setting for opening multiple connections for the tag held by the external device cannot be made. (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 sent 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).

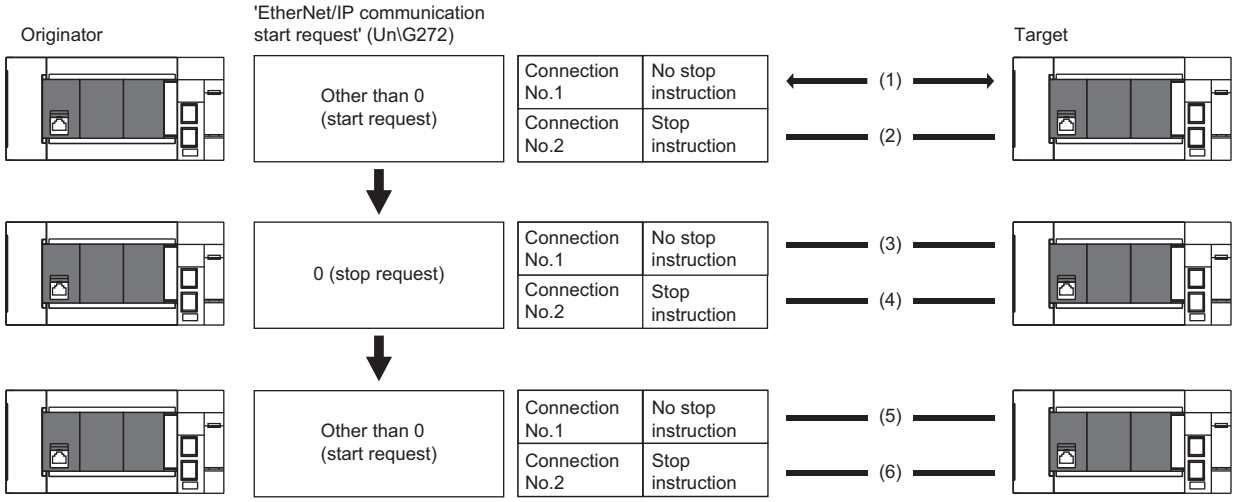
When the bit corresponding to the connection number to be stopped is turned on, cyclic communication stops, and when that bit is turned off, cyclic communication restarts.

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. |
| Not 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)s 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). |

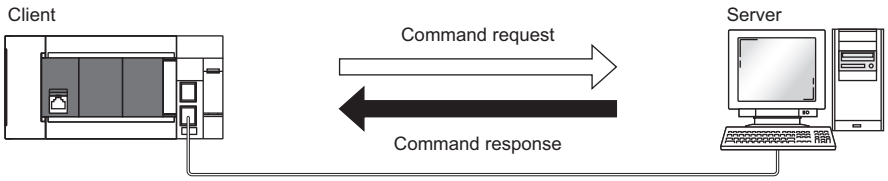
For details on the buffer memory, refer to the following.

☞ Page 245 Cyclic communication pause

# 4.3 Message Communication Function (Client)

## Function overview

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




The available functions include the general message communication client function for sending 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 sending a message for such purposes as monitoring. |
| UCMM instance communications | Not available | Buffer memory | | Used when sending 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 sent to the server. Data and parameters of the external device can be read/written according to the command request set in the sent message.

### ■Tag communications

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

In tag communications of message communication, the request-sending 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 shows the processing for command requests sent by the client.

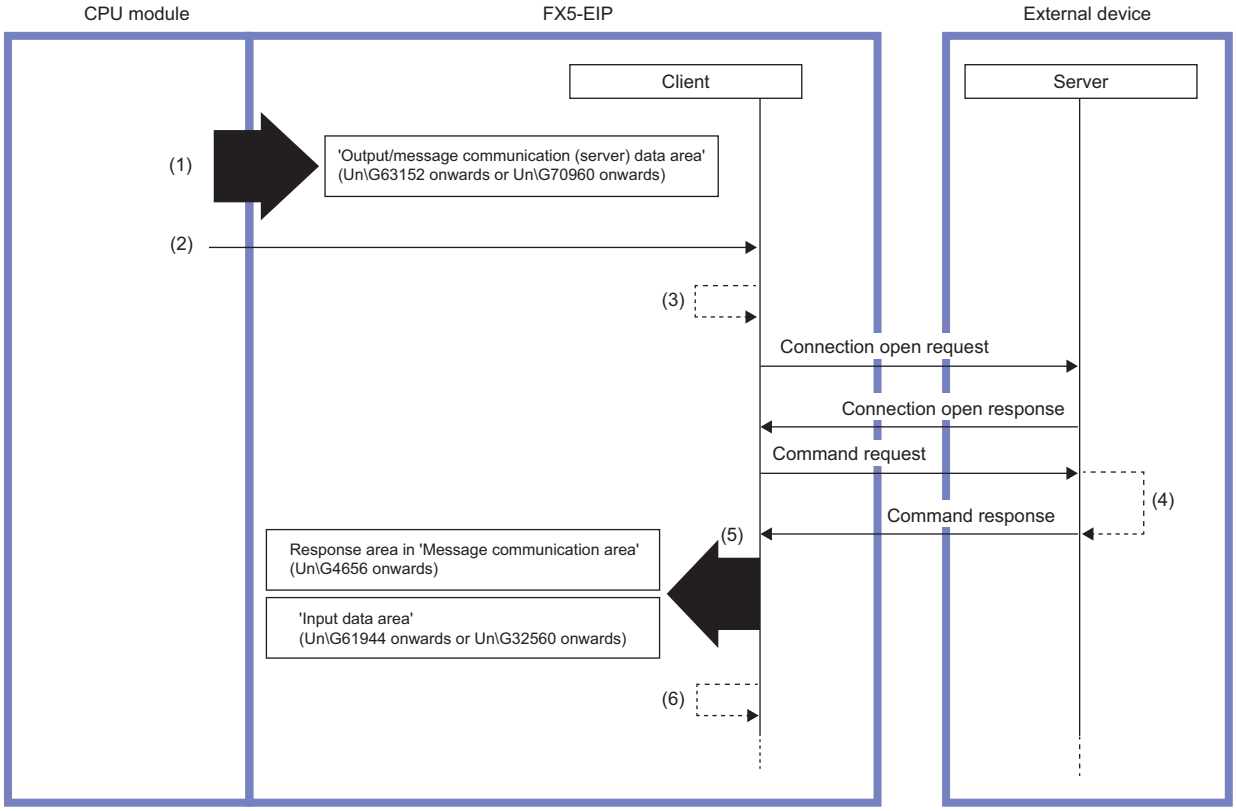
| Type | | Description |
|---|---|---|
| Client | Read | Sends a Read request to the tag of the external device, and reads external device data in the 'Input data area' (Un\G16944 onwards or Un\G32560 onwards). |
| | Write | Sends a Write request to the tag of the external device, and writes data in '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 sent 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 sending 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 sent to the external device. (Specified in a little-endian format byte string)<br>A valid area is judged based on the data size set in the Class3 communications parameters.<br>Since the data size is set in byte units, an area with the data size ÷ 2 (rounded up) is valid.<br>This setting is not required when 0 is set for Data Size. |

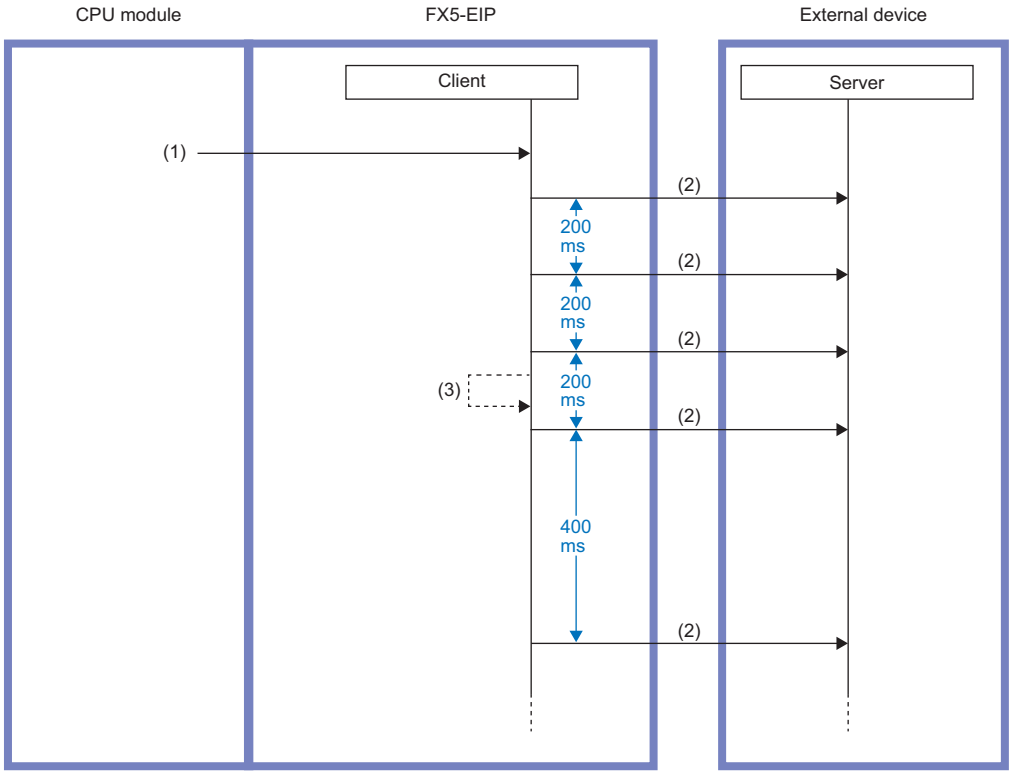
## Data sending/receiving

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

☞ Page 68 Sending/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 sending 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 method 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)

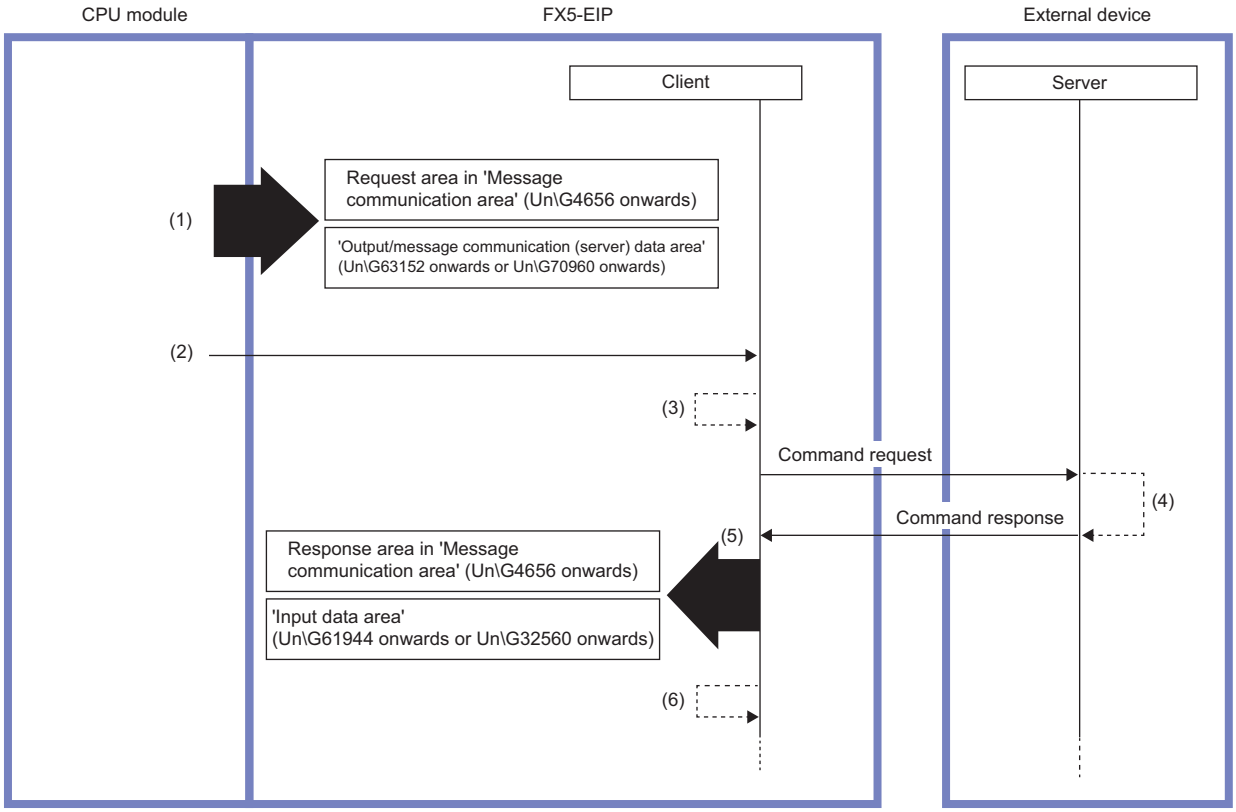
# UCMM instance communications (client)

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 sent 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 sending 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 sent, 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 sent 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<br>Set 0 if the setting is not required. |
| | Communication method 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 |
| | Output/message communication (server) data area | Un\G63152 onwards or Un\G70960 onwards | Request data (specified in a little-endian format byte string)*1<br>The setting is not required if not necessary. |
| Option settings | RPI | Un\G4661 | 00C8H to EA60H (200ms to 60000ms)<br>Set any sending interval. |
| | Trigger Type | Un\G4663 | 0000H: Application Trigger (default)<br>0010H: Cyclic<br>When Cyclic is set, data is periodically sent 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 × (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 × (N-1) to the address value of the first area.
For 128 connections, add 300 × (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 (Starting). When EtherNet/IP communication starts, the values set in "Required Settings" above will be cleared to 0.

## Data sending/receiving

For details on sending and receiving data for UCMM message communications, refer to the following.
☞ Page 68 Sending/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 method 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.

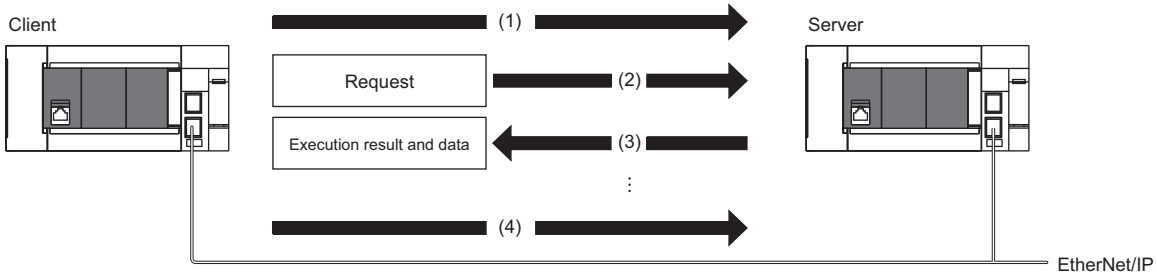
## Buffer memory operation

For details on the buffer memory operation, refer to the following.
☞ Page 129 For UCMM instance communications (client)

# Class3 tag communications (client)

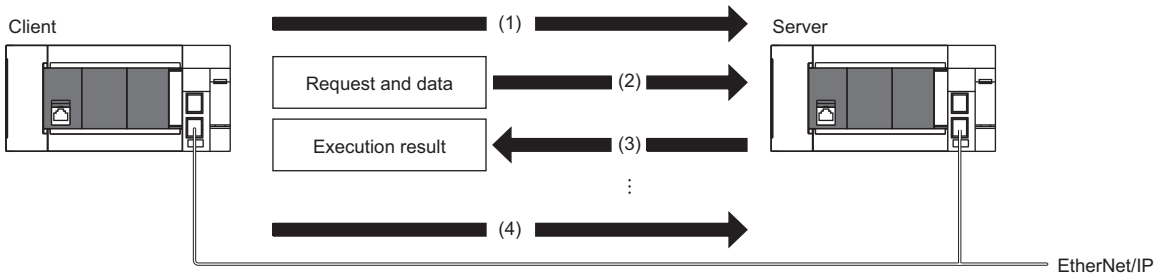
Establishes a connection and read/write data.

- 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 procedure 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 sent to the external device. (Specified in a little-endian format byte string)<br>A valid area is judged based on the data size set in the Class3 communications parameters.<br>For the data size, the area of size (Size) × (Data Type) becomes valid.<br>(1 (word) when Data Type is [INT], and 2 (word) when Data Type is [DINT])<br>This setting is not required when service is set to read. |

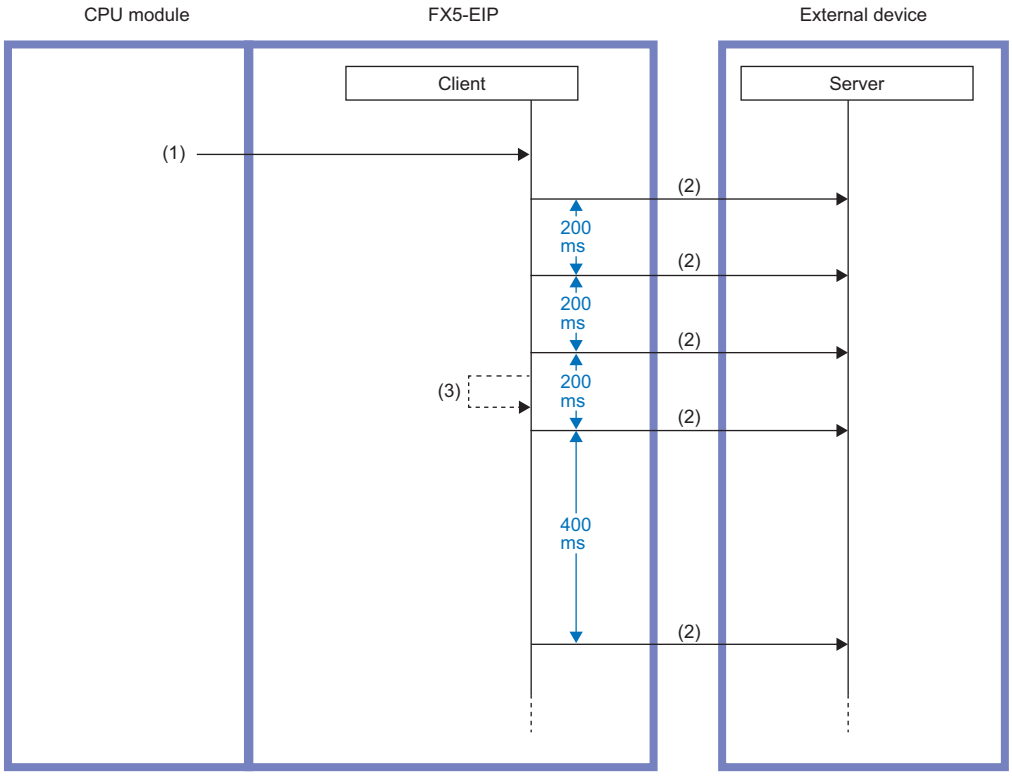
## Data sending/receiving

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

☞ Page 68 Sending/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 sending 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 method 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

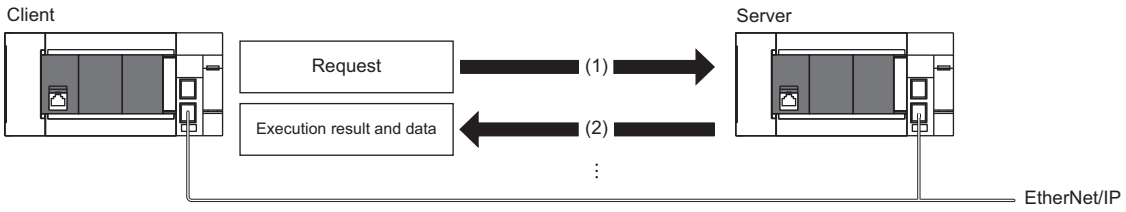
For details on the buffer memory operation, refer to the following.
☞ Page 128 For Class3 tag communications (client) (Write)

# UCMM tag communications (client)

Without establishing a connection, data is read/written.

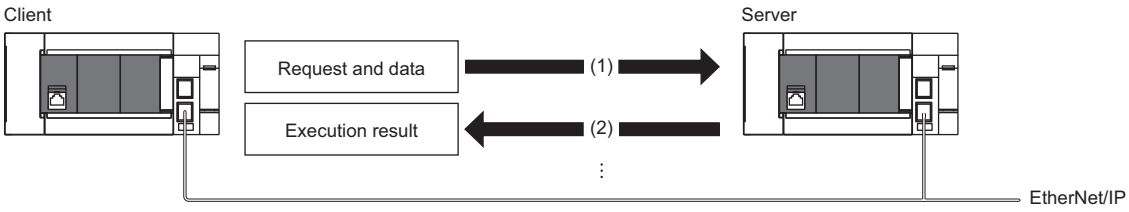
The data set in 'Request area in message communication area' (Un\G4656 onward) is sent as a command request, and the response data from the external device is stored in the response area of 'Response area in message communication area' (Un\G4816 onwards). (When connection number is 1)

- 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 procedure necessary for executing tag communications.

1. Check the content of the tag 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 method specification | Un\G4656 | 0001H: UCMM communications (fixed) |
| | Communication method specification | Un\G4657 | 0002H: Tag communications |
| | Service | Un\G4658 | • 124CH: UCMM/Class3 Read Originator (for Read request)<br>• 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 | • 00C3H: INT (signed 16-bit data)<br>• 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.) |
| | Output/message communication (server) data area | Un\G63152 onwards or Un\G70960 | Write data for Write request<br>An area of the size (Data Size) × (Data Type type) becomes valid.<br>(1 (word) when Data Type is [INT], and 2 (word) when Data Type is [DINT])<br>When UCMM/Class3 Read Originator is set for Service, the setting is not required. |
| Option settings | RPI | Un\G4661 | 00C8H to EA60H (200ms to 60000ms)<br>Set any sending interval. |
| | Trigger Type | Un\G4663 | 0000H: Application Trigger (default)<br>0010H: Cyclic<br>When Cyclic is set, data is periodically sent 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<br>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 × (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 × (N-1) to the address value of the first area.
For 128 connections, add 300 × (N-1) to the address value of the first area.

## Data sending/receiving

For details on sending and receiving data for UCMM tag communications, refer to the following.
☞ Page 68 Sending/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 method 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)

# Sending/receiving data for the message communication function (client)

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

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

## Sending/receiving data for message communications using the buffer memory

Data is sent/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.<br>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). |

### ■Send 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 × (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 × (N-1) to the address value of the first area.
For 128 connections, add 300 × (N-1) to the address value of the first area.

***1.*** 'EtherNet/IP communication start status' (Un\G273) becomes 1 (Starting) 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 method specification' (Un\G4656) in the request area of the message communication area.

***3.*** When the value of 'Communication method specification' (Un\G4656) is 0001H (UCMM communications), set 'Communication method specification' (Un\G4657) to 'Tag Name' (Un\G4673 onwards). When the value of 'Communication method 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 sending a write request to the external device, such as when 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 the '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

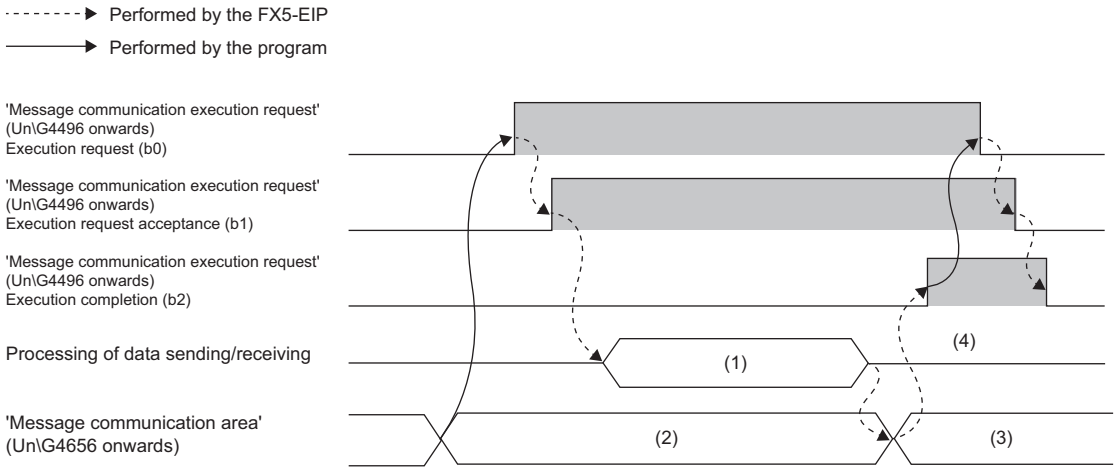
- Areas where Class1 communication parameters and Class3 communication parameters are set in "EtherNet/IP Configuration" become dedicated to the communication type. For areas where Class1 communication parameters and Class3 communication parameters are not set, the initial value of 'Communication method 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 method specification' (Un\G4656) is rewritten by a program, the communication request may fail and an error may occur. Care must be taken so as not to rewrite it.
- If data sending/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

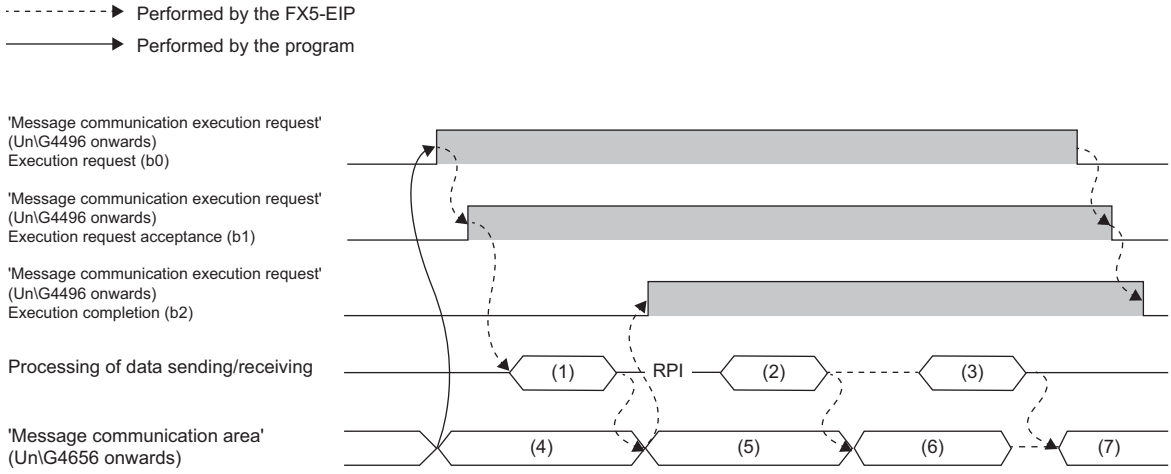
A message is sent only once for one request.




(1) Communication execution
(2) Request area
(3) Response area
(4) No data sending from this point onward

• When the trigger specification is Cyclic

Messages are sent 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.)




(1) Communication execution (Cyclic 1st time)
(2) Communication execution (Cyclic 2nd time)
(3) Communication execution (Cyclic Nth time)
(4) Request area
(5) Response area (Cyclic 1st time)
(6) Response area (Cyclic 2nd time)
(7) Response area (Cyclic Nth time)

**Point**

The following describes the operations when the trigger specification is changed between the time when bit 1 (execution request acceptance) of the 'Message communication execution request' (Un\G4496 onwards) execution request acceptance turns on and the time when bit 0 (execution request) of the 'Message communication execution request' (Un\G4496 onwards) execution request turns off. (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 bit 0 (execution request) of 'Message communication execution request' (Un\G4496 onwards) execution request off, check that bit 1 (execution request acceptance) of 'Message communication execution request' (Un\G4496 onwards) execution request acceptance and bit 2 (execution completion) of 'Message communication execution request' (Un\G4496 onwards) execution completion are off, and then turn bit 0 (execution request) of 'Message communication execution request' (Un\G4496 onwards) execution request on.
- 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.



## Sending/receiving data for message communications using module function blocks

Execute data sending/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 FB |
|---|---|---|---|
| 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.<br>However, a request number used by another module function block or the message communication area numbers used for sending and receiving message communication using buffer memory (☞ Page 68 Sending/receiving data for message communications using the buffer memory) cannot be used. Be careful about duplication.<br>(Identical numbers can be used as long as they are not requested at the same time. In that case, however, mutual exclusion is required. Managing request numbers based on different numbers is therefore recommended.) |

### ■Send 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 set incorrectly, or sending 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 sent 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 shows 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.<br>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 sent periodically at the set RPI interval.<br>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**

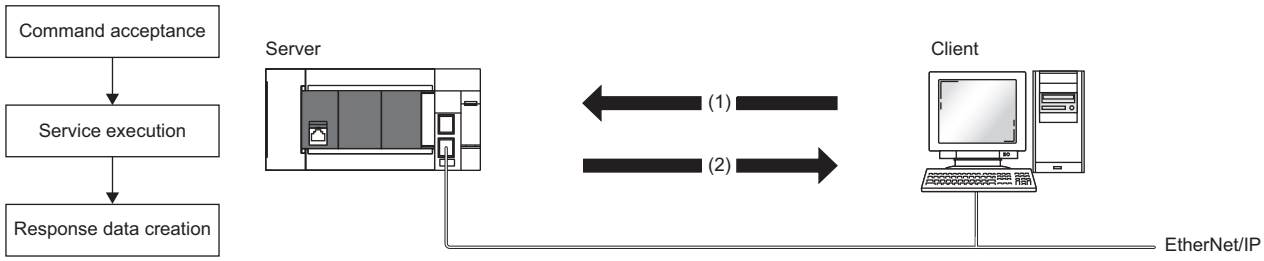
The following describes the operations when the trigger specification is changed during the time between i_bEN (Execution command) of the module function block turning on and turning off.

- 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 sent by the client and returns a response.




(1) Command
(2) Response data

The available functions include the instance communications server function for accepting a command request sent 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 sends response data. |
| | UCMM instance communications | Not available | Processes command requests received from the client and sends 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: Starting" 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.*** Send a command request from the client.

## ■Buffer memory area assigned to a tag

For a tag 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 shows 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) × 722.

*2 The buffer memory address for connection number n can be calculated by 32560 + (n-1) × 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 | • INT: 1 word<br>• DINT: 2 words |
| Data Size | Size of request data from the client |

**Point**

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 shows the operations when a Read/Write request is received.

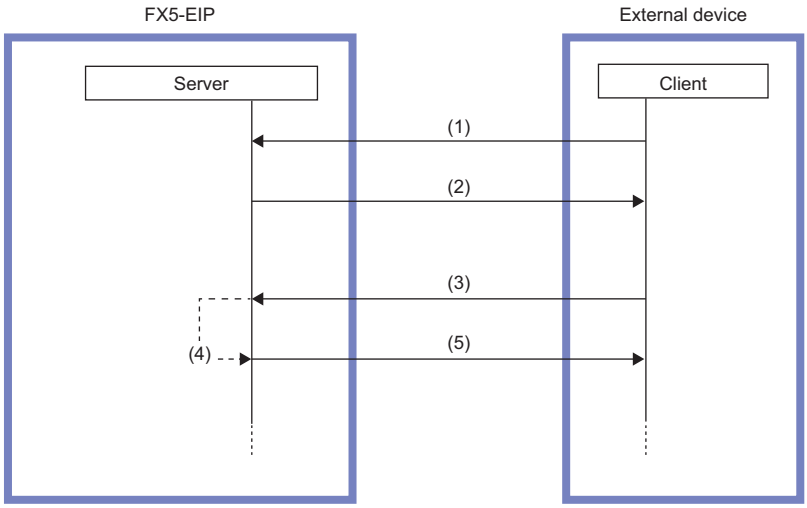
| Type | Description |
|---|---|
| Read | When a Read request is received from the external device (client), sends data of the requested size, starting from the start address corresponding to each connection number in 'Output/message communication (server) data area' (Un\G63152 onwards or Un\G70960 onwards),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

**Point**

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)

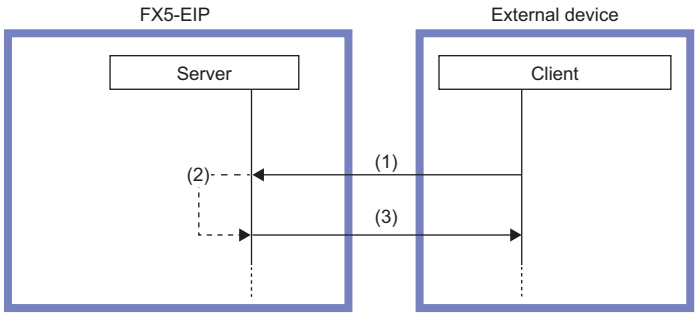
After a connection open request from the client is accepted, a command request accepted from the client is processed and response data is sent.




(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 sends response data without establishing a connection between the FX5-EIP and the external device.

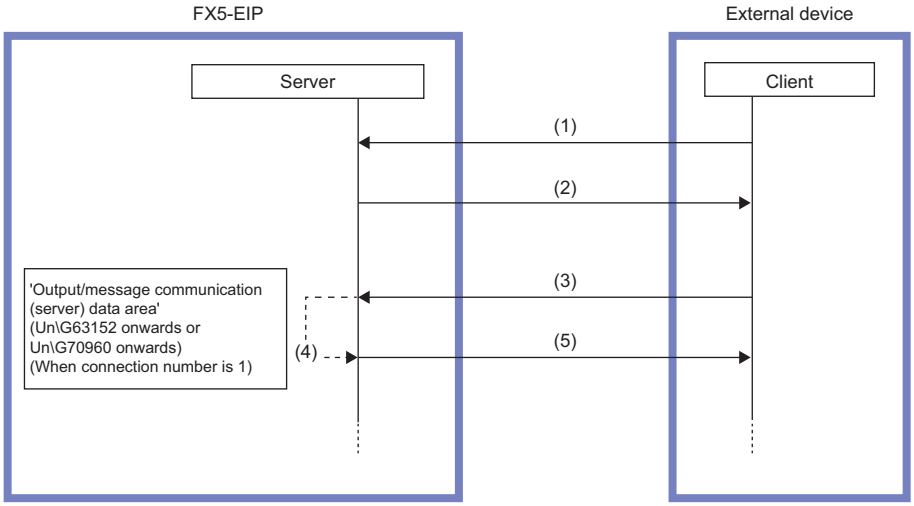



(1) Command request
(2) Command processing execution
(3) Command response

# Class3 tag communications (server)

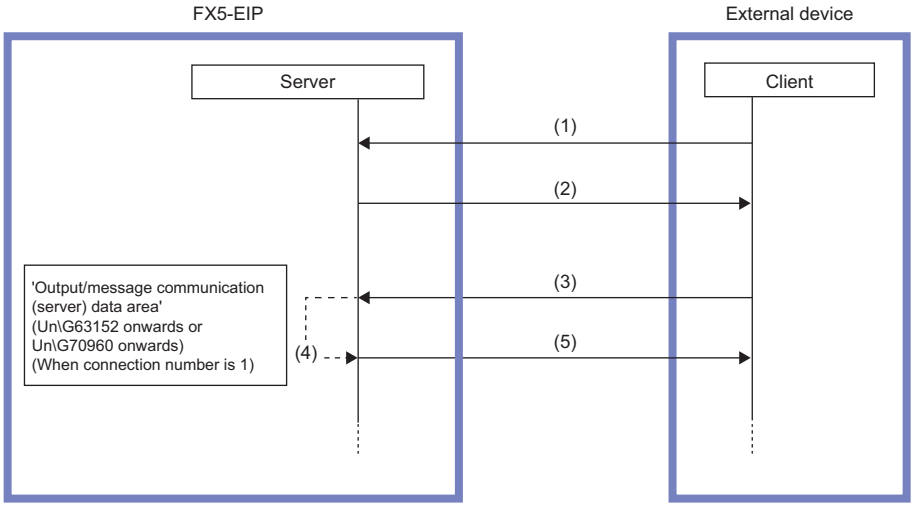
Accepts connection open request and Read/Write request from the client and processes data for the tag set to the FX5-EIP after establishing a connection.

## 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

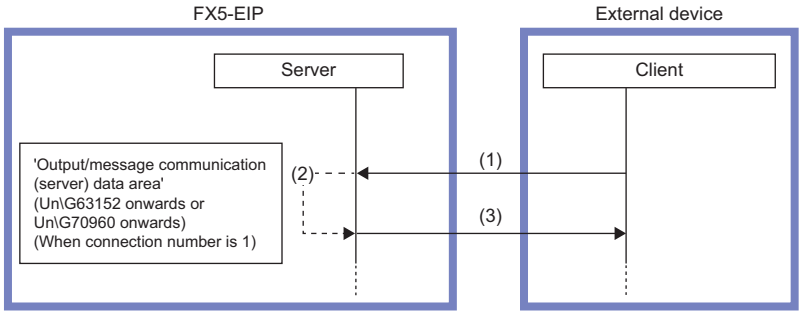
For details on the buffer memory operation, refer to the following.

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

# UCMM tag communications (server)

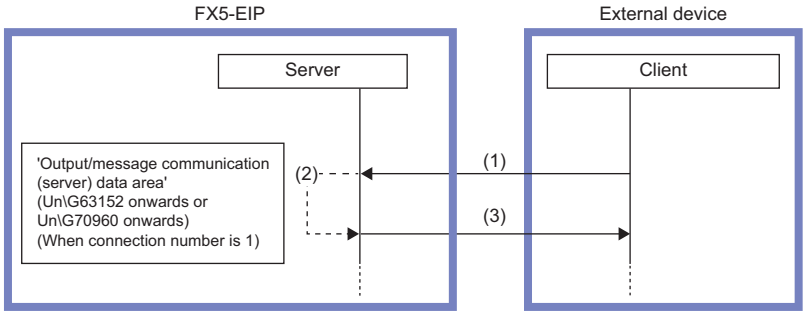
Accepts a Read/Write request from the client and processes data processed for the tag set to the FX5-EIP without establishing a connection.

## 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

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 made for each module.
Therefore, EtherNet/IP communications can be continued even when the stop error occurring CPU module goes into the STOP state.

## Setting method

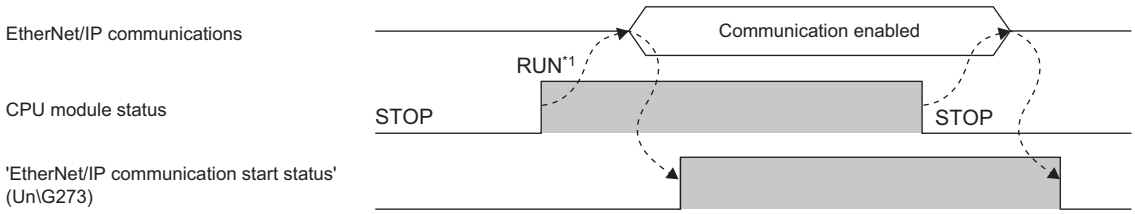
Set using the buffer memory of the FX5-EIP.

| 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).

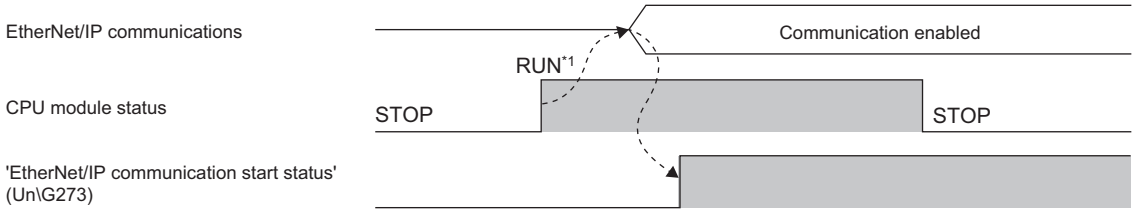
## Timing chart

- To stop EtherNet/IP communication




*1 When the CPU module starts running after it stops, the EtherNet/IP communications will start.

- To continue EtherNet/IP communication




*1 When the CPU module starts running after it stops, the EtherNet/IP communications will start.

# 4.6 EtherNet/IP Communication Automatic Start Function

## Function overview

With this function, EtherNet/IP communications can be started without using a program when the programmable controller is powered off and on or the CPU module changes from STOP to RUN.

When not using this function, a program that sets a value other than 0 (start request) for 'EtherNet/IP communication start request' (Un\G272) is required to start EtherNet/IP communications.

## 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 as 'EtherNet/IP communication start request' (Un\G272) and communication start automatically.
However, buffer memory operation changes depending on the value set as 'EtherNet/IP communication continuation specification request' (Un\G272).
The following table shows the relationship related to EtherNet/IP communication automatic start with respect to each buffer memory area.

• 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 16 (continue)) is set. |
| | | Value other than 16 (stop) | 16 (start request) is set. | 2 (operating with Value other than 16 (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 Value other than 16 (stop)) | 16 (continue) | 16 (start request) is set. | 1 (operating with 16 (continue)) is set. |
| | | | Value other than 16 (stop) | 16 (start request) is set. | 2 (operating with Value other than 16 (stop)) is set. |
| | | 1 (operating with 16 (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 Value other than 16 (stop)) | — | 0 (stop request) is set. | The status does not change. |
| | | 1 (operating with 16 (continue)) | — | The status does not change. (Remains set to 16 (start request).) | The status does not change. |

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

*2 Since it does not stop when the CPU module changes from RUN to STOP, communication will not stop unless 'EtherNet/IP communication start request' (Un\G272) is manually set to 0 (stop request).
In addition, if communication is stopped manually, it is necessary to manually set 'EtherNet/IP communication start request' (Un\G272) to 16 (start request) to restart communication.

# 4.7 Assurance of input/output data

The data received from EtherNet/IP devices and the data sent 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 send (UCMMOriginator_MessageSend)
- Class3 instance communication message send (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 send 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, send and receive data may be delayed.

# 4.8 General-purpose 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 send a request message to the external device. Only 3E frame is supported.

| Instruction | Description |
|---|---|
| GP.SLMPSND | Sends 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

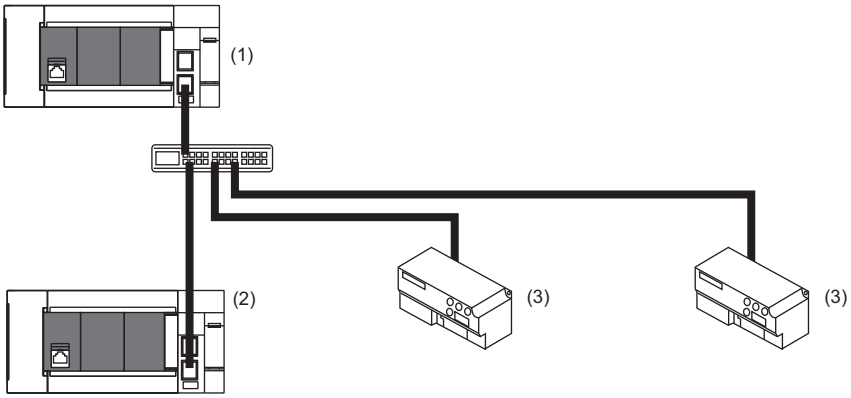
For details on the IP address change function, refer to the following.

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 separated 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.<br>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.<br>Devices that have a connection of target can be operated as the adapter. |

## 5.2 General-purpose Ethernet Communication Configuration

For details on the system configuration of general-purpose 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)

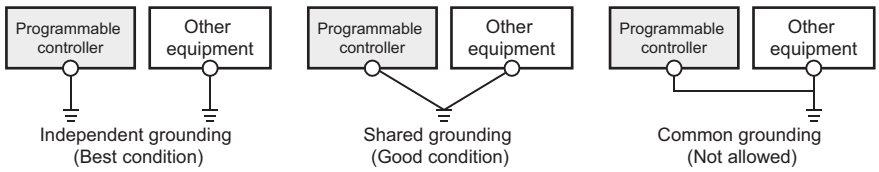
# MEMO

# 6 WIRING

## 6.1 Grounding

Perform the following.

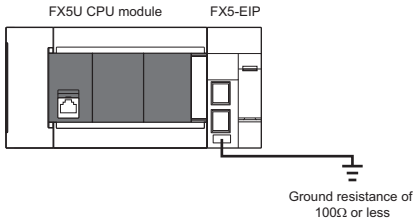
- Provide grounding with a ground resistance of 100Ω or less.
- Ground the programmable controller independently when possible.
- If the programmable controller cannot be grounded independently, provide the "Shared grounding" shown below.




- 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 | Content |
|---|---|
| ⏚ 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 shows 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 the product other than referenced products is used, the wire ferrule cannot be removed. Sufficiently confirm 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 | AI 0.25-8 YE | 0.25mm$^2$ | CRIMPFOX 6 |
| | | AI 0.34-8 TQ | 0.3, 0.34mm$^2$ | |
| | | AI 0.5-8 WH | 0.5mm$^2$ | |
| | | AI 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$^2$ | |
| | | AI 1.0-8 | 1.0mm$^2$ | |
| | | AI 1.5-7 | 1.25, 1.5mm$^2$ | |

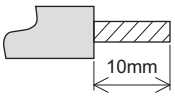
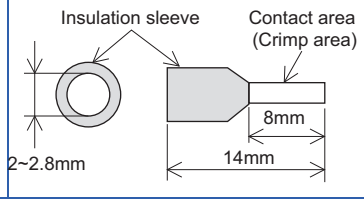
The wires to connect the spring clamp terminal block are described below.

| No. of wire per terminal | Wire size | | |
|---|---|---|---|
| | Single wire, strand wire | Ferrule with insulation sleeve | Ferrule without insulation sleeve |
| One wiring | 24 to 16 AWG<br>(0.2 to 1.5mm$^2$) | 24 to 18 AWG<br>(0.25 to 0.75mm$^2$) | 24 to 16 AWG<br>(0.25 to 1.5mm$^2$) |

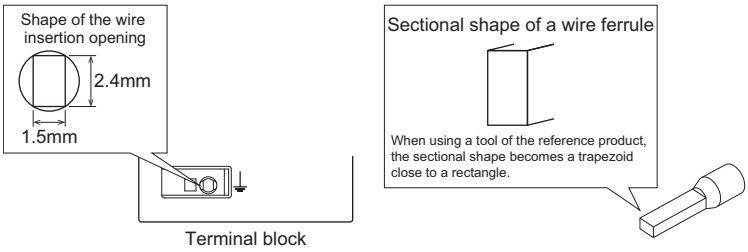
## ■Wire end treatment

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 it may take 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, the cable may swing, drag or be carelessly pulled, and the module or cable may be damaged, or cable contact failure may cause malfunction.
- 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 and disconnecting it. Pulling the cable connected to the module may result in damage to the module or the cable or 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 |

### ■General-purpose 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/cross cable can be used.

**Point**

Depending on the connection environment, communication errors may occur due to high-frequency noise from devices other than programmable controllers. The following describes precautionary measures to be taken on the FX5-EIP to avoid the influence of high-frequency noise.

[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 necessary for EtherNet/IP and general-purpose 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]

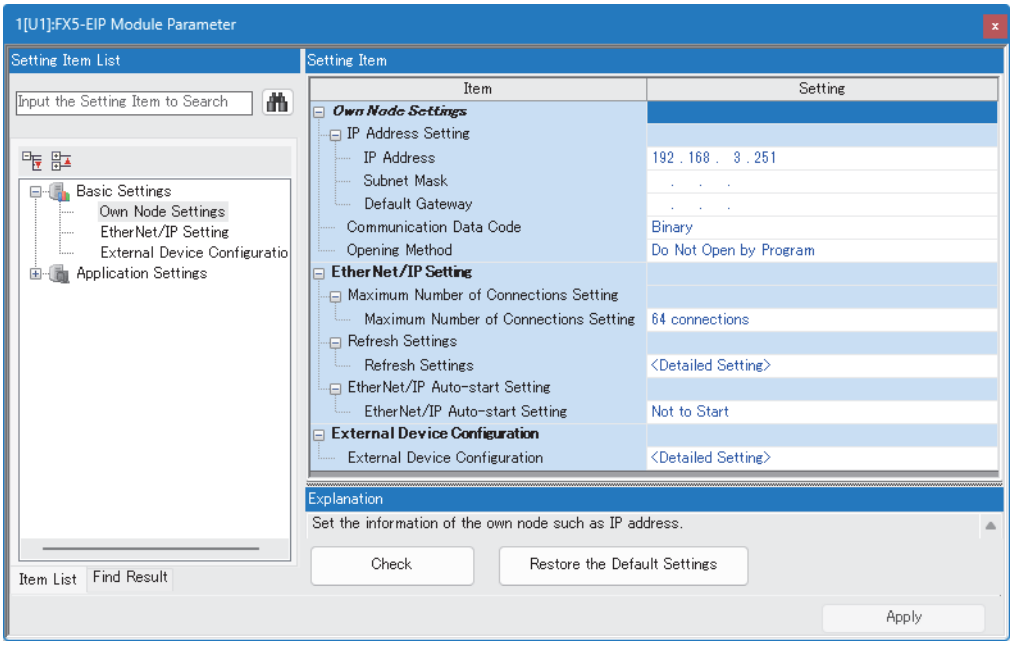
***5.*** The settings are reflected by resetting the CPU module or powering off and on the system.

*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]




## 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<br>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. | • Empty (Default)<br>• 0.0.0.1 to 223.255.255.254*2 |
| | Subnet Mask | Set the subnet mask of the FX5-EIP.<br>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.<br>The subnet mask setting is not required for communication in a single network. | • Empty (Default)<br>• 0.0.0.1 to 255.255.255.255*3 |
| | Default Gateway | Set the default gateway of the FX5-EIP.<br>Set the IP address of the relay device (default gateway) to access the EtherNet/IP device in another network.<br>■Setting conditions<br>• The class of the IP address is A, B, or C.<br>• The subnet address of the default gateway is the same as that of the FX5-EIP.<br>• The host address part is not a sequence of "0" or "1". | • Empty (Default)<br>• 0.0.0.1 to 223.255.255.254 |
| Communication Data Code | | Select the format of the data to be used for communication. | • Binary (Default)<br>• ASCII (X, Y OCT)<br>• ASCII (X, Y HEX) |
| Opening Method | | Select how to open a connection.<br>• 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.<br>• Open by Program: Select this item to perform open/close processing and open/close the connection by a program. | • Do Not Open by Program (Default)<br>• 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).<br>The maximum communication data size changes depending on the maximum number of connections. (☞ Page 91 Maximum Number of Connections Setting) | • 64 connections (Default)<br>• 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. | • Not to Start (Default)<br>• 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

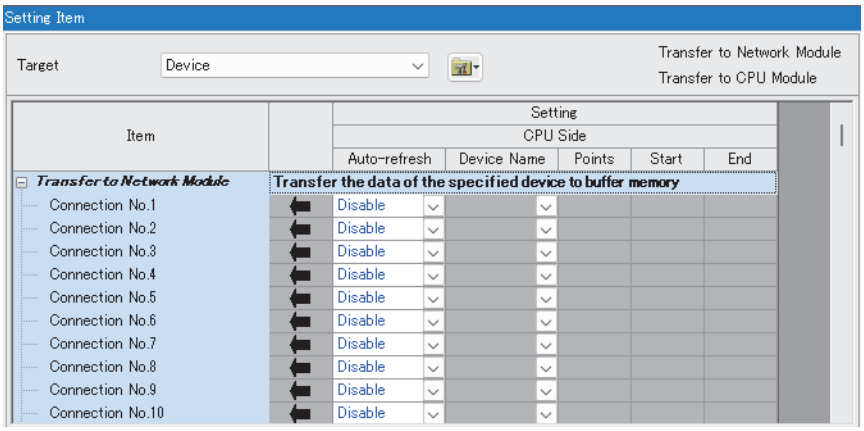
☞ Page 99 EtherNet/IP Configuration

Since the address of the data area also changes, review the program as well when the buffer memory address is directly referred to 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. | • Disable (Default)<br>• Enable |
| Device Name | Set the CPU device to be refreshed. | ■Transfer to Network Module<br>• Empty (Default)<br>• Y, M, L, B, D, W, R<br>■Transfer to CPU Module<br>• Empty (Default)<br>• X, M, L, B, D, W, R |
| Points | Set the number of points to be refreshed in decimal.<br>(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.<br>(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 send/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 sent.
- 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.

**Point**

Data inconsistency in send/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 150μs × the number of connections.

*1 This data size applies when both T → O and O → T are refreshed in Exclusive Owner.

## Precautions

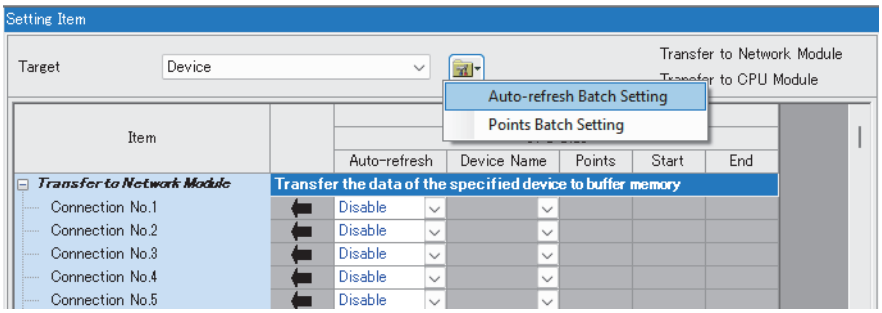
When data is transferred to a CPU module, the refresh processing is not performed if the input data for the corresponding connection has not changed since the previous transfer. Therefore, the refresh processing time may increase or decrease depending on the update frequency of input data. Set the constant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

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

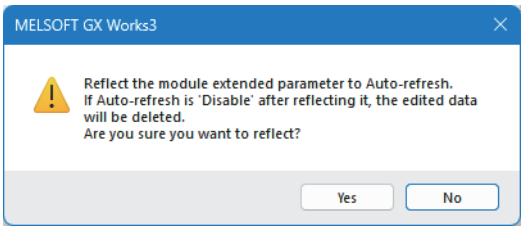
Data inconsistency in send/receive data can be prevented using "Auto-refresh".

The setting method is described below.

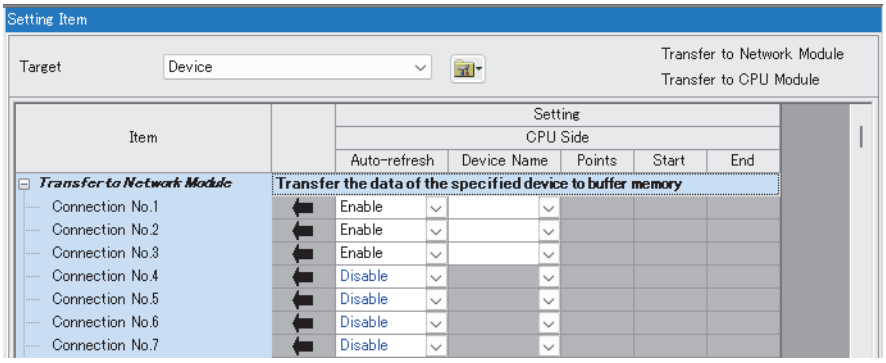
***1.*** Select "Auto-refresh Batch Setting" from the toolbox while the refresh target is set to "Device".



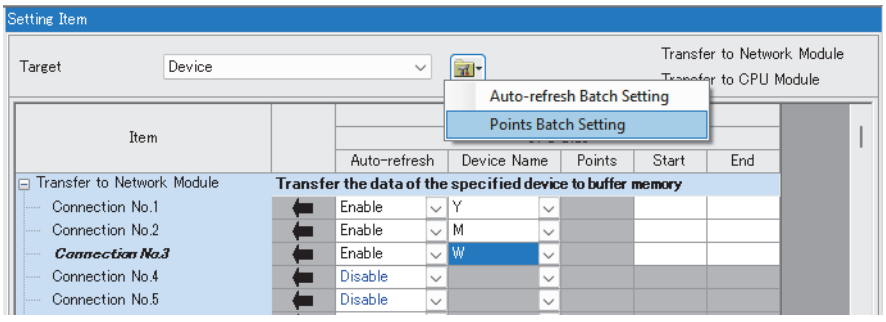

***2.*** When the confirmation dialog appears, click the [Yes] button.



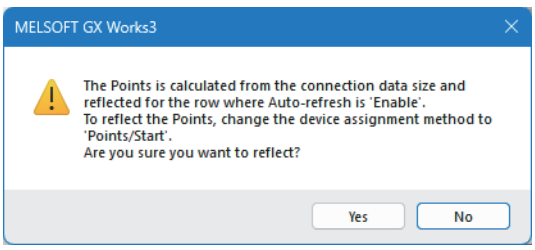

***3.*** By using "Auto-refresh Batch Setting", connection data which is available for auto refresh is read from "EtherNet/IP Configuration" and is reflected to "Auto-refresh".



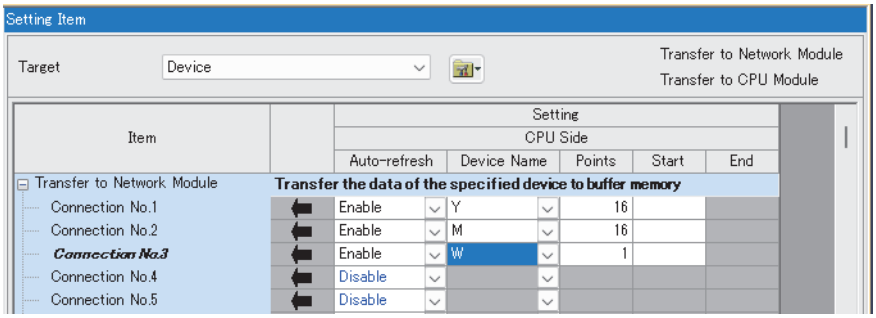

***4.*** Set "Device Name" and select [Points Batch Setting] from the toolbox.




***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".




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

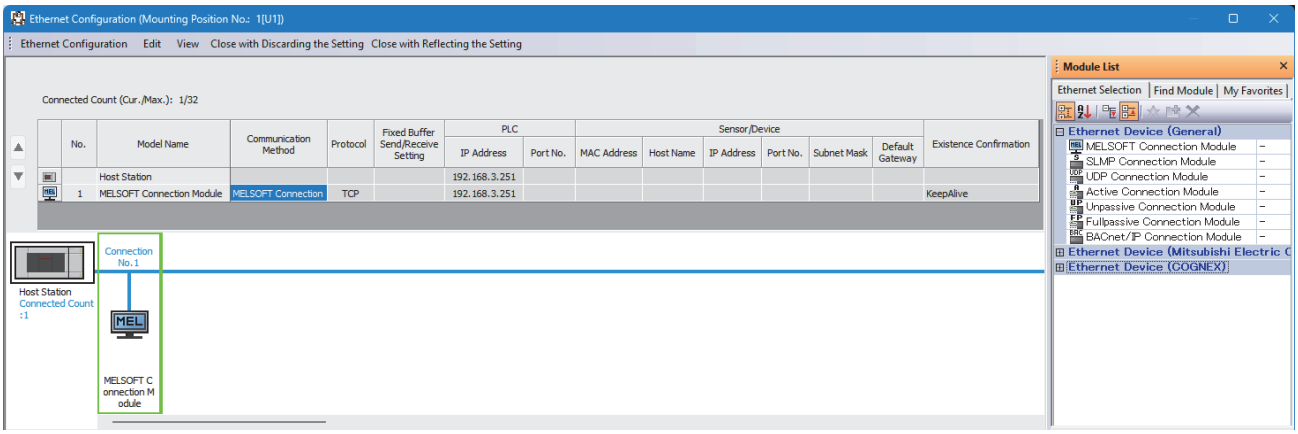
**Point**

- 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 | • MELSOFT Connection<br>• SLMP<br>• Socket Communication |
| Protocol | | Select the communication protocol for the external device.*1 | • TCP<br>• UDP |
| Fixed Buffer Send/Receive Setting | | Not supported. | — |
| PLC | IP Address | The IP address of the host station (FX5-EIP) is displayed. | — |
| | Port No. | Set the port number of the host station (FX5-EIP). | • Empty (Default)<br>• 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. | • Empty (Default)<br>• 0.0.0.1 to 223.255.255.254 |
| | Port No. | Set the port number of the external device. | • Empty (Default)<br>• 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 Ethernet-equipped 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 | • KeepAlive<br>• Do not confirm existence |

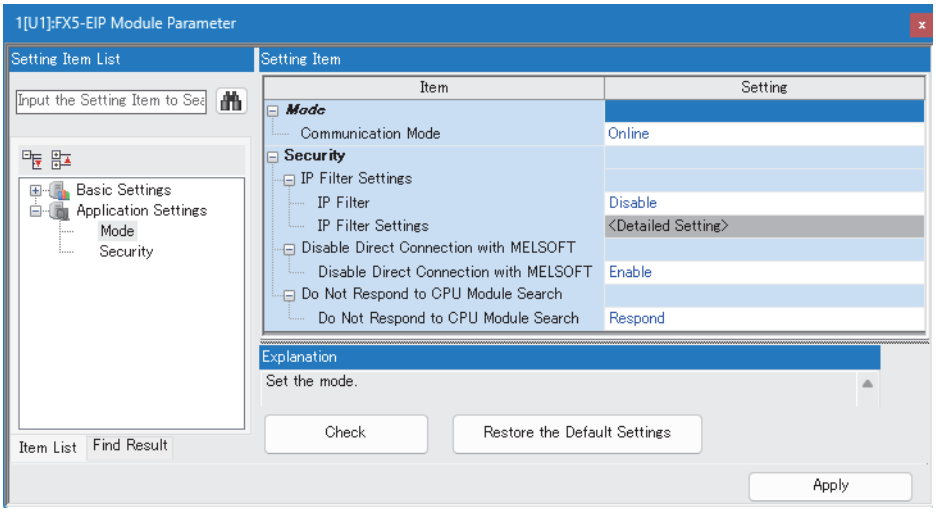
*1 Automatically set by the "Ethernet Device".
The protocol can be selected only when "Communication Method" is "SLMP".

*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.<br>• Online: Normal operation mode<br>• 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) | • Online (Default)<br>• Hardware test |

**Restriction**

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

## Security

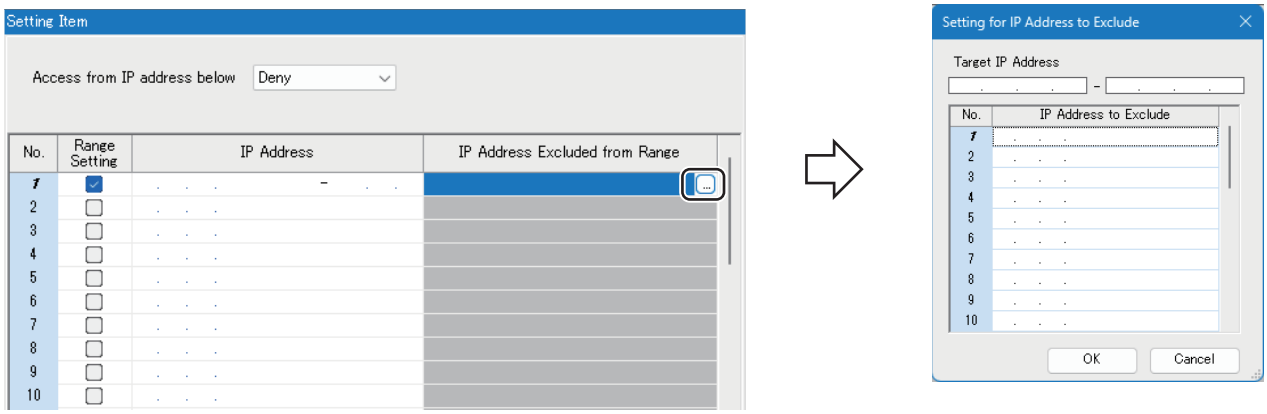
Set the security function.

| Item | | Description | Setting range |
|---|---|---|---|
| IP Filter Settings | IP Filter | Set whether to enable the IP filter function. | • Disable (Default)<br>• 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. | • Disable<br>• Enable (Default) |
| Do Not Respond to CPU Module Search | | Set whether to respond to search for the CPU modules on the network. | • Do Not Respond<br>• 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".




| Item | Description | Setting range |
|---|---|---|
| Access from IP address below | Select whether to allow or deny the access from the specified IP addresses. | • Allow (Default)<br>• Deny |
| Range Setting | Select this item when specifying the IP addresses by range. | — |
| IP Address | Set the IP address to be allowed or denied.<br>When selecting "Range Setting", enter the start IP address (left field) and end IP address (right field) of the range. | • Empty (Default)<br>• 0.0.0.1 to 223.255.255.254 |
| IP Address Excluded from Range | When selecting "Range Setting", set the IP address to be excluded from the set range.<br>Up to 32 IP addresses can be set. | • Empty (Default)<br>• 0.0.0.1 to 223.255.255.254 |

# 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

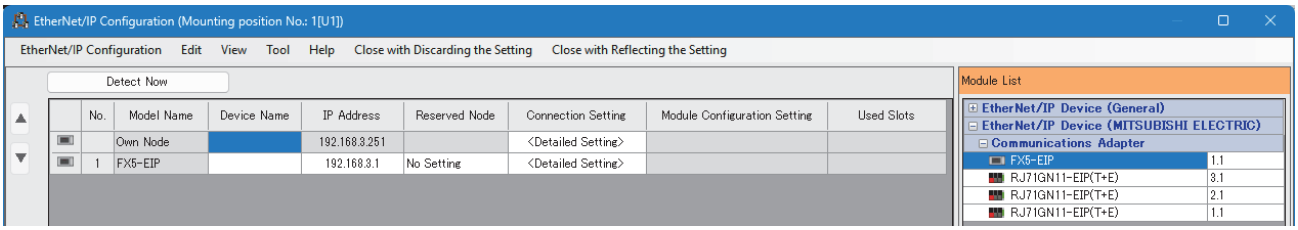
### Common settings

#### ■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.

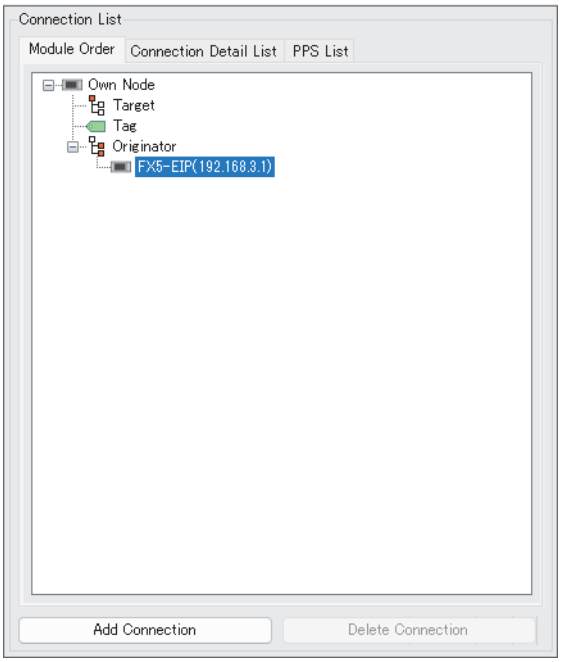
## Setting the Class1 instance communications

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

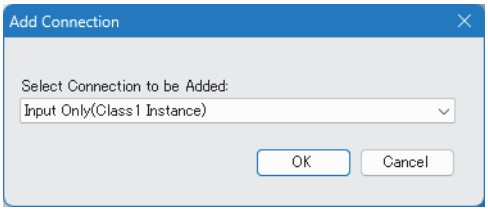
### ■When the FX5-EIP is set as an originator

**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.

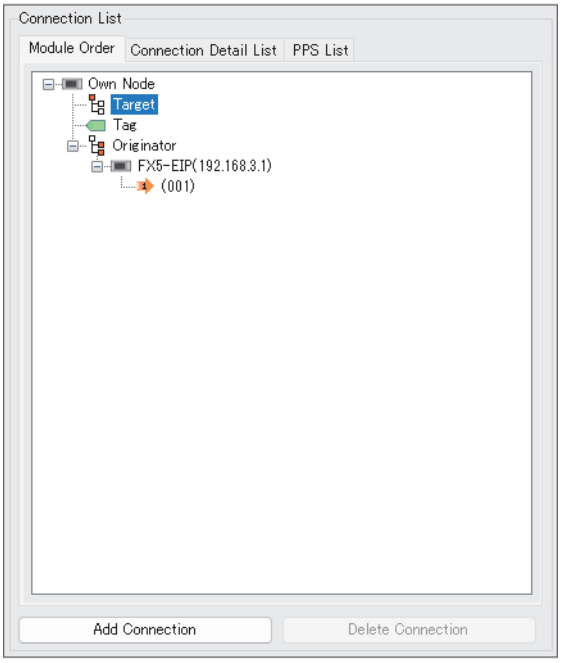
**5.** Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

### ■When the FX5-EIP is set as a target

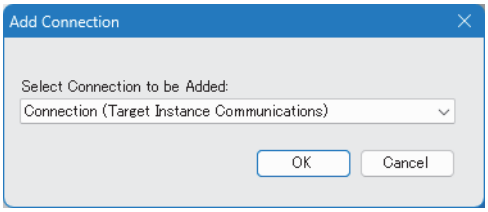
1. Double-click <Detailed Setting> in the "Connection Setting" column in the "EtherNet/IP Configuration" window, and open the connection of the EtherNet/IP device.

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. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

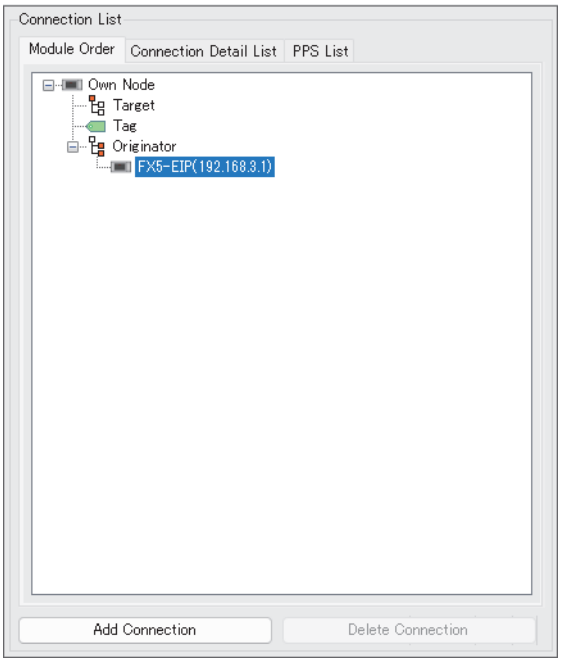
## Setting the Class1 tag communications

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

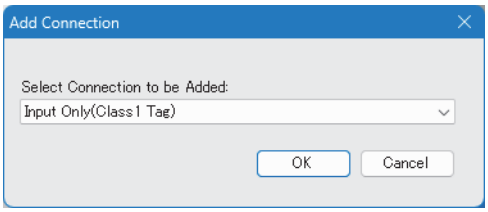
### ■When the FX5-EIP is set as an originator

**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.

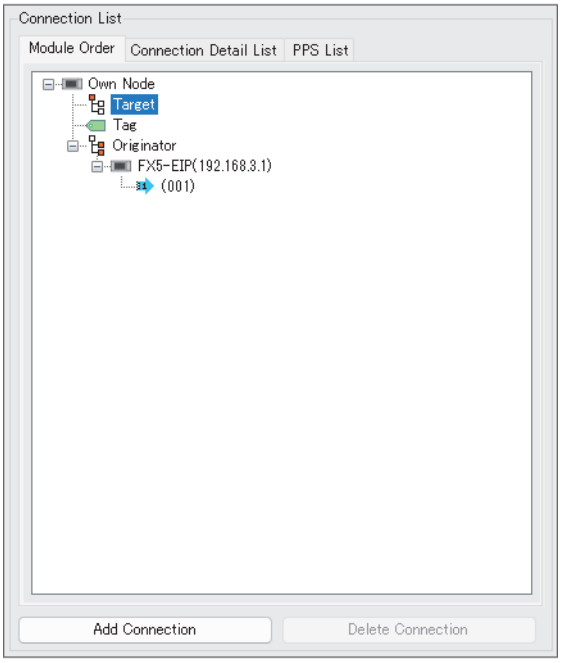
**5.** Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

### ■When the FX5-EIP is set as a target

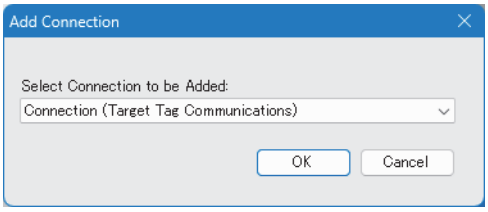
1. Double-click <Detailed Setting> in the "Connection Setting" column in the "EtherNet/IP Configuration" window, and open the connection of the EtherNet/IP device.

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. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

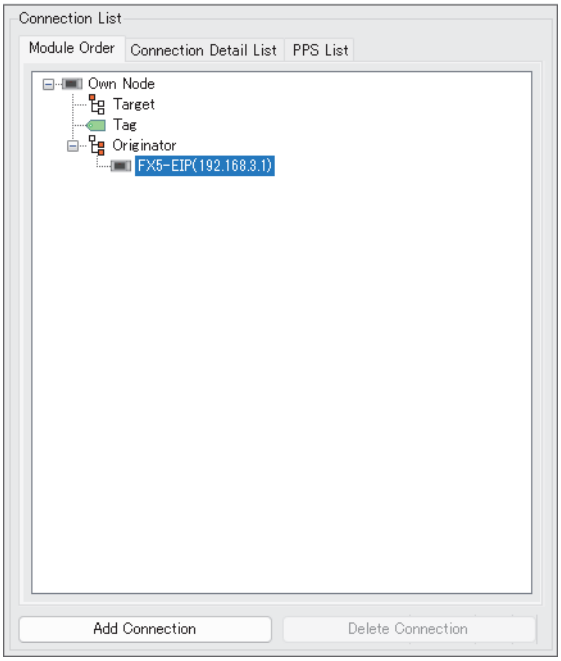
## Setting the Class3 instance communications

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

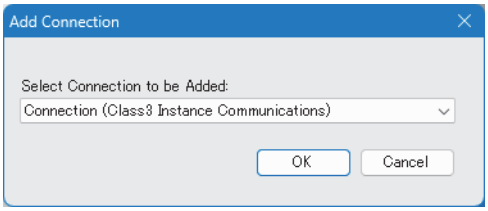
Set Class3 instance communications only when the own station operates as a client.

***1.*** Configure the settings to send 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.

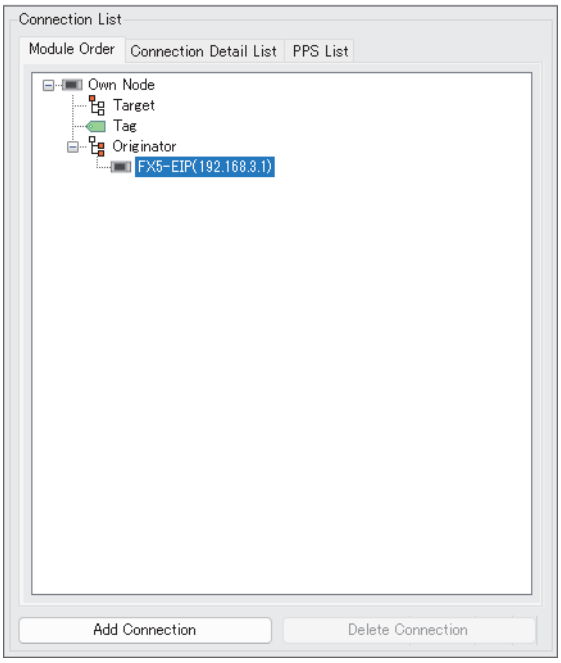
***5.*** Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

## Setting the Class3 tag communications

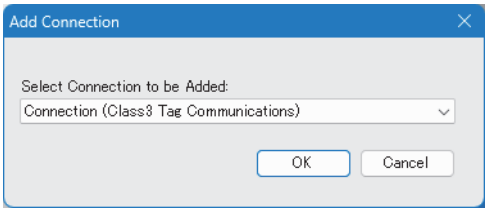
To perform Class3 tag communications for the EtherNet/IP device, follow the procedure below.

**1.** Configure the settings to send 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)

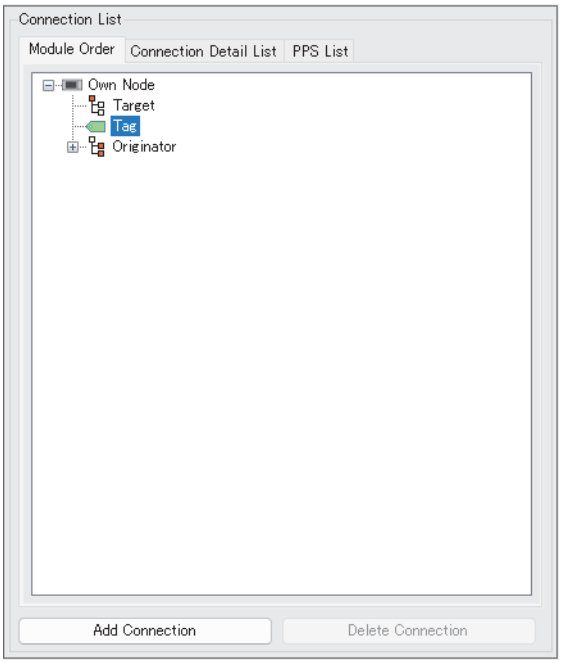
**4.** Click the [OK] button to reflect the parameters.

**5.** Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

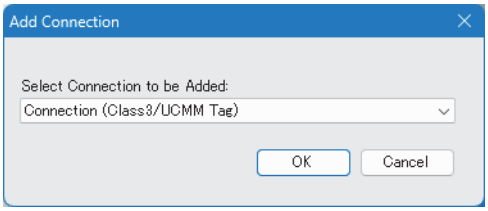
## Setting the Class3/UCMM tags

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.

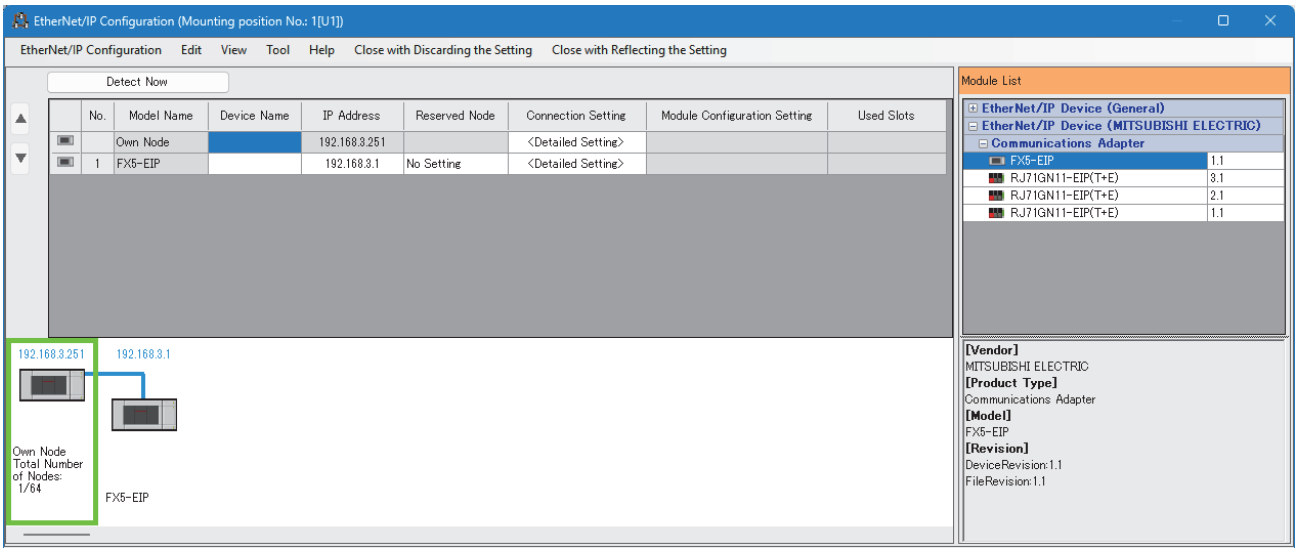



4. Set the parameter for the UCMM tag communications in "Connection Detailed Setting". (☞ Page 112 Tag: Class3/UCMM tag)
5. Click the [OK] button to reflect the parameters.
6. Select [Close with Reflecting the Setting] and close the "EtherNet/IP Configuration" window.

# 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.<br>• No Setting: The EtherNet/IP device is connected to the network.<br>• 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. | • No Setting (Default)<br>• 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". | — |

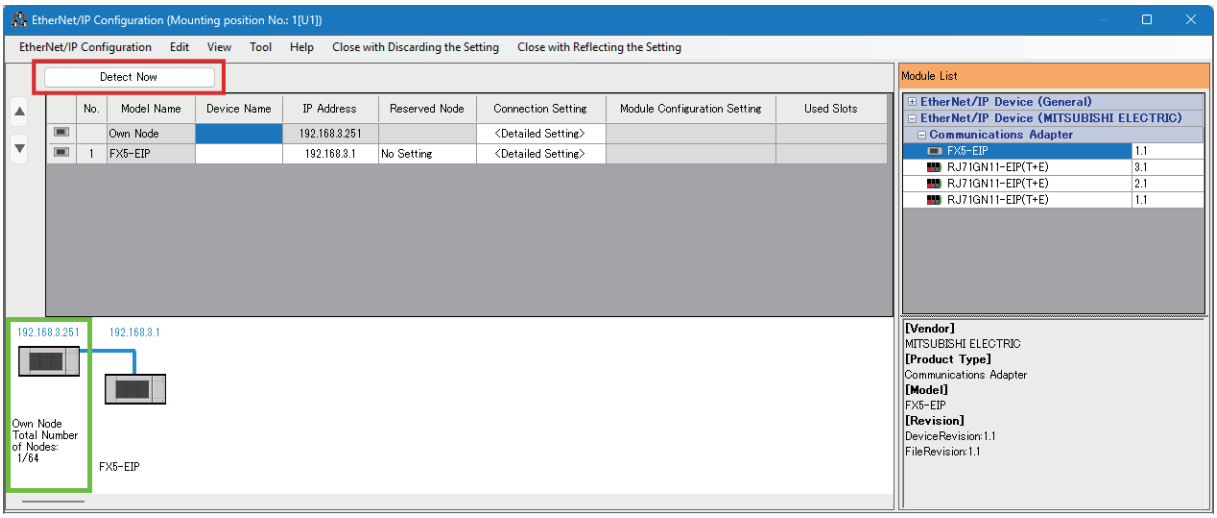
## Automatic detection of EtherNet/IP devices

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 makes it easier to set parameters when a network system is set up or the network system 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.<br>• Module parameter<br>• 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.<br>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).
· 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.

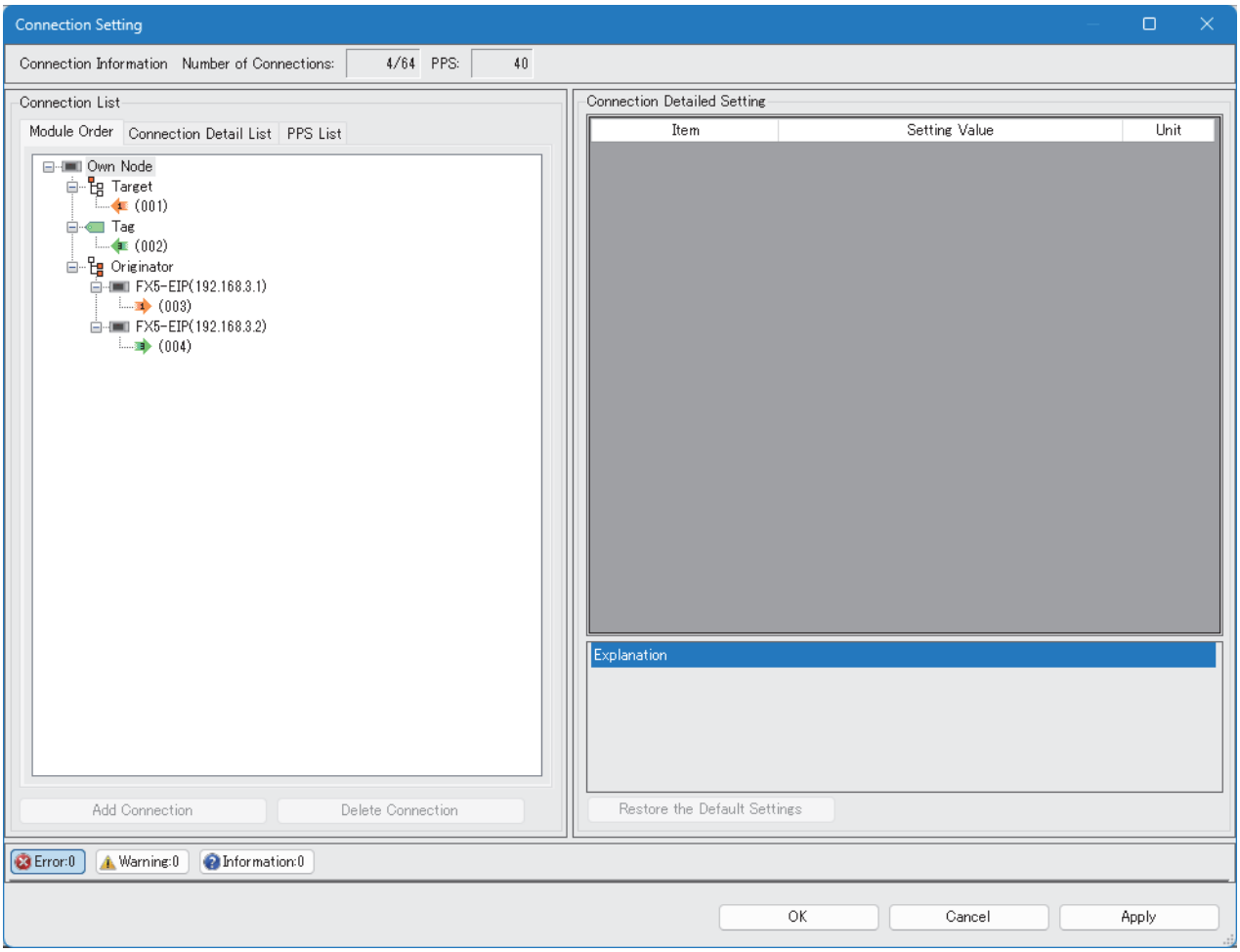
To check if an external device can respond to the ListIdentity command, refer to the manual of that device.

### ■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 past the 128th are not displayed in the detection results. Because detection is done 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.

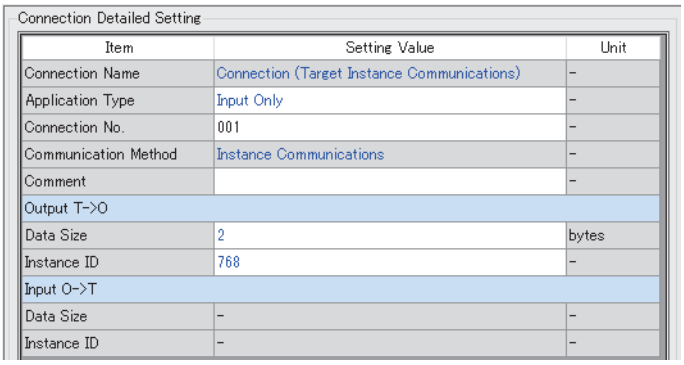



| Item | | Description |
|---|---|---|
| Connection List | Module Order | Displays the list of connections. The module order, connection detail list, or communication processing performance (PPS) list can be switched by clicking a corresponding tab.<br>Select an item and click the [Add Connection] button to display the "Add Connection" window.<br>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 made 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.<br>• Class1 instance communications<br>• Class1 tag communications | Manages the connection settings when the own node is used as a server (a target).<br>• UCMM tag communications<br>• 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.<br>• Class1 instance communications<br>• Class1 tag communications<br>• Class3 instance communications<br>• Class3 tag communications |

## ■Target: Instance communications




| Item | | Description | Setting range |
|---|---|---|---|
| Connection Name | | Displays the connection name. | — |
| Application Type | | Set the application type. | • Input Only (Default)<br>• Exclusive Owner |
| Connection No. | | Set the connection number.<br>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)<br>This item can be set only when "Application Type" is set to "Exclusive Owner". | 1 to 1444*2 |
| | Instance ID | Set the instance ID.<br>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 |

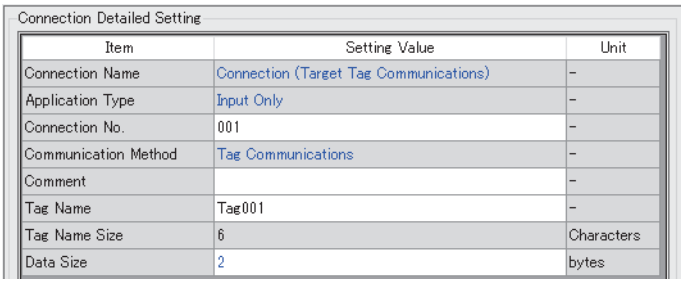
*1 When the maximum number of connections is set to 128, the setting range is from 1 to 128.

*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

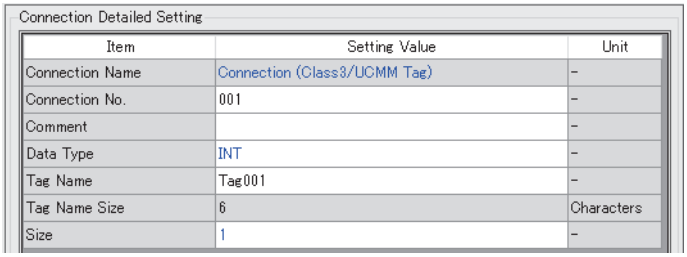
| Item | Setting Value | Unit |
|---|---|---|
| Connection Name | Connection (Target Tag Communications) | - |
| Application Type | Input Only | - |
| Connection No. | 001 | - |
| Communication Method | Tag Communications | - |
| Comment | | - |
| Tag Name | Tag001 | - |
| Tag Name Size | 6 | Characters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

| Item | Description | Setting range |
|---|---|---|
| Connection Name | Displays the connection name. | — |
| Application Type | Displays the application type.<br>For the tag communication, only InputOnly can be set. | — |
| Connection No. | Set the connection number.<br>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.<br>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

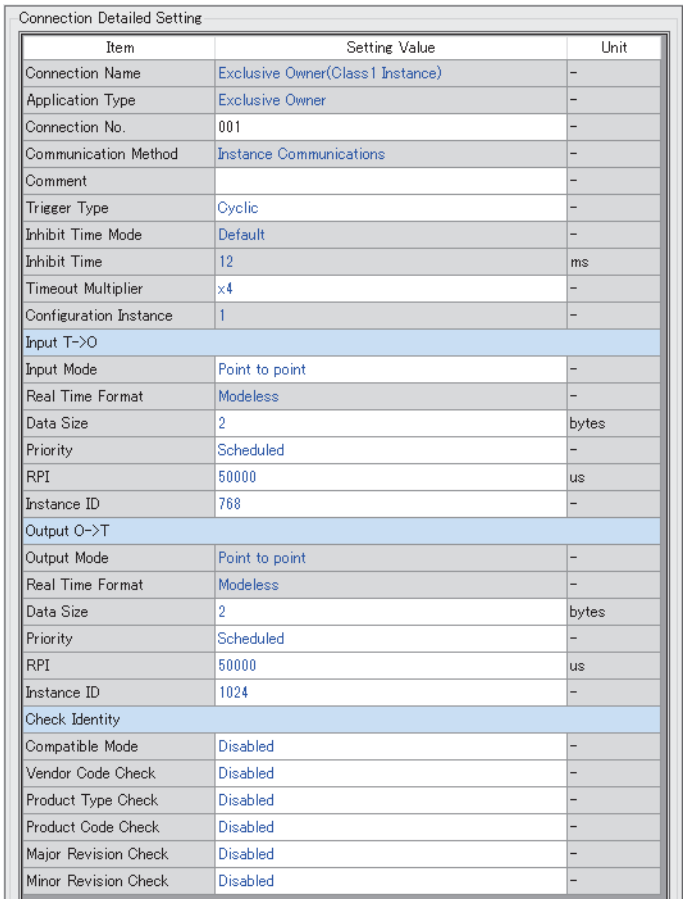
| Item | Setting Value | Unit |
|---|---|---|
| Connection Name | Connection (Class3/UCMM Tag) | - |
| Connection No. | 001 | - |
| Comment | | - |
| Data Type | INT | - |
| Tag Name | Tag001 | - |
| Tag Name Size | 6 | Characters |
| Size | 1 | - |

| Item | Description | Setting range |
|---|---|---|
| Connection Name | Displays the connection name. | — |
| Connection No. | Set the connection number.<br>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. | • INT (Default)<br>• DINT |
| Tag Name | Set the tag name. The default name is set as "Tag" + the numerical value of the connection number.<br>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).<br>The size setting range depends on the setting of "Data Type". | • For INT: 1 to 249<br>• 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.<br>The name of the connection selected in the connection selection window when adding the connection is displayed. | — |
| Application Type | Displays the application type.<br>Any type in the setting range is displayed according to the selection of the connection selection window when adding the connection. | • Input Only<br>• Exclusive Owner<br>• Listen Only |
| Connection No. | Set the connection number.<br>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 sending.<br>For details on each trigger type, refer to the following.<br>☞ Page 28 Trigger type | • Cyclic (Default)<br>• Change of State<br>• Application Trigger |
| Inhibit Time Mode | Set the mode of the transmission inhibit time (minimum delay time) until transmission.<br>This item can be set only when "Trigger Type" is set to "Change of State" or "Application Trigger".<br>• Default: 1/4 of "RPI" of Output (O->T) is used as "Inhibit Time". However, if the value exceeds 255ms, 255ms is used.<br>• Un-Activated: 0ms is used as "Inhibit Time".<br>• Custom: Enter a value directly in "Inhibit Time". | • Default (Default)<br>• Un-Activated<br>• Custom |
| Inhibit Time | Set the transmission inhibit time (minimum delay time) until transmission. (Unit: ms)<br>This item can be set only when "Inhibit Time Mode" is set to "Custom".<br>If "Inhibit Time Mode" is set to "Default", automatic calculation will be performed. | 1 to 255 |

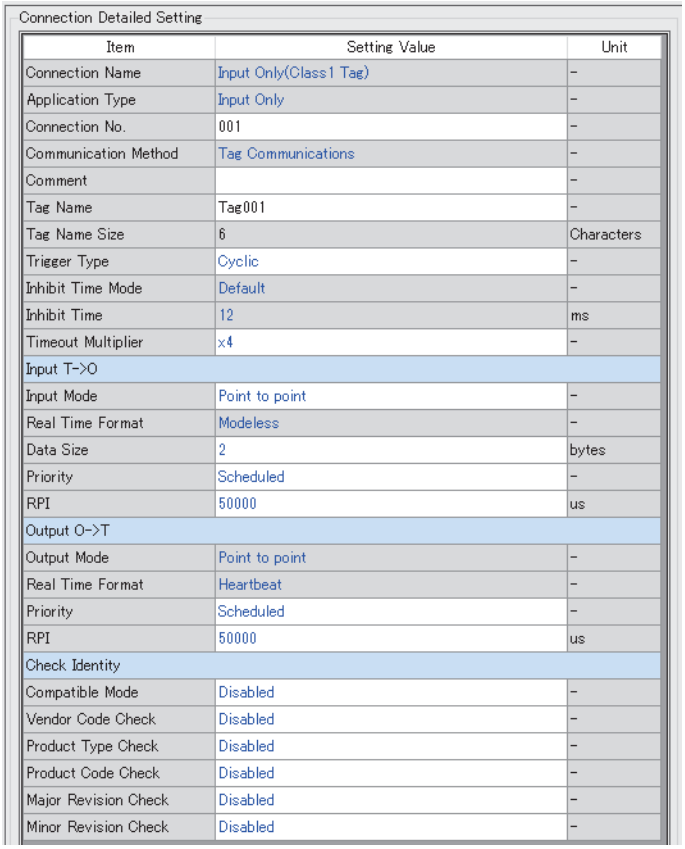
| Item | | Description | Setting range |
|---|---|---|---|
| Timeout Multiplier | | Set the timeout multiplier. | • ×4 (Default)<br>• ×8<br>• ×16<br>• ×32<br>• ×64<br>• ×128<br>• ×256<br>• ×512 |
| Configuration Instance | | Obtains and displays the following values for the EDS file.<br>• Connection Manager section<br>• Connection entry<br>• Path field | — |
| Input T->O | Input Mode | Set the transmission mode for packets containing input data.<br>• Multicast: Multicast (one to many) communications are performed.<br>• Point to point: Unicast (one to one) communications are performed. | • Multicast<br>• Point to point |
| | Real Time Format | Displays the realtime format. | — |
| | Data Size | Set the data size to be sent from the target to the originator. (Unit: bytes) | 1 to 1444*2 |
| | Priority | Set the priority of the connection. | • Low<br>• High<br>• Scheduled (Default)<br>• 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 sent from the originator to the target. (Unit: bytes)<br>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. | • Low<br>• High<br>• Scheduled (Default)<br>• 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. | • Disabled (Default)<br>• Enabled |
| | Vendor Code Check | Set whether or not to check the vendor code.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Product Type Check | Set whether or not to check the product type.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Product Code Check | Set whether or not to check the product code.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Major Revision Check | Set whether or not to check the major revision.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Minor Revision Check | Set whether or not to check the minor revision.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• 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.



Connection Detailed Setting

| 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 | - |

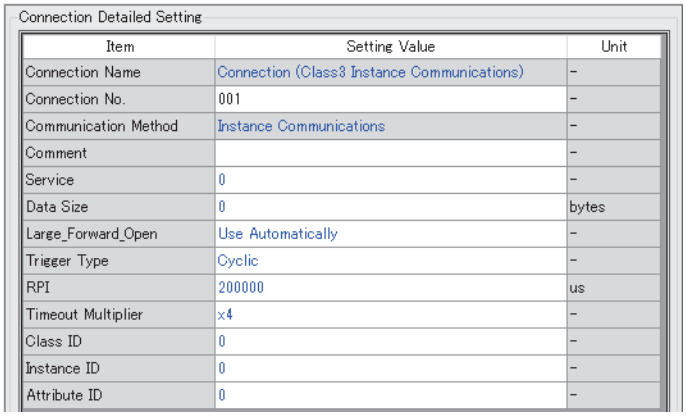
| Item | Description | Setting range |
|---|---|---|
| Connection Name | Displays the connection name. | — |
| Application Type | Displays the application type. | — |
| Connection No. | Set the connection number.<br>The default value is the minimum value from the unused connection numbers in the connection 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.<br>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 sending.<br>For details on each trigger type, refer to the following.<br>☞ Page 28 Trigger type | • Cyclic (Default)<br>• Change of State<br>• Application Trigger |
| Inhibit Time Mode | Set the mode of the transmission inhibit time (minimum delay time) until transmission.<br>This item can be set only when "Trigger Type" is set to "Change of State".<br>• Default: 1/4 of "RPI" of Output (O->T) is used as "Inhibit Time". However, if the value exceeds 255ms, 255ms is used.<br>• Un-Activated: 0ms is used as "Inhibit Time".<br>• Custom: Enter a value directly in "Inhibit Time". | • Default (Default)<br>• Un-Activated<br>• Custom |
| Inhibit Time | Set the transmission inhibit time (minimum delay time) until transmission. (Unit: ms)<br>This item can be set only when "Inhibit Time Mode" is set to "Custom".<br>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. | • ×4 (Default)<br>• ×8<br>• ×16<br>• ×32<br>• ×64<br>• ×128<br>• ×256<br>• ×512 |
| Input T->O | Input Mode | Set the transmission mode for packets containing input data.<br>• Multicast: Multicast (one to many) communications are performed.<br>• Point to point: Unicast (one to one) communications are performed. | • Multicast<br>• Point to point |
| | Real Time Format | Displays the realtime format. | — |
| | Data Size | Set the data size to be sent from the target to the originator. (Unit: bytes) | 1 to 1444 |
| | Priority | Set the priority of the connection. | • Low<br>• High<br>• Scheduled (Default)<br>• 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. | • Low<br>• High<br>• Scheduled (Default)<br>• Urgent |
| | RPI | Set the requested packet interval (RPI). (Unit: 500μs) | 2000 to 60000000 |
| Check Identity | Compatible Mode | Enables or disables compatible mode. | • Disabled (Default)<br>• Enabled |
| | Vendor Code Check | Set whether or not to check the vendor code.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Product Type Check | Set whether or not to check the product type.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Product Code Check | Set whether or not to check the product code.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Major Revision Check | Set whether or not to check the major revision.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• Enabled |
| | Minor Revision Check | Set whether or not to check the minor revision.<br>This item is fixed to "Enabled" if "Compatible Mode" is set to "Enabled". | • Disabled (Default)<br>• 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.

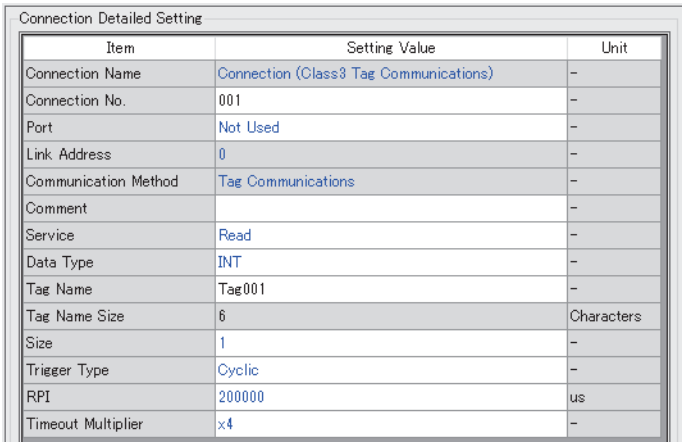



| Item | Description | Setting range |
|---|---|---|
| Connection Name | Displays the connection name. | — |
| Connection No. | Set the connection number.<br>The default value is the minimum value from the unused connection numbers in the connection list. | 1 to 64*1 |
| Communication Method | Displays 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.<br>In the following cases, select "Use Always".<br>• Performing Class3 communications using Large_Forward_Open is required in the manual of the server device used.<br>• The size of response data from the server device is expected to be 512 bytes or larger.<br>• Responses from the server device are the following error codes.<br>General Status: 23h<br>CIP Status Name: Buffer Overflow | • Use Automatically (Default)<br>• Use Always |
| Trigger Type | Set the trigger type to be used in combination with "RPI" to control the timing of data sending.<br>• Cyclic: Class3 messages are sent periodically according to "RPI".<br>• Application Trigger: Class3 messages are sent according to the request from the client (own station). | • Cyclic (Default)<br>• Application Trigger |
| RPI | Set the requested packet interval (RPI). (Unit: 1000μs) | 200000 to 60000000 |
| Timeout Multiplier | Set the timeout multiplier. | • ×4 (Default)<br>• ×8<br>• ×16<br>• ×32<br>• ×64<br>• ×128<br>• ×256<br>• ×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.



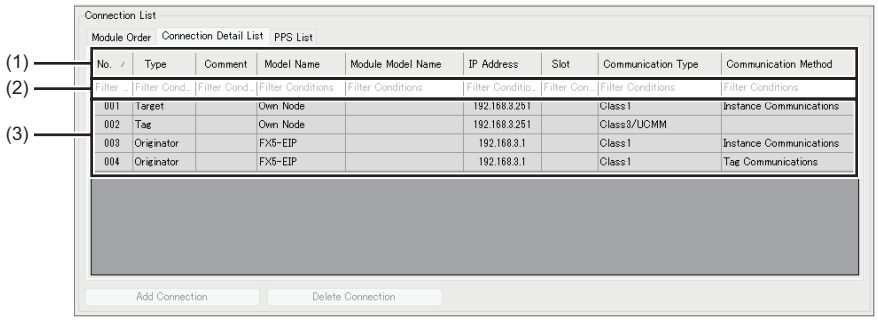

| Item | Description | Setting range |
|---|---|---|
| Connection Name | Displays the connection name. | — |
| Connection No. | Set the connection number.<br>The default value is the minimum value from the unused connection numbers in the connection list. | 1 to 64*1 |
| Port | Set the port. | • Not Used (Default)<br>• 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. | • Read (Default)<br>• Write |
| Data Type | Set the data type for the tag. | • INT (Default)<br>• DINT |
| Tag Name | Set the tag name. The default name is set as "Tag" + the numerical value of the connection number.<br>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).<br>The size setting range depends on the settings of "Data Type", "Service", and "Tag Name Size Characters". | • For INT:<br>Read: 1 to 248<br>Write: 1 to 246— (number of tag name characters/2)*2<br>• For DINT:<br>Read: 1 to 124<br>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 sending.<br>• Cyclic: Class3 messages are sent periodically according to "RPI".<br>• Application Trigger: Class3 messages are sent according to the request from the client (own station). | • Cyclic (Default)<br>• Application Trigger |
| RPI | Set the requested packet interval (RPI). (Unit: 1000μs) | 200000 to 60000000 |
| Timeout Multiplier | Set the timeout multiplier. | • ×4 (Default)<br>• ×8<br>• ×16<br>• ×32<br>• ×64<br>• ×128<br>• ×256<br>• ×512 |

*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

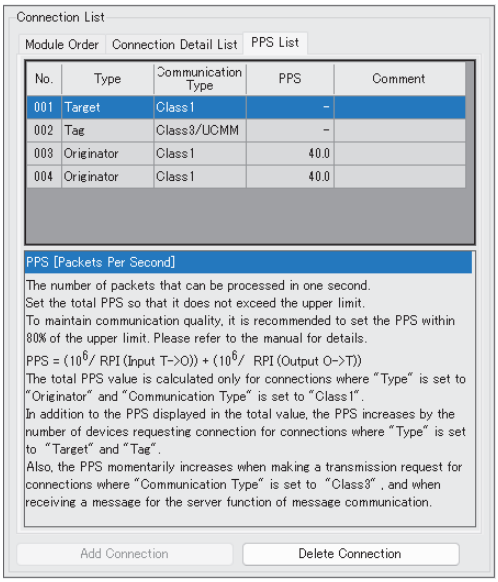
This tab displays the list of the details on each connection.




| No. | 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.<br>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.<br>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.




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**

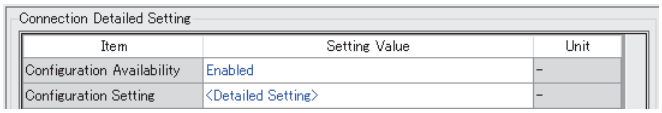
Right-click a connection with PPS displayed, and from the pop-up window, select [Move to RPI (Input (T->O))] or [Move to RPI (Output (O->T))] to move to the applicable location of the detailed connection settings.

## Configuration Setting

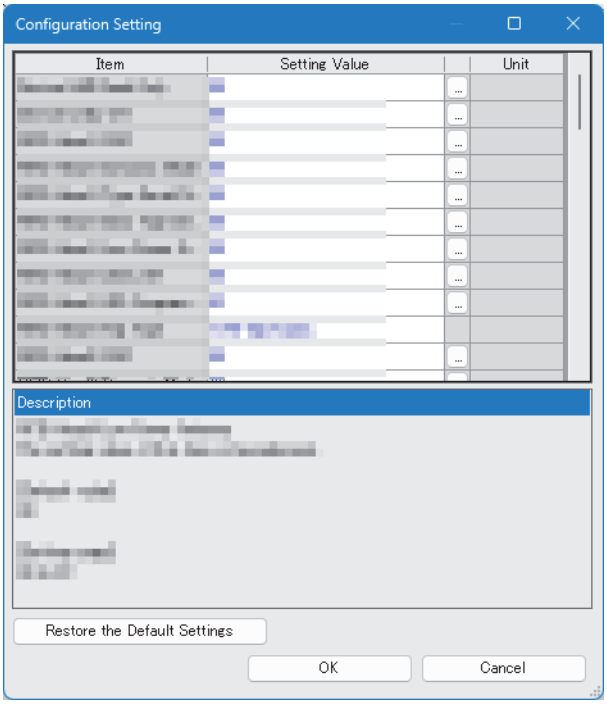
The configuration can be set in the connection detailed setting depending on the devices.

### Operating procedure

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




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




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


**Point**

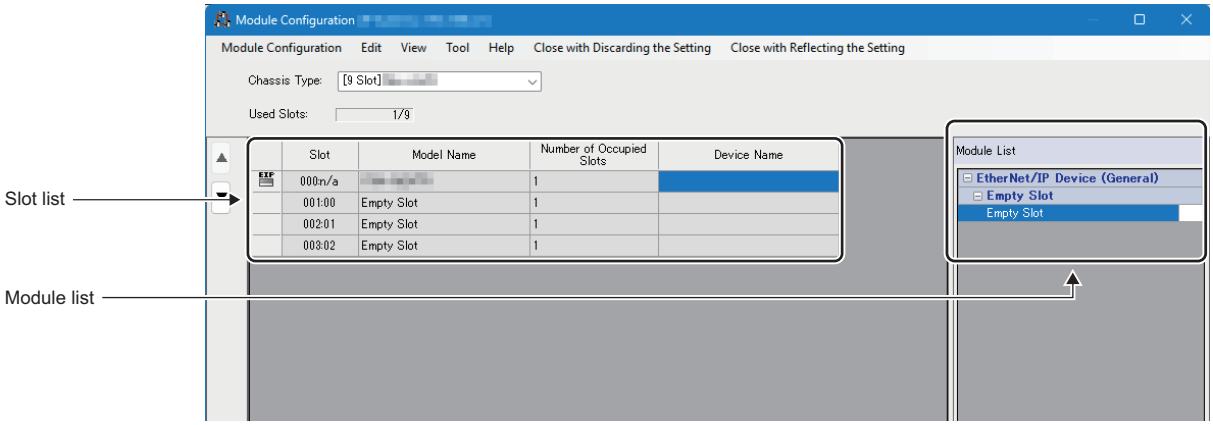
The displayed contents vary depending on the EDS files.

## 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. Select [Close with Reflecting the Setting] and 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

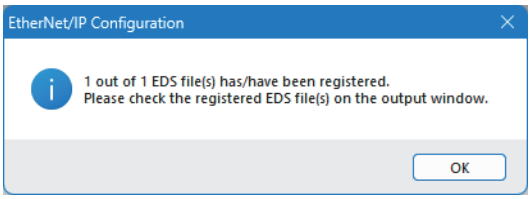
### ■Adding the EDS file

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.



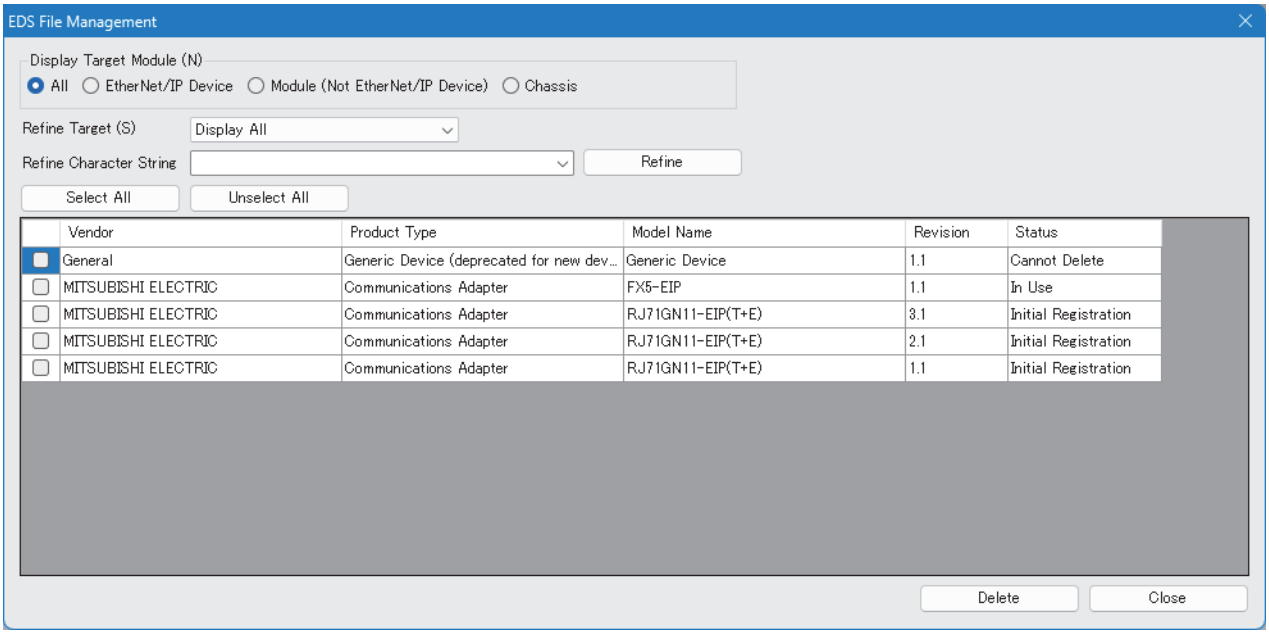

**Point**

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]




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<br>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<br>This status is displayed when a file deletion is completed. |
| Deleting Failed | An EDS file which failed to be deleted<br>This status is displayed when a file deletion fails even though the file deletion is attempted. |

**Point**

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 send data inconsistencies between the output data to be sent 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<br>Values are stored in order, starting from connection number 1. |
| • Output data size<br>• Message communication (server) data size | Un\G432 to Un\G559: Output/message communication (server) data size<br>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<br>Values are stored in order, starting from connection number 1.<br>The buffer memory address of the corresponding connection number in the input data area is stored as is. |
| • Output data buffer memory address<br>• Message communication (server) data buffer memory address | Un\G816 to Un\G1071: Output/message communication (server) data buffer memory address<br>Values are stored in order, starting from connection number 1.<br>The buffer memory address of the corresponding connection number in the output/message communication (server) data area is stored as is. |

**Point**

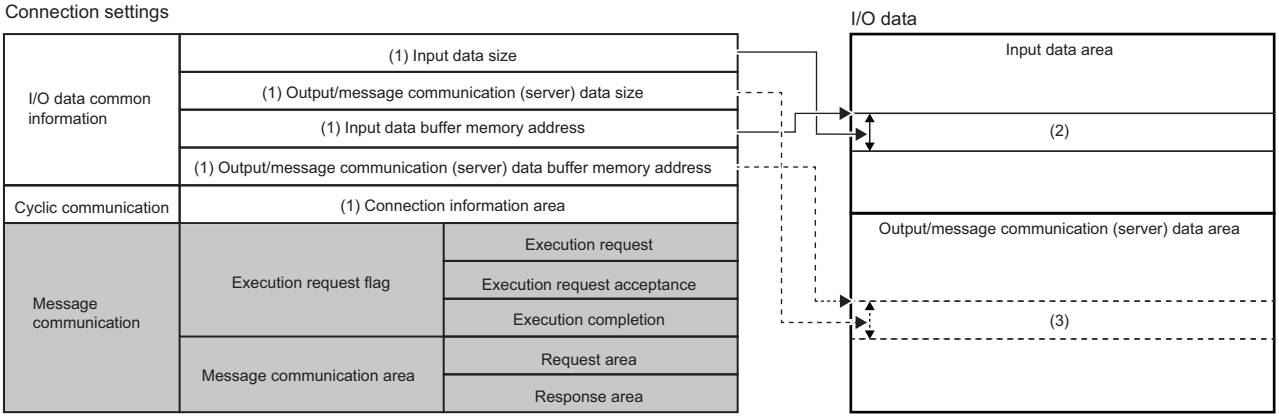
The buffer memory start addresses of "Input data area" and "Output/message communication (server) data area" change according to the maximum number of connections.
For differences in buffer memory layout depending on the maximum number of connections setting, refer to the following.
☞ Page 225 List of 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)



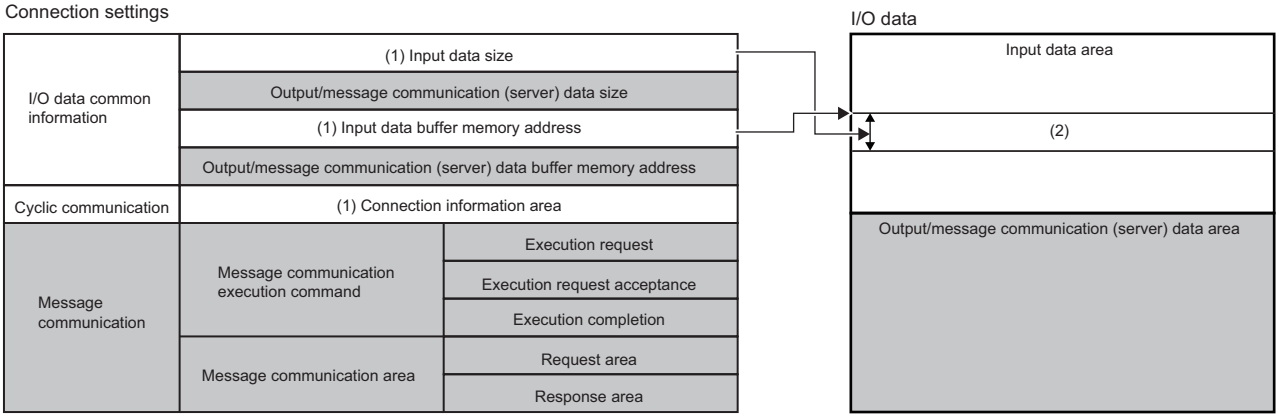

(1) Area where the parameter settings are automatically set
(2) Area where data received from the communication destination is stored
(3) Area to be set by the user in the program
Colored areas are not used.

- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- The input data sent 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 sent 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)



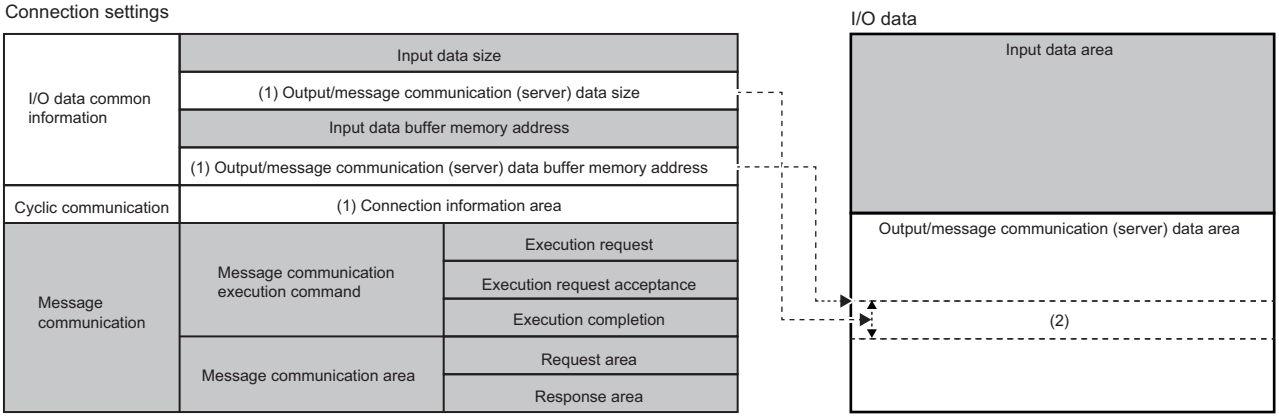

(1) Area where the parameter settings are automatically set
(2) Area where data received from the communication destination is stored
Colored areas are not used.

- In areas where the parameter settings are automatically set, the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- Input data sent 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)



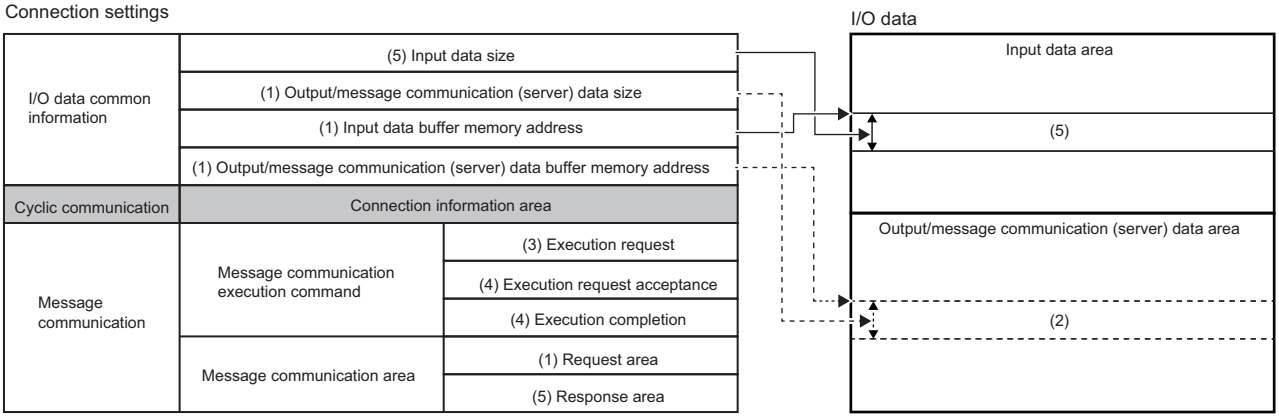

(1) Area where the parameter settings are automatically set
(2) Area to be set by the user in the program
Colored areas are not used.

- 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 sent 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.

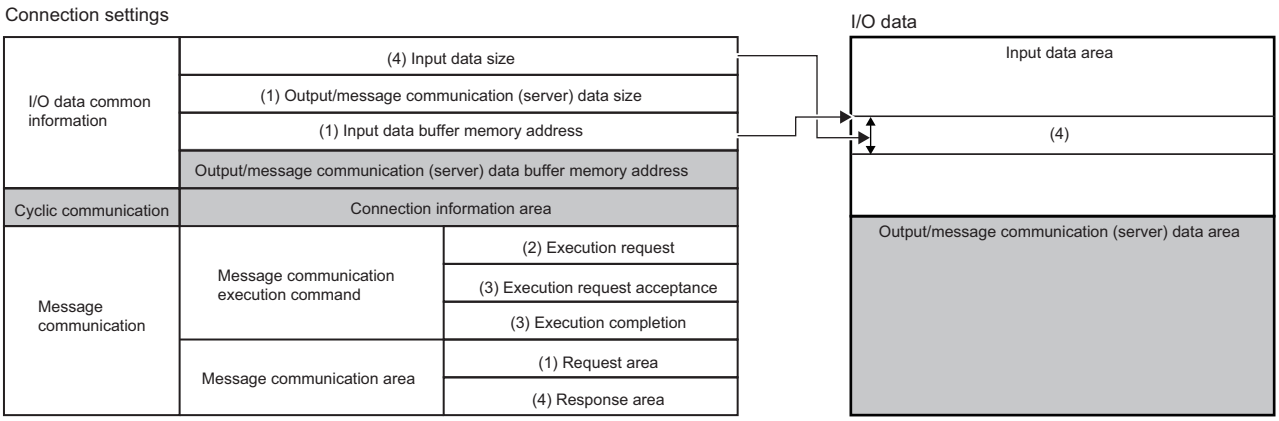
## For Class3 instance communications (client)




(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 sent 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)




(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.

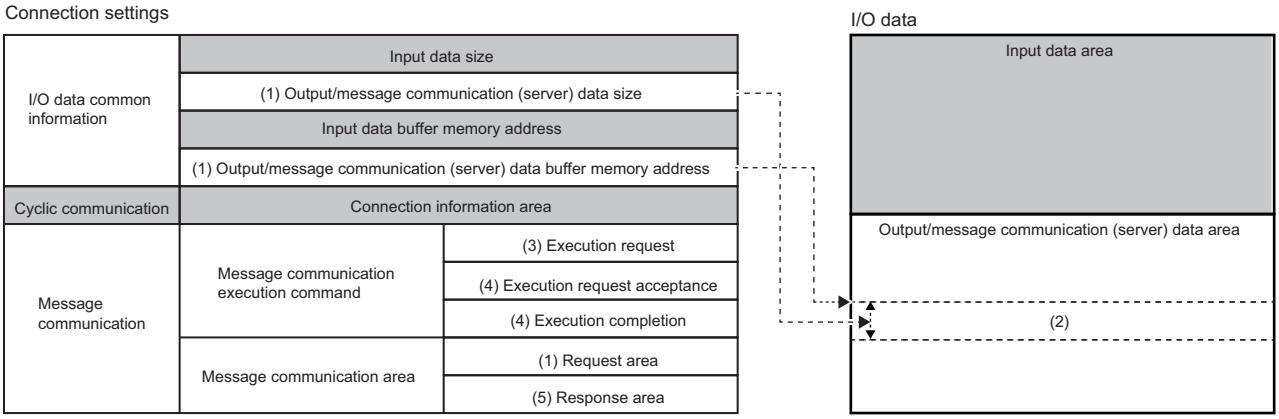
- In area (1), the FX5-EIP automatically stores values based on the "EtherNet/IP Configuration" settings.
- When the execution request is turned on in a program, communications start and execution request acceptance turns on.
- When a response is received from the server, execution completion turns on.
- 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.

**Point**

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

## For Class3 tag communications (client) (Write)

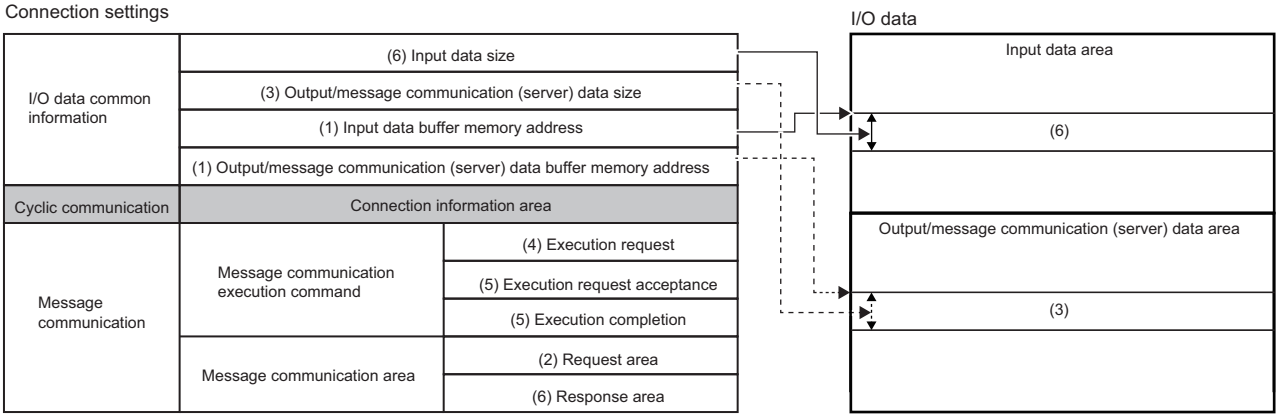
### ■For Class3 tag communications (client) (Write)




(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 sent 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)



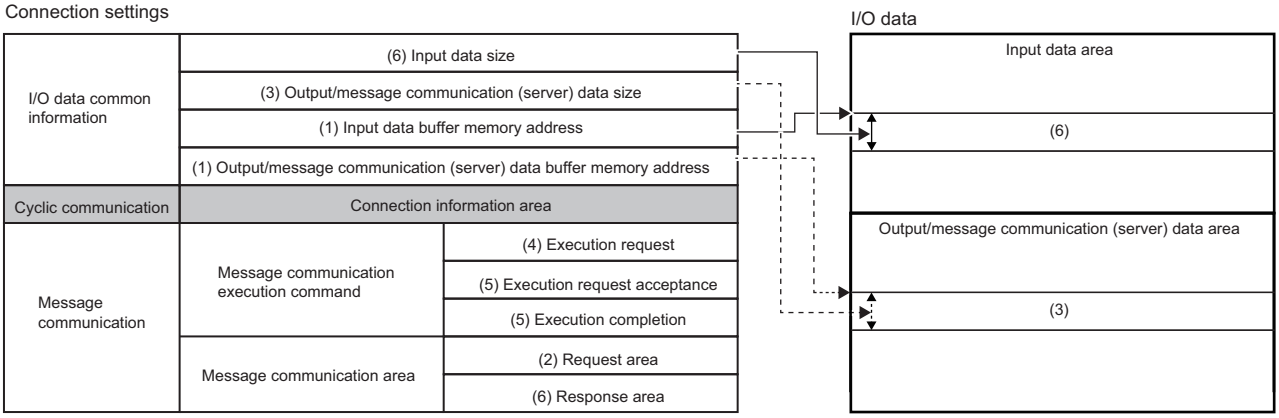

(1) Area where the parameter settings are automatically set
(2)(3)(4)Area to be set by the user in the program
(5) Area where the operating status is automatically updated
(6) Area where data received from the communication destination is stored
Colored areas are not used.

- 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 sent 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 method specification in the request area. Connections with the communication method specification set to 0001H can be used in the UCMM client function.

## For UCMM tag communications (client) (Read)



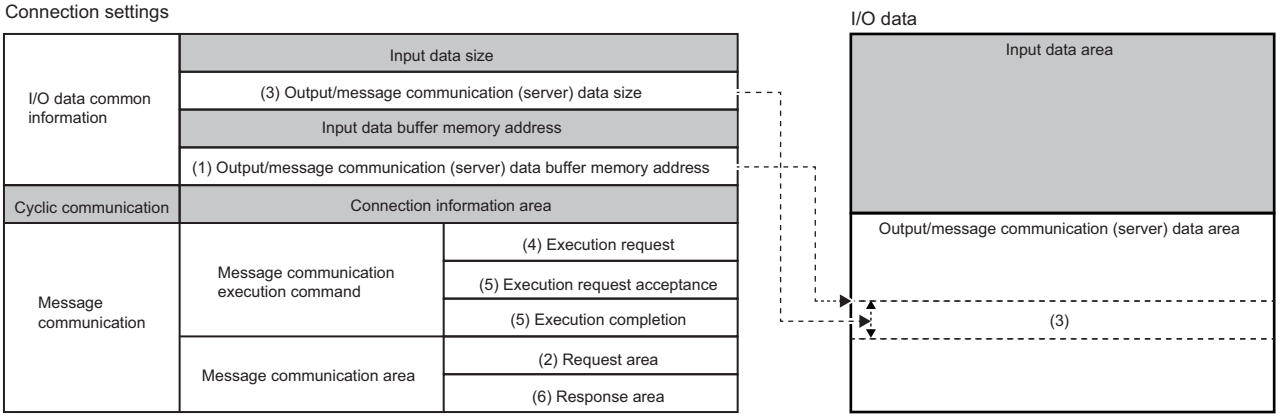

(1) Area where the parameter settings are automatically set
(2)(3)(4)Area to be set by the user in the program
(5) Area where the operating status is automatically updated
(6) Area where data received from the communication destination is stored
Colored areas are not used.

- 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 method specification in the request area. Connections with the communication method specification set to 0001H can be used in the UCMM client function.

## For UCMM tag communications (client) (Write)



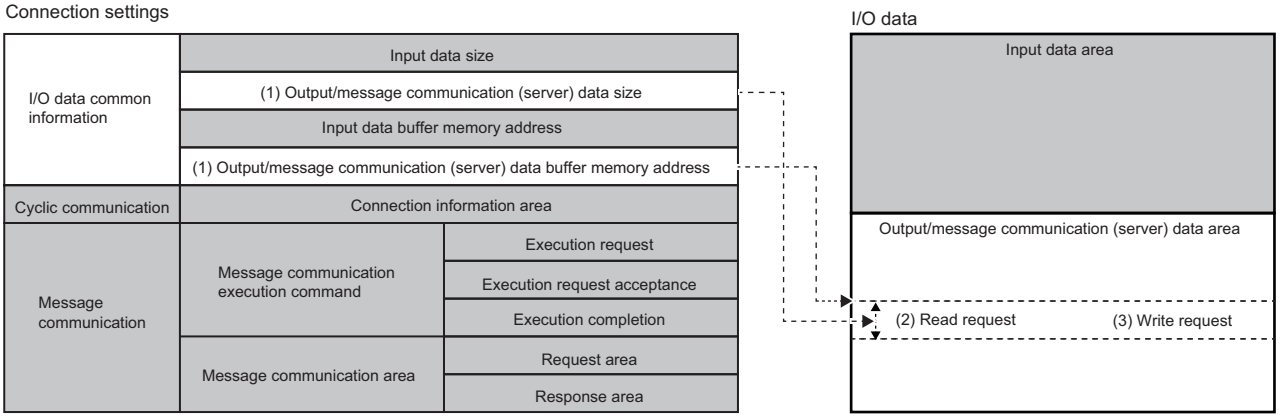

(1) Area where the parameter settings are automatically set
(2)(3)(4)Area to be set by the user in the program
(5) Area where the operating status is automatically updated
(6) Area where data received from the communication destination is stored
Colored areas are not used.

- 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 sent 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.

**Point**

At startup, the FX5-EIP automatically stores 0001H only for the communication method specification in the request area. Connections with the communication method specification set to 0001H can be used in the UCMM client function.

## For Class3/UCMM tag communications (server)




(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 sent 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.

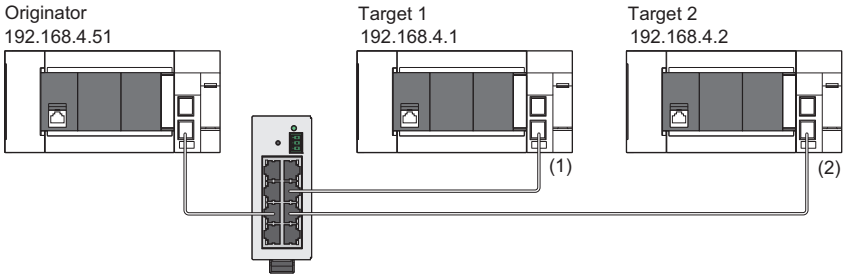
# 8.2 Cyclic Communications Communication Example

This section describes examples of executing cyclic communication between FX5-EIP modules.

## System configuration

The following system configuration is used to explain communication 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.

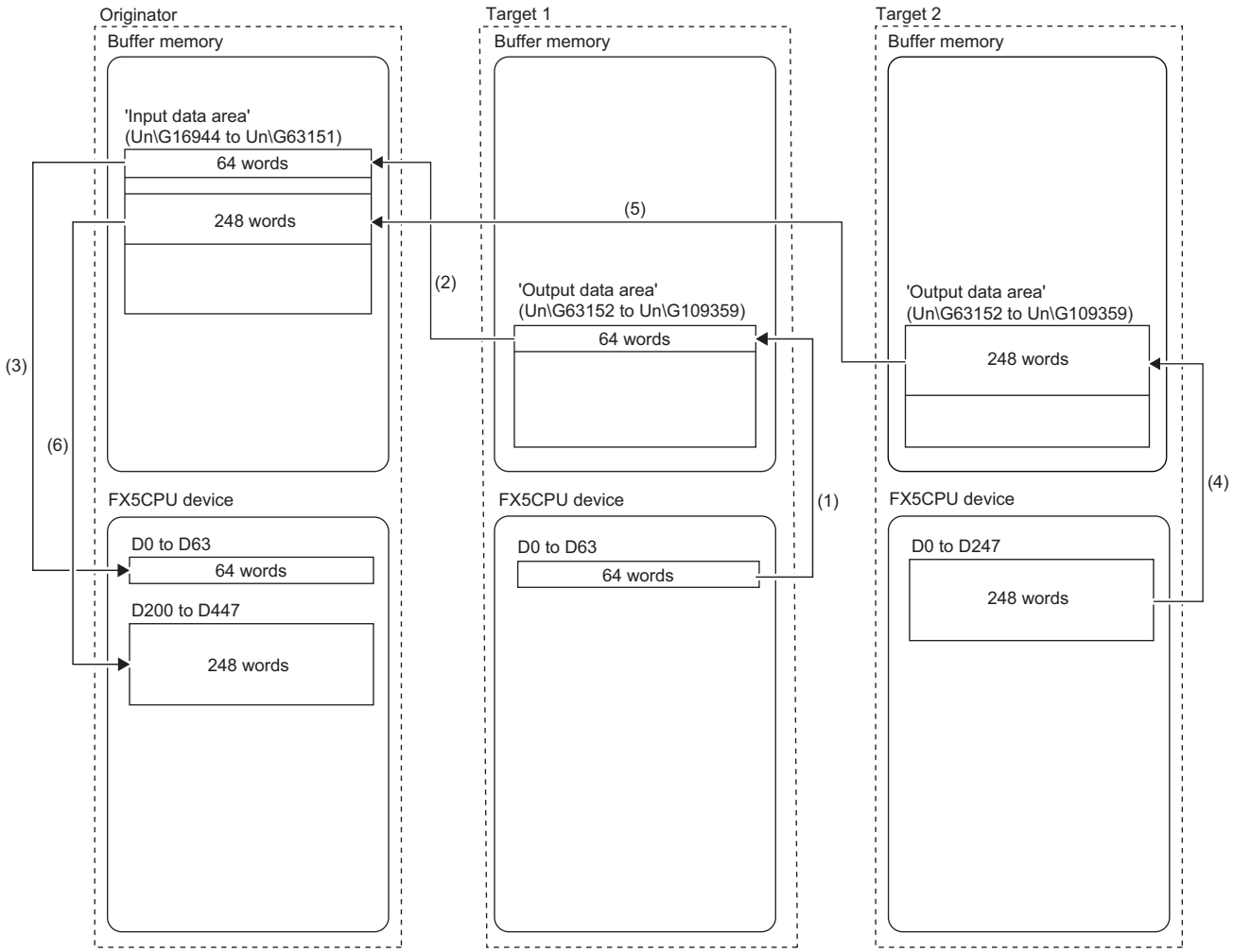



(1) Class1 instance communications between the originator and target 1
(2) Class1 tag communications between the originator and target 2

# Communication description

The following figure shows the relationships of buffer memory areas of the FX5-EIP with each target.

- Instance communications between the originator and target 1 use function blocks.
- Tag communications between the originator and target 2 use auto refresh.




(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 to Network Module | Transfer the data of the specified device to buffer memory | | | | | |
| 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**

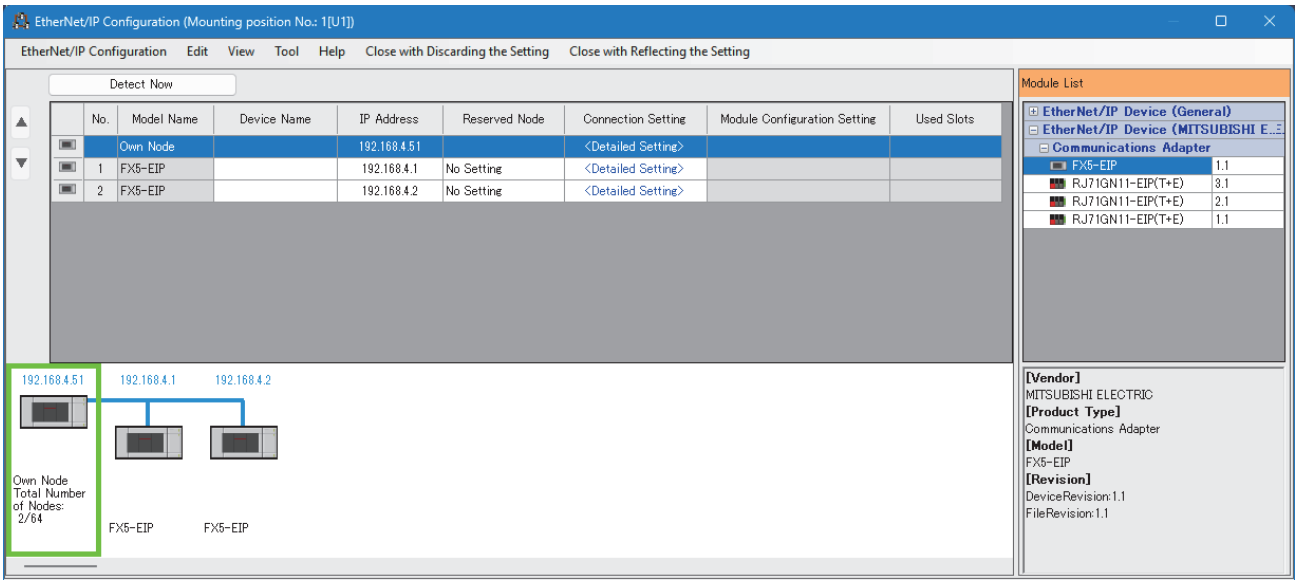
When "Auto-refresh Batch Setting" and "Points Batch Setting" are used, connections must be set in "EtherNet/IP Configuration" in advance.

**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.

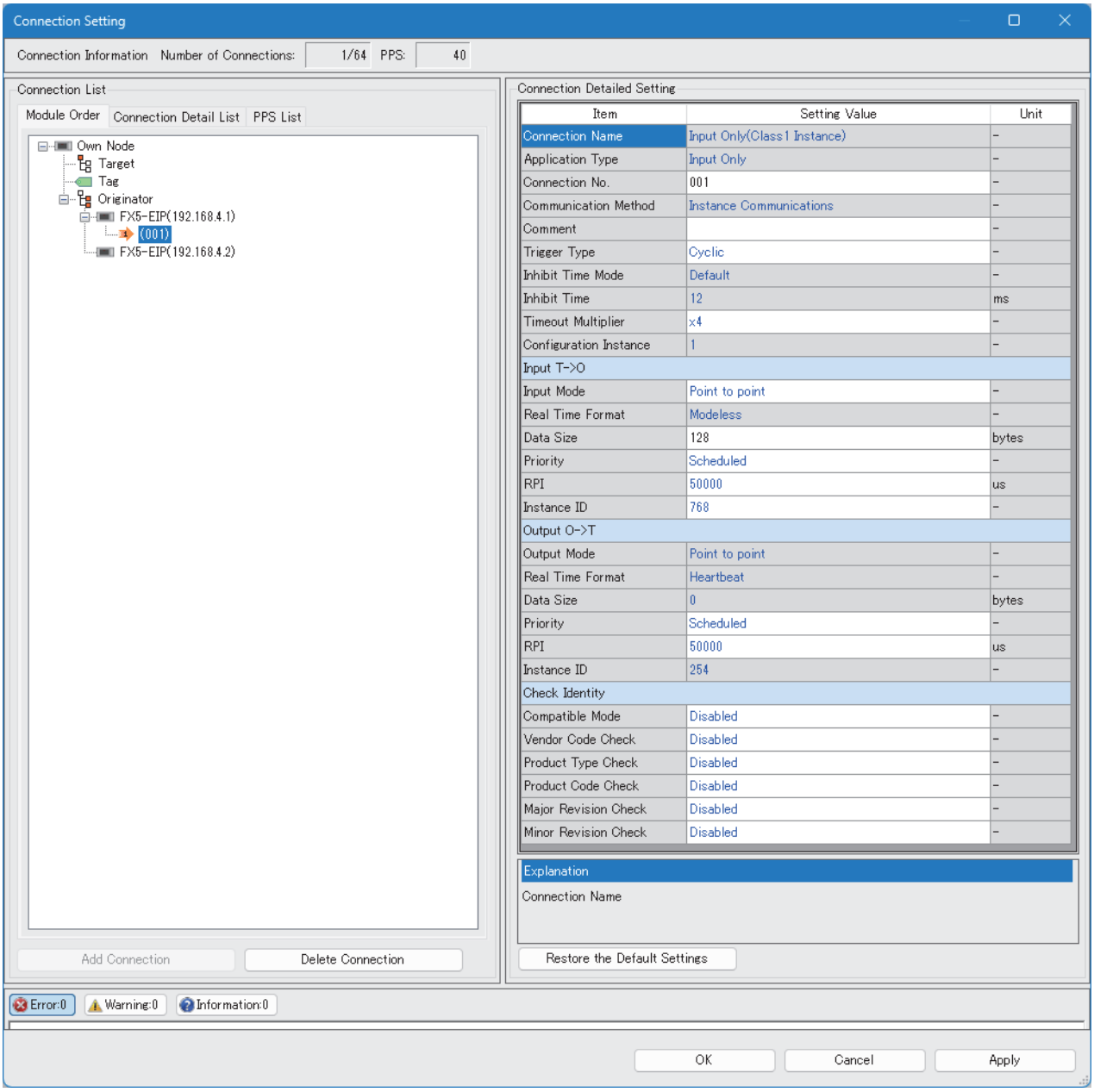



**Point**

If "FX5-EIP" is not shown in the "Module List", it is necessary to add the EDS file.
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

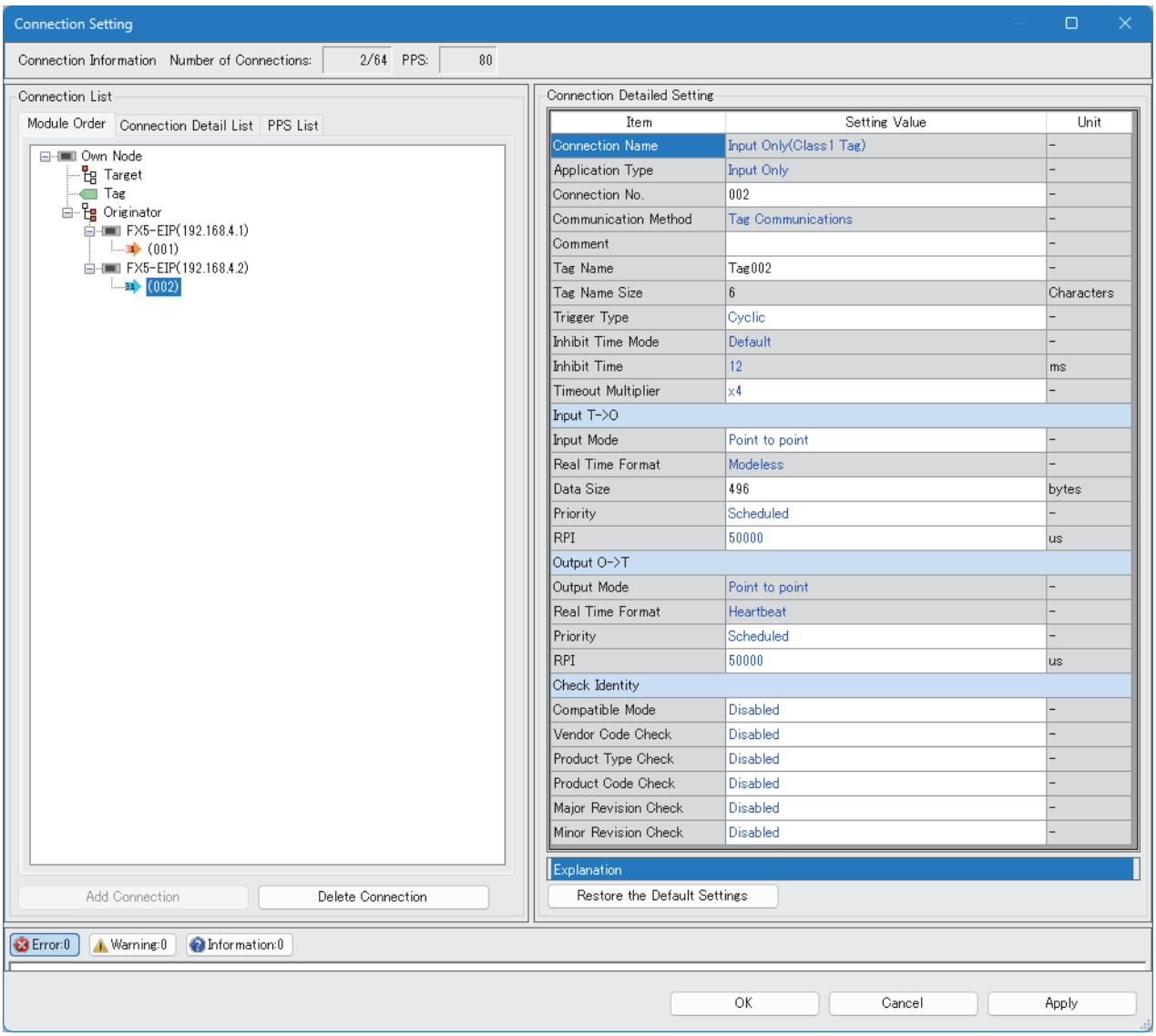



• When adding a connection, select [Input Only(Class1 Instance)].

• 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




• When adding a connection, select [Input Only(Class1 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.

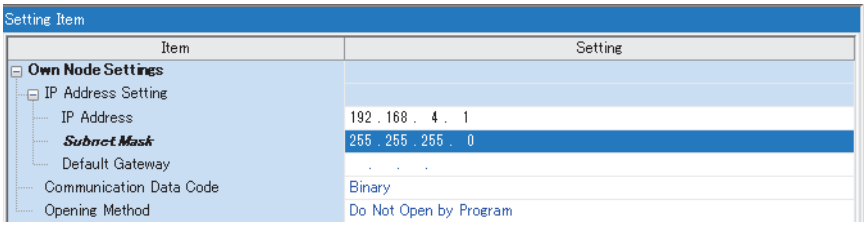
[Online] ⇨ [Write to PLC]

## 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]



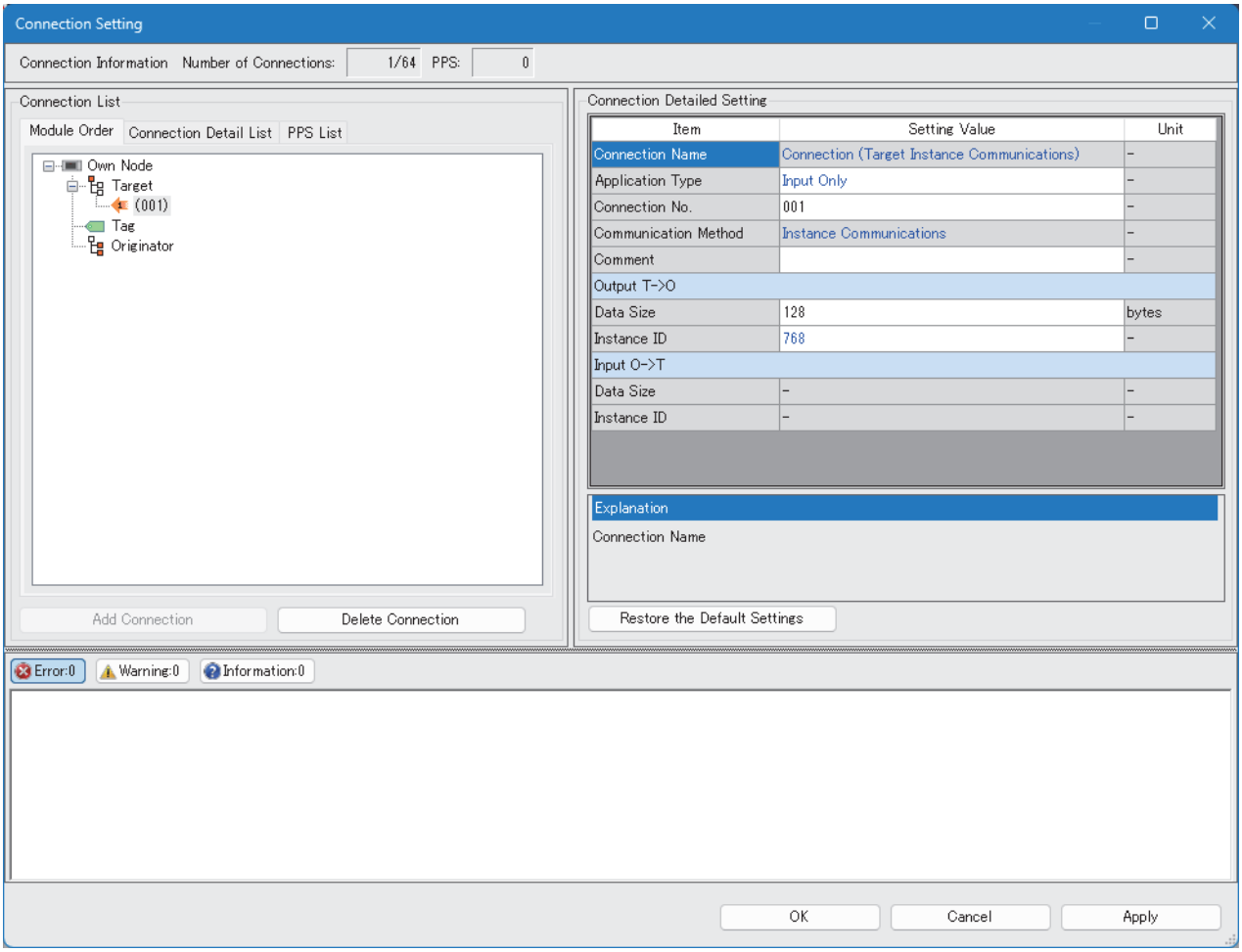

IP address: 192.168.4.1
Subnet mask: 255.255.255.0

**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.

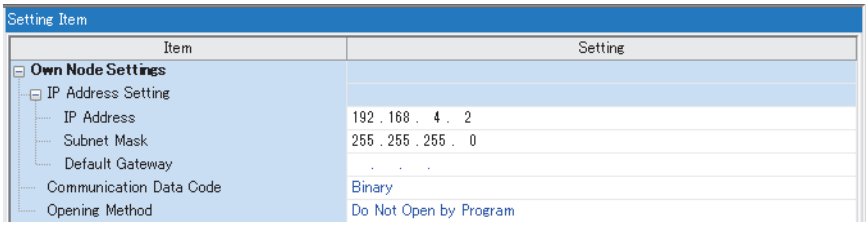
[Online] ⇨ [Write to PLC]

## 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.

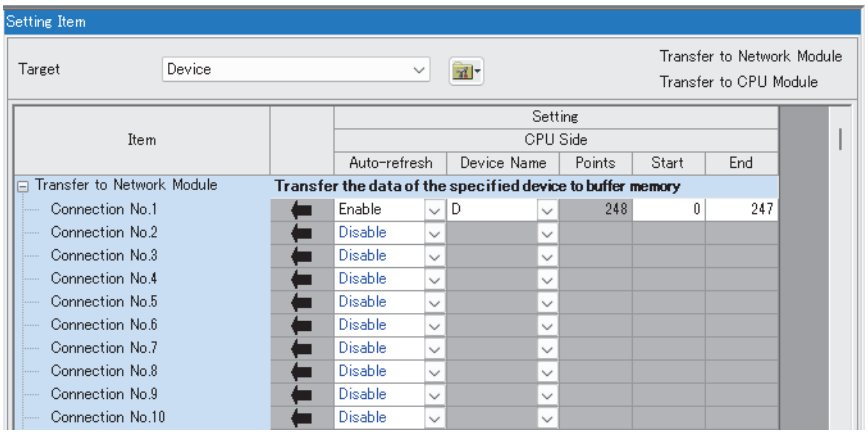
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-EIP] ⇨ [Module Parameter] ⇨ [Basic Settings]




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>




■Transfer to the network module

• Connection number 1: D0 to D247

**Point**

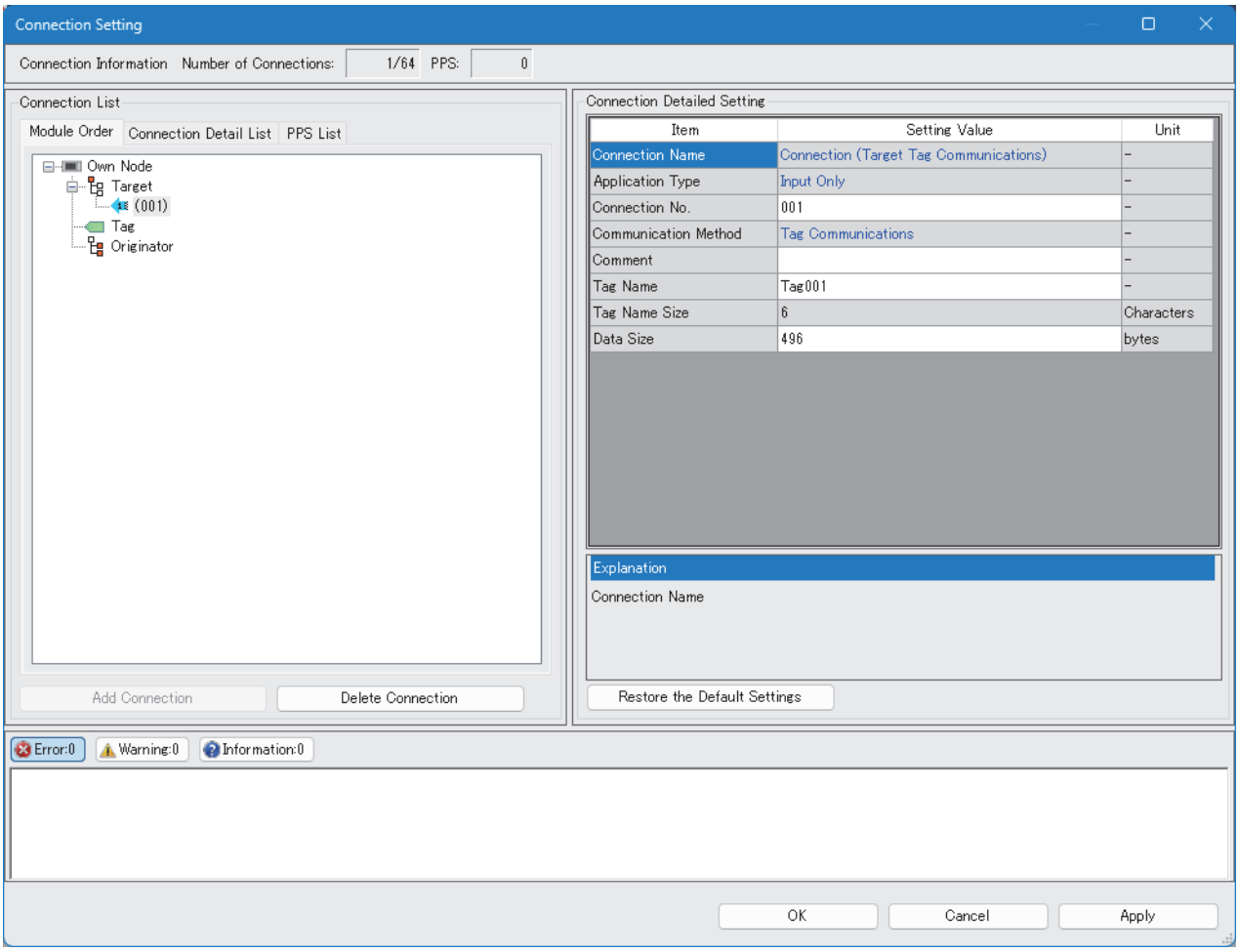
When "Auto-refresh Batch Setting" and "Points Batch Setting" are used, connections must be set in "EtherNet/IP Configuration" in advance.

**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.




- 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]

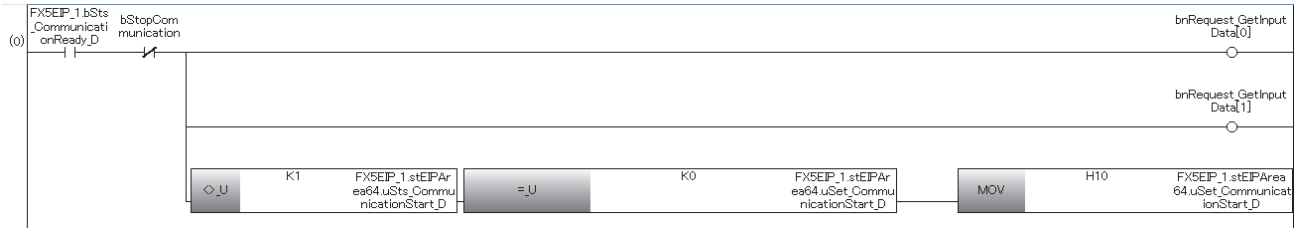
# Program example

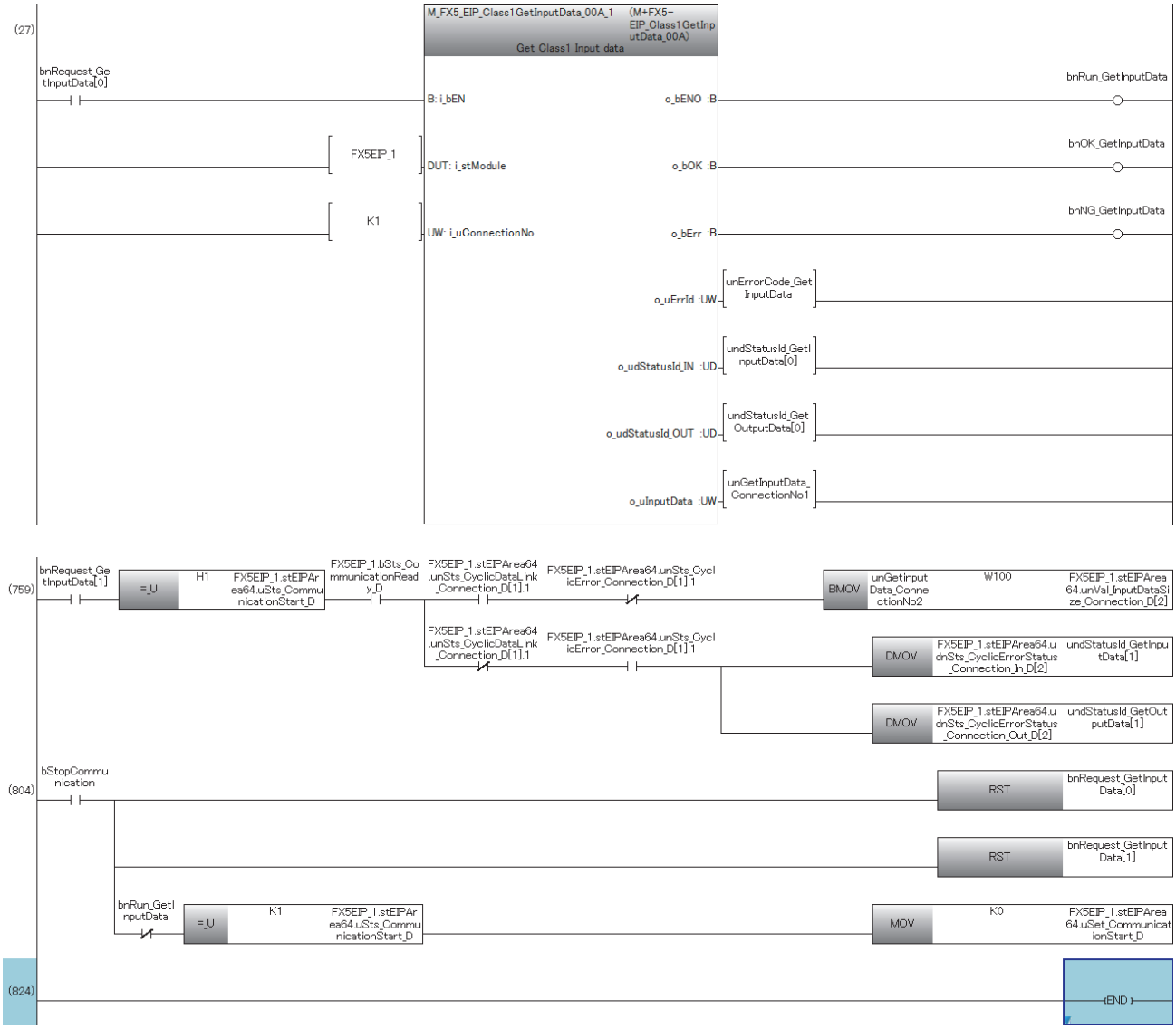
The following shows program examples that start I/O data communication in cyclic communication.

## 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.<br>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.<br>MELSEC iQ-F FX5 User's Manual (Application) | | |
| FBs to be used | • M+FX5-EIP_Class1GetInputData | | |

| | 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 |






(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, the input data received from target 1 continues to be stored from D0 for the data size set in connection number 1.

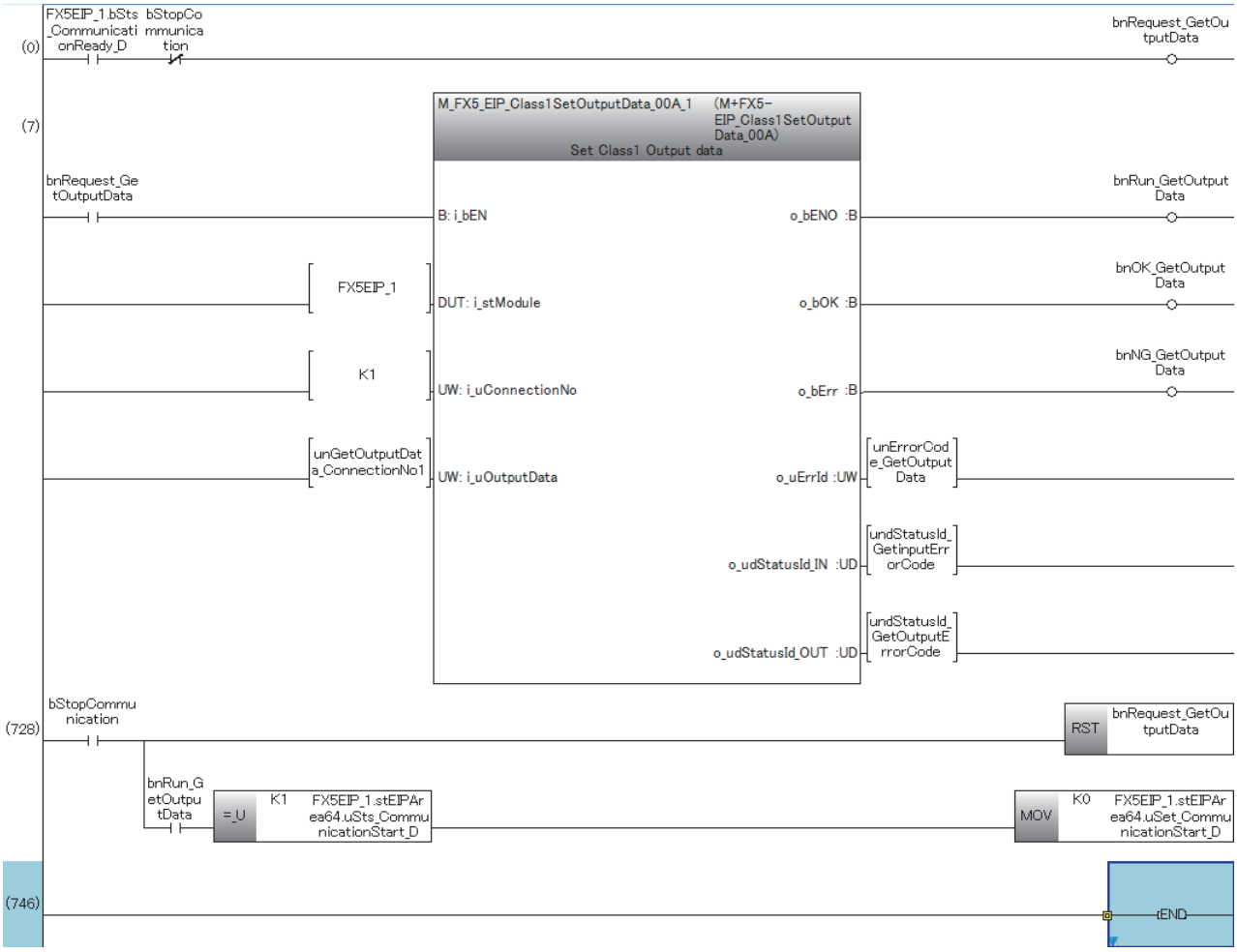
(759) When M1 is on, while 'Cyclic communication data link status' (U1\G1328.1) of connection number 2 is normal, the input data received from target 2 is refreshed from D200 by the data size set in connection number 2 and then the data is copied to W100 or later.

(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 | Define global labels as shown below.<br>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.<br>MELSEC iQ-F FX5 User's Manual (Application) | | |
| FBs to be used | • M+FX5-EIP_Class1SetOutputData | | |

| | 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 |




(0) Set the processing for output data to connection number 1 and start EtherNet/IP communications.

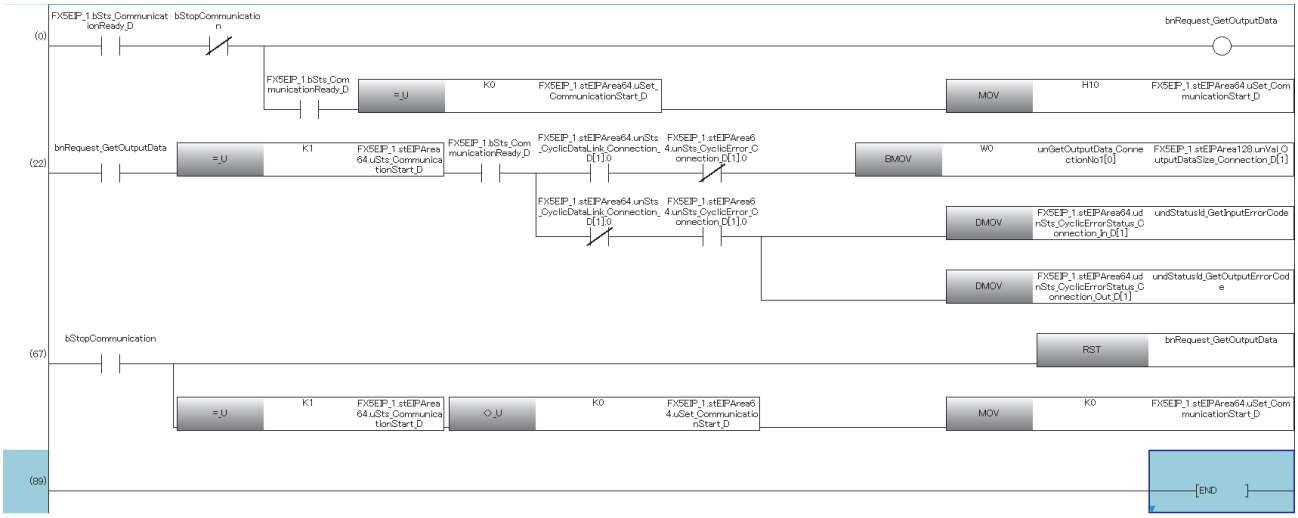
(7) When M0 is on, "M+FX5-EIP_Class1SetOutputData" is executed to set the connection number 2 output data.
When M20 is on, the output data set in D0 or later is sent to the originator according to the data size set for connection number 1.

(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.<br>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.<br>MELSEC iQ-F FX5 User's Manual (Application) | | |

| | 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 | D2003 |




(0) Set the processing for output data to 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 and later are copied to D0 and later as output data.
The data stored in D0 or later is refreshed as transmission data for the number of refresh points and then sent to the originator.

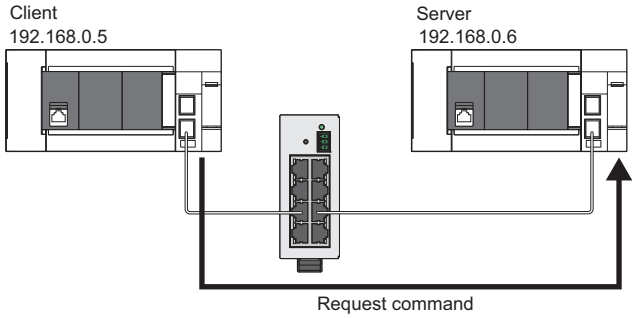
(67) By turning on M200, output data setting and EtherNet/IP communication are stopped.

# 8.3 UCMM Instance Communications Communication Example

This section describes examples of executing UCMM instance communications between FX5-EIP modules.

## System configuration

The following system configuration is used to explain communication 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**

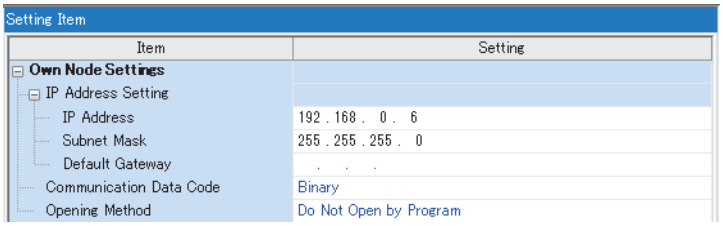
For UCMM instance communications, parameter settings in "EtherNet/IP Configuration" are not required.

## FX5-EIP (server) settings

Connect the engineering tool to the server-side CPU module and set the parameters.

**1.** Set the IP address.

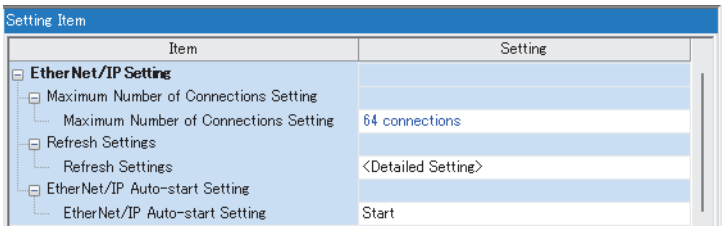
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-EIP] ⇨ [Module Parameter] ⇨ [Basic Settings]




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]




**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.

# Program example

The following example shows a program to execute UCMM instance communications by turning on the UCMM command send request in the program.

When the program is executed, the following request commands are sent 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. |

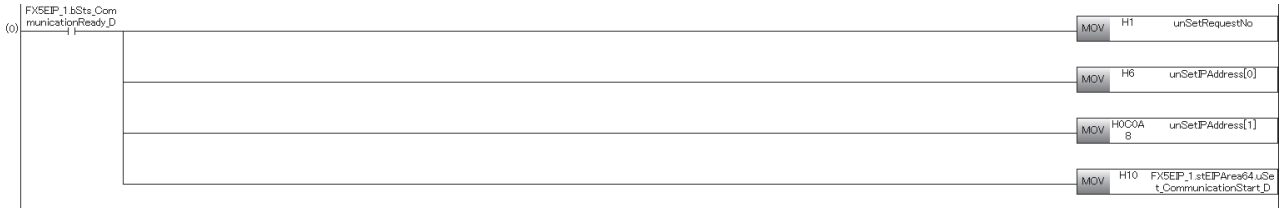
**Point**

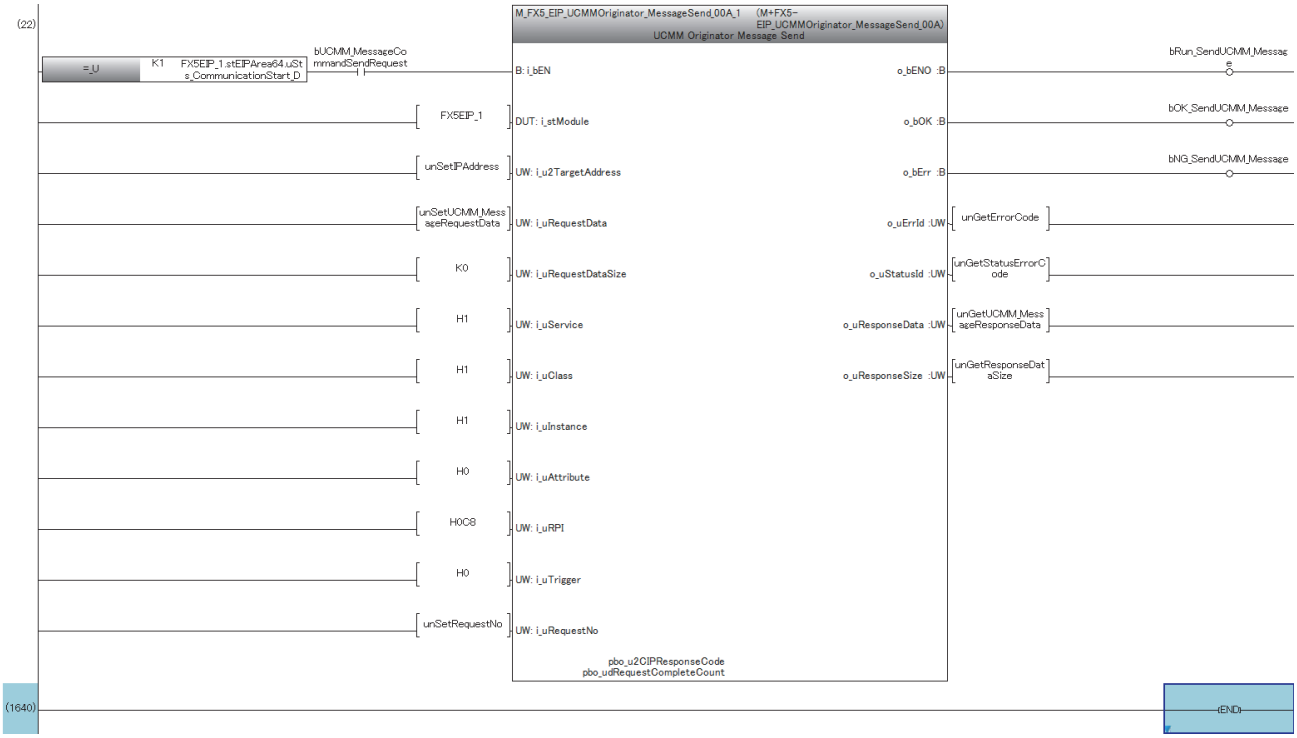
A server-side program is not required.

## 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 | Define global labels as shown below.<br>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.<br>📖 MELSEC iQ-F FX5 User's Manual (Application)<br>For the response data storage location, refer to the manuals of the server EtherNet/IP device and secure the sufficient data size. | | |
| FBs to be used | • M+FX5-EIP_UCMMOriginator_MessageSend | | |

| | Label Name | Data Type | | Class | Assign (Device/Label) |
|---|---|---|---|---|---|
| 1 | bUCMM_MessageCommandSendReque | 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 |






(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 sent to the server side.
When the response is normally received, M120 is turned on and the response result from the server side is stored in D2000 or later. (Half of the response data size stored in D3005 (bytes) are stored (rounded up).)
If the response data size is an odd number, only the lower 1 byte of the end device is stored.

**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.

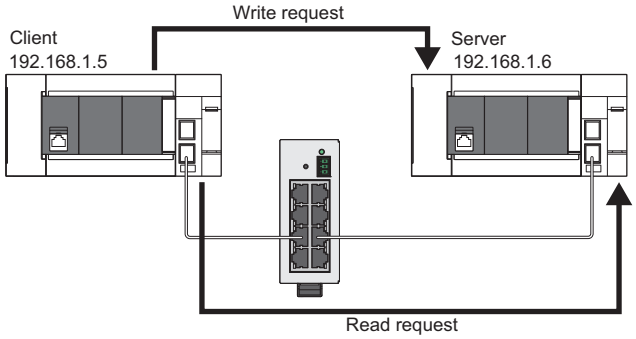
# 8.4 UCMM Tag Communications Communication Example

This section describes examples of executing UCMM tag communications between FX5-EIP modules.

## System configuration

The following system configuration is used to explain communication 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 in D1000 or later 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 sent.
If the requested data type is DINT, request data consisting of the request data size × 2 words is sent.

### ■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 amount according to the read data size (size stored in D3204) is stored in D2000 or later.

(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 sending 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 having its current value 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

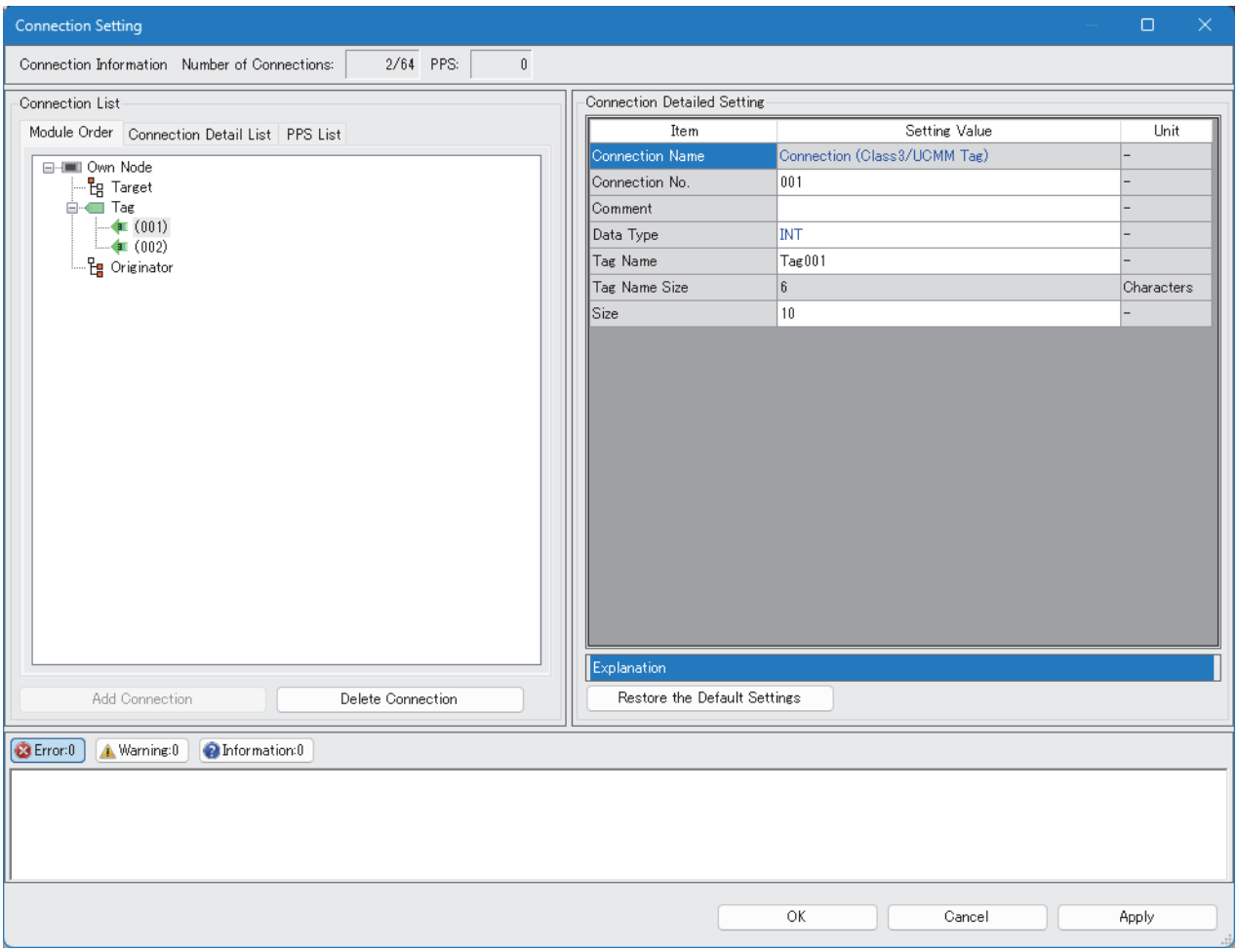
***2.*** Click the [Apply] button.

***3.*** Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

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

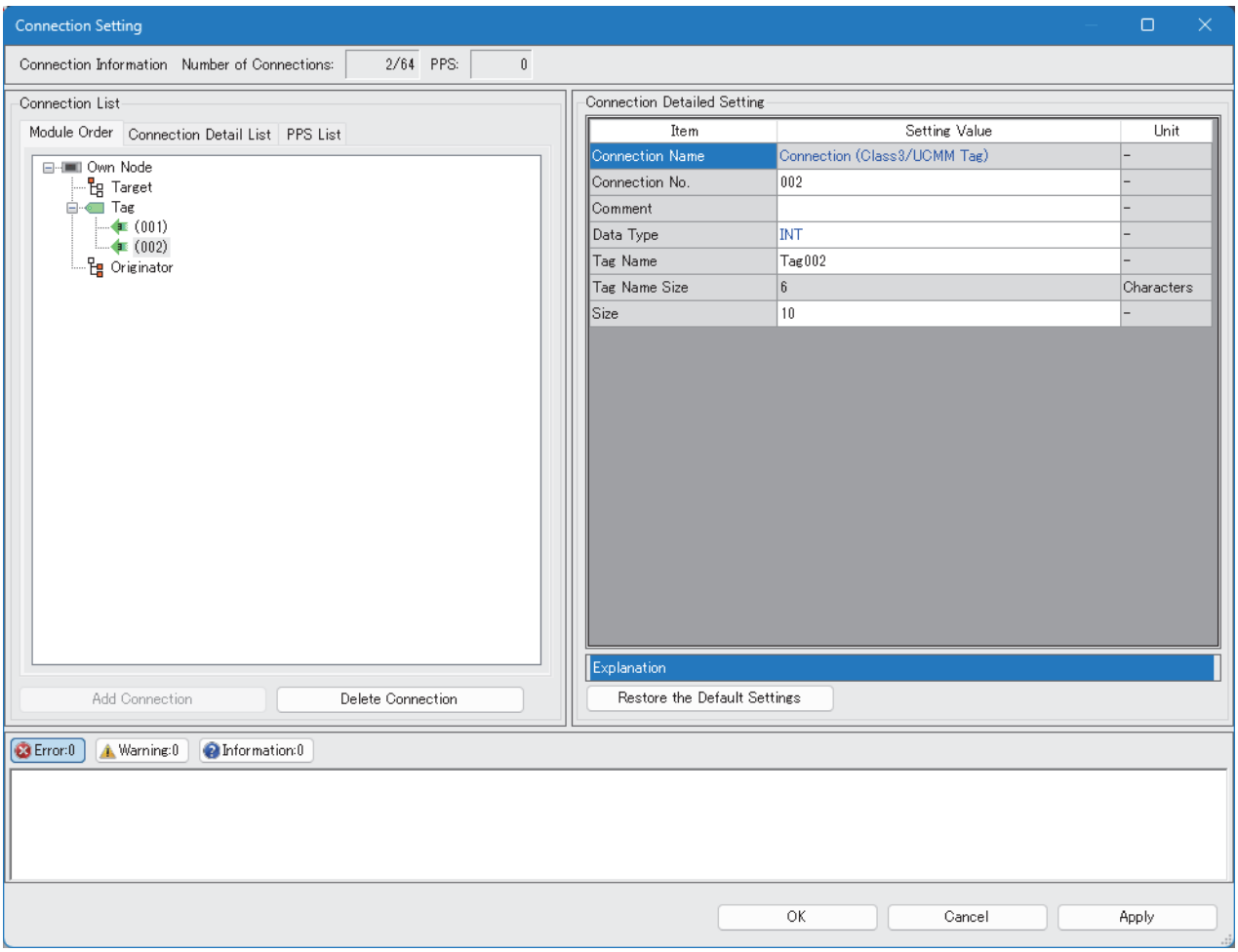
***4.*** Double-click <Detailed Setting> in the "Connection Setting" column and set the tags for connection number 1 and connection number 2.

• Tag setting (Connection number 1)




• 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]

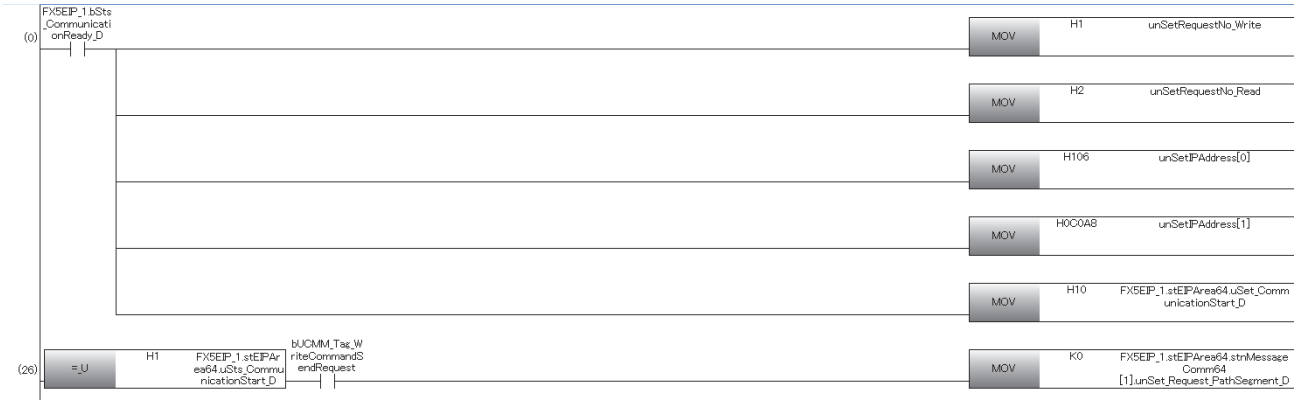
# Program example

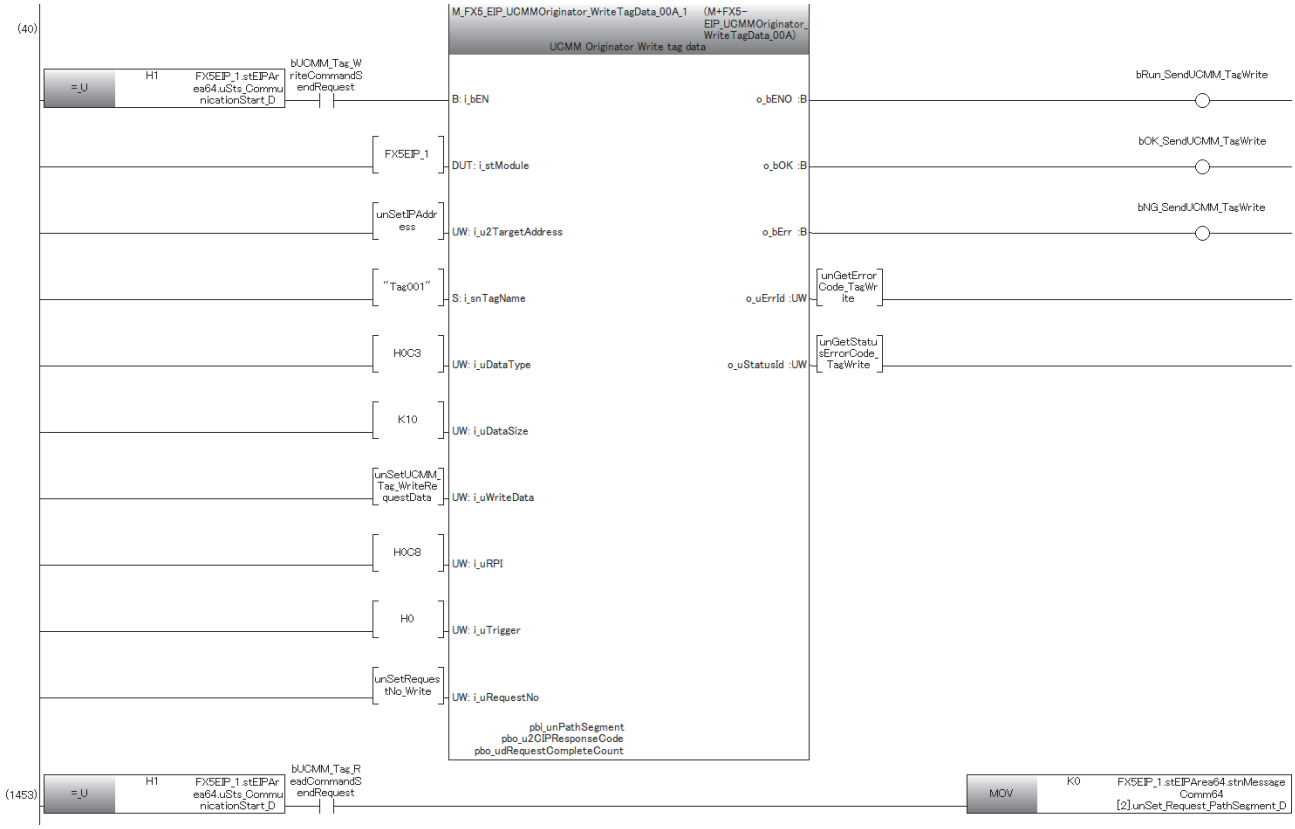
The UCMM tag communication program is executed by changing the CPU module from STOP to RUN.

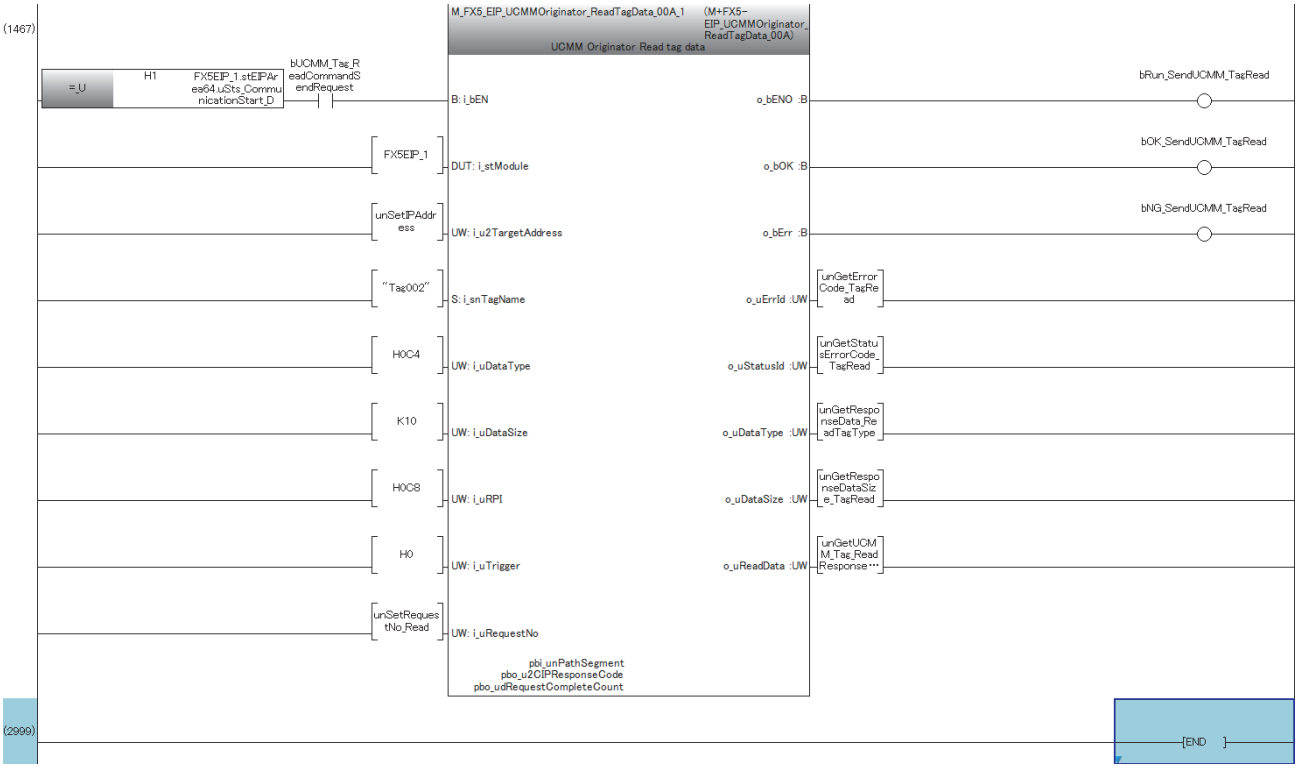
## Client-side program

| 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.<br>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.<br>MELSEC iQ-F FX5 User's Manual (Application) | | |
| FBs to be used | • M+FX5-EIP_UCMMOriginator_WriteTagData<br>• M+FX5-EIP_UCMMOriginator_ReadTagData | | |

| | Label Name | Data Type | | Class | Assign (Device/Label) |
|---|---|---|---|---|---|
| 1 | bUCMM_Tag_WriteCommandSendRe | Bit | ... | VAR_GLOBAL | M100 |
| 2 | bUCMM_Tag_ReadCommandSendRe | Bit | ... | VAR_GLOBAL | M101 |
| 3 | bRun_SendUCMM_TagWrite | Bit | ... | VAR_GLOBAL | M110 |
| 4 | bOK_SendUCMM_TagWrite | Bit | ... | VAR_GLOBAL | M120 |
| 5 | bNG_SendUCMM_TagWrite | Bit | ... | VAR_GLOBAL | M130 |
| 6 | bRun_SendUCMM_TagRead | Bit | ... | VAR_GLOBAL | M111 |
| 7 | bOK_SendUCMM_TagRead | Bit | ... | VAR_GLOBAL | M121 |
| 8 | bNG_SendUCMM_TagRead | Bit | ... | VAR_GLOBAL | M131 |
| 9 | unSetUCMM_Tag_WriteRequestDat | Word [Unsigned]/Bit String [16-bit](0..706) | ... | VAR_GLOBAL | D1000 |
| 10 | unGetUCMM_Tag_ReadResponseD | Word [Unsigned]/Bit String [16-bit](0..706) | ... | VAR_GLOBAL | D2000 |
| 11 | unSetIPAddress | Word [Unsigned]/Bit String [16-bit](0..1) | ... | VAR_GLOBAL | D3000 |
| 12 | unSetRequestNo_Write | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3100 |
| 13 | unGetErrorCode_TagWrite | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3101 |
| 14 | unGetStatusErrorCode_TagWrite | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3102 |
| 15 | unSetRequestNo_Read | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3200 |
| 16 | unGetErrorCode_TagRead | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3201 |
| 17 | unGetStatusErrorCode_TagRead | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3202 |
| 18 | unGetResponseData_ReadTagType | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3203 |
| 19 | unGetResponseDataSize_TagRead | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3204 |




(40)
M_FX5_EIP_UCMMOriginator_WriteTagData_00A_1
(M+FX5-EIP_UCMMOriginator_WriteTagData_00A)
UCMM Originator Write tag data
=_U
H1
FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D
bUCMM_Tag_WriteCommandSendRequest
B: i_bEN
o_bENO :B
bRun_SendUCMM_TagWrite
FX5EIP_1
DUT: i_stModule
o_bOK :B
bOK_SendUCMM_TagWrite
unSetIPAddress
UW: i_u2TargetAddress
o_bErr :B
bNG_SendUCMM_TagWrite
"Tag001"
S: i_snTagName
o_uErrId :UW
unGetErrorCode_TagWrite
H0C3
UW: i_uDataType
o_uStatusId :UW
unGetStatusErrorCode_TagWrite
K10
UW: i_uDataSize
unSetUCMM_Tag_WriteRequestData
UW: i_uWriteData
H0C8
UW: i_uRPI
H0
UW: i_uTrigger
unSetRequestNo_Write
UW: i_uRequestNo
pbi_unPathSegment
pbo_u2CIPResponseCode
pbo_udRequestCompleteCount
(1453)
=_U
H1
FX5EIP_1.stEIPArea64.uSts_CommunicationStart_D
bUCMM_Tag_ReadCommandSendRequest
MOV
K0
FX5EIP_1.stEIPArea64.stnMessageComm64[2].unSet_Request_PathSegment_D




(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 sent to the server side.
When M120 is on, 10 words of data stored in D1000 or later 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 sent to the server side.
When M121 is on, the server-side response result is stored in D2000 or later according to the response data size stored in D3204.

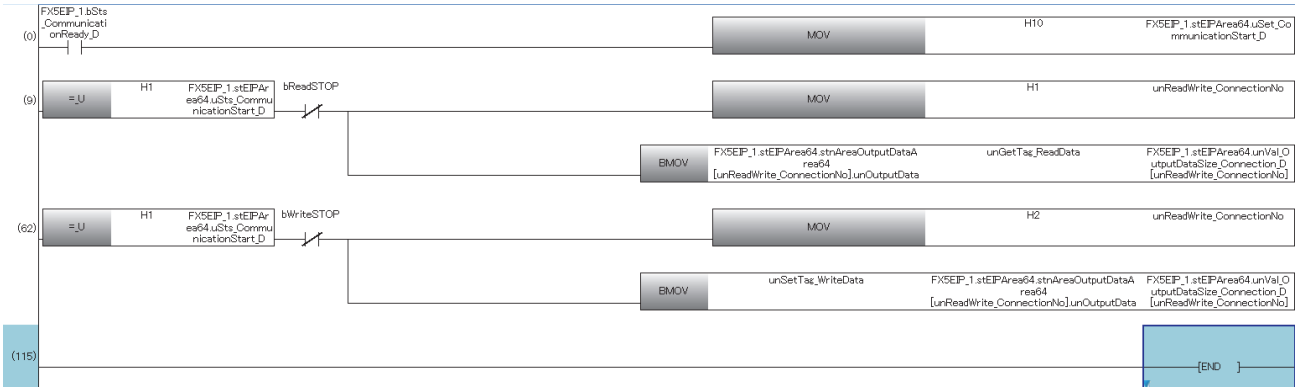
**Point**

- 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 sending 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.<br>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.<br>MELSEC iQ-F FX5 User's Manual (Application) | | |

| | 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 |




(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.

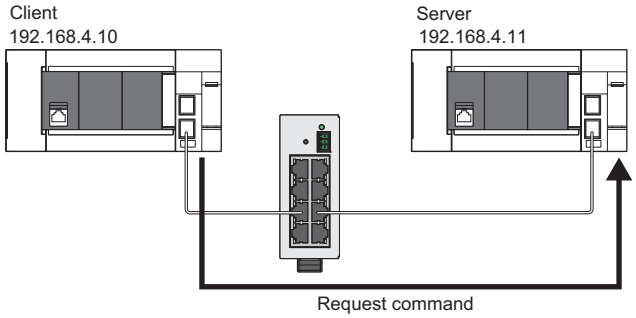
(62) Specify the connection number set for the tag with which to update the current value, and update the data set for the specified tag to the data set in D1000.

# 8.5 Class3 Instance Communications Communication Example

This section describes examples of executing Class3 instance communications between FX5-EIP modules.

## System configuration

The following system configuration is used to explain communication 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.

**Point**

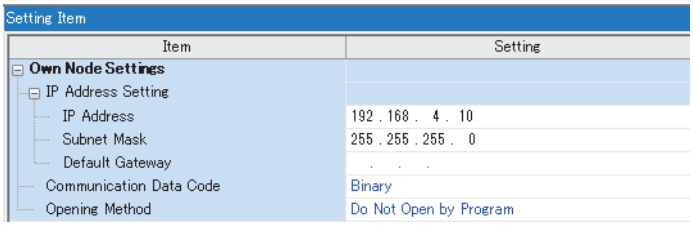
In the program examples, default values are used for settings other than parameters shown in the setting procedure. For the parameters, refer to the following.
☞ Page 89 PARAMETER SETTINGS

## 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]



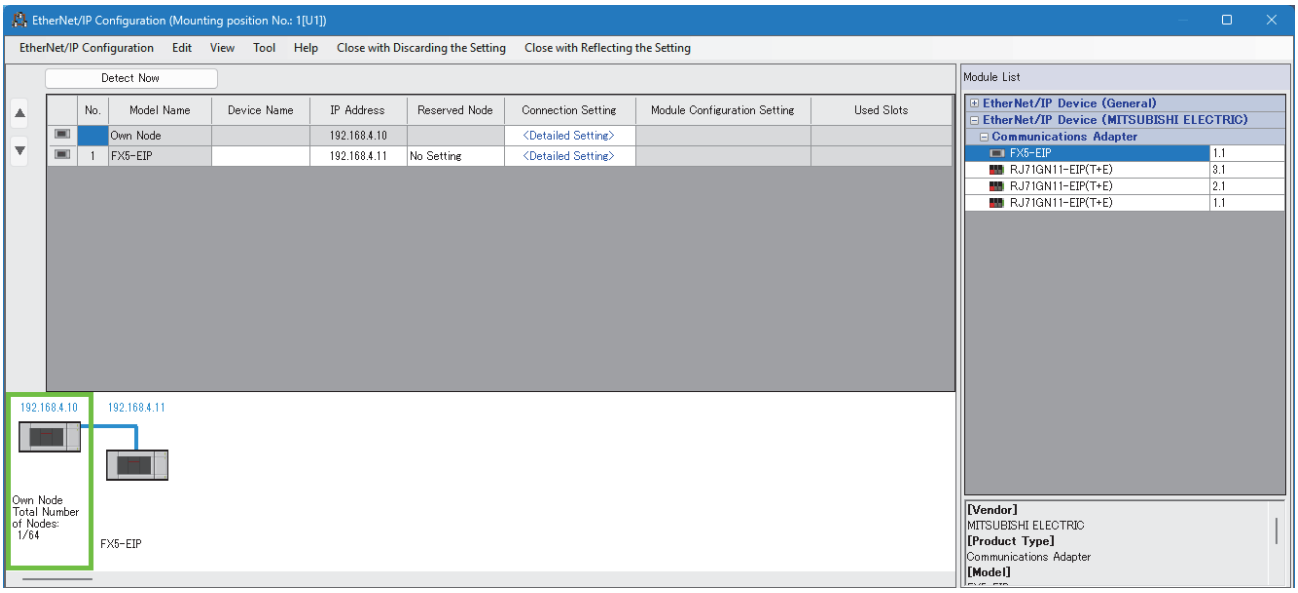

IP address: 192.168.4.10
Subnet mask: 255.255.255.0

**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)]

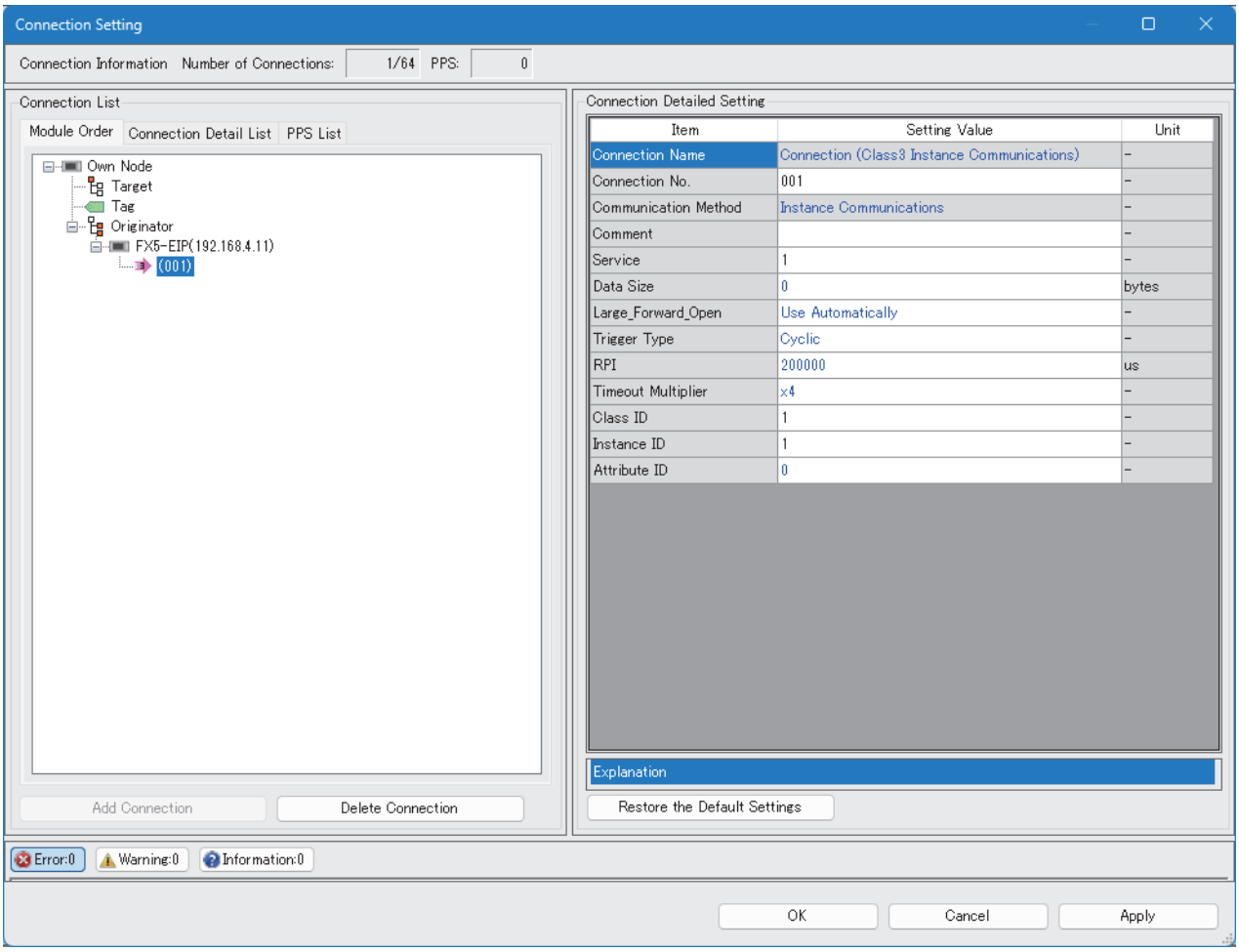
**4.** From "Module List", add "FX5-EIP" to the list of EtherNet/IP devices.




**Point**

If "FX5-EIP" is not shown in the "Module List", it is necessary to add the EDS file.
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.

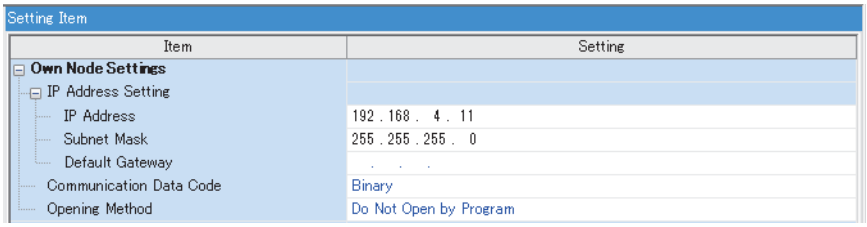
[Online] ⇨ [Write to PLC]

## FX5-EIP (server) settings

Connect the engineering tool to the server-side CPU module and set the parameters.

**1.** Set the IP address.

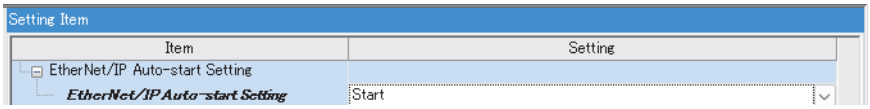
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-EIP] ⇨ [Module Parameter] ⇨ [Basic Settings]




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]




**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

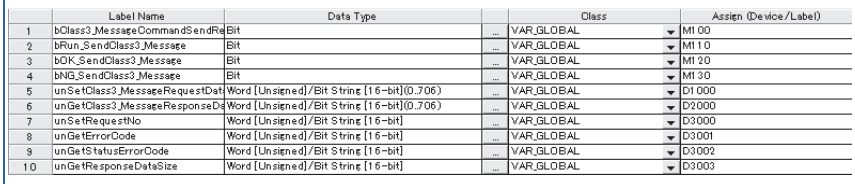
The Class3 instance communications program is executed by changing the CPU module from STOP to RUN.
The following example shows a program to execute Class3 instance communications by turning on the Class3 command sent request in the program.
When the program is executed, the following request commands are sent 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. |

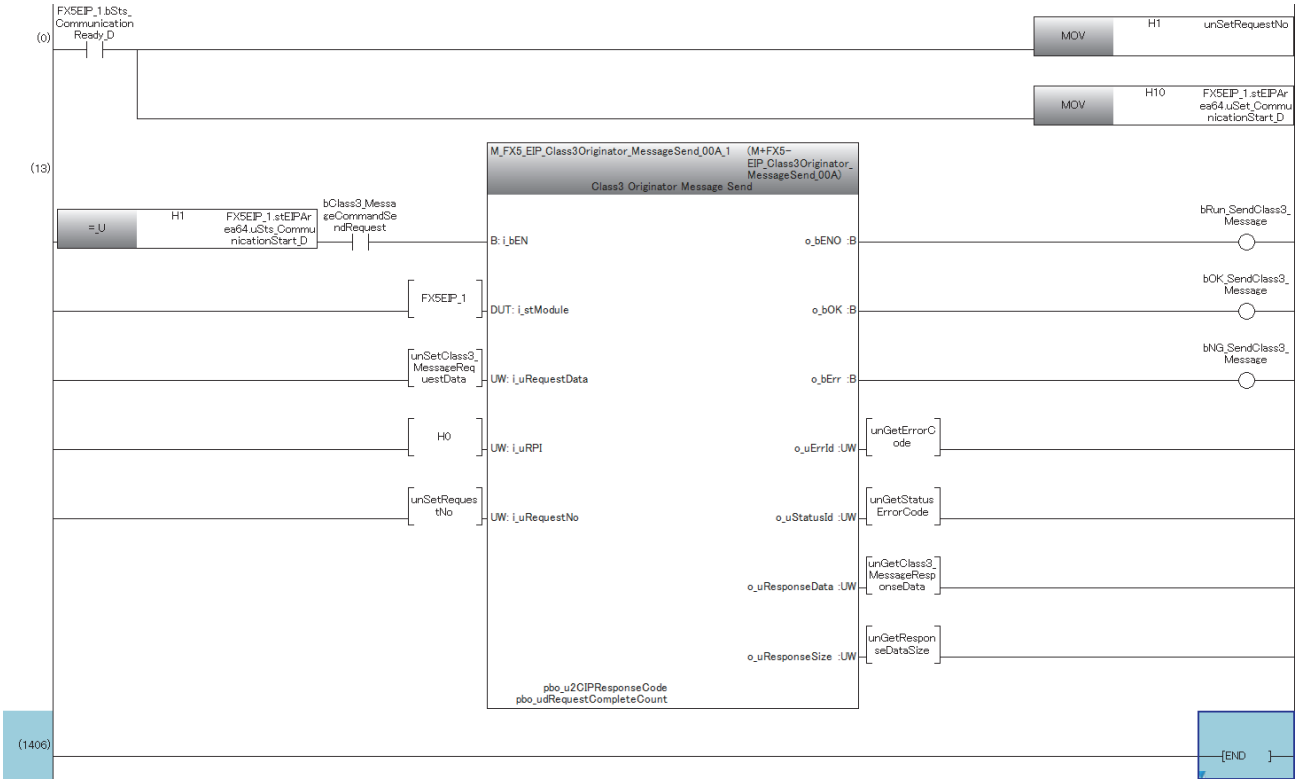
**Point**

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 | Define global labels as shown below.<br>  <br>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.<br>MELSEC iQ-F FX5 User's Manual (Application)<br>For the response data storage location, refer to the manuals of the server EtherNet/IP device and secure the sufficient data size. | | |
| FBs to be used | • M+FX5-EIP_Class3Originator_MessageSend | | |

| | Label Name | Data Type | | Class | Assign (Device/Label) |
|---|---|---|---|---|---|
| 1 | bClass3_MessageCommandSendRe | Bit | ... | VAR_GLOBAL | M100 |
| 2 | bRun_SendClass3_Message | Bit | ... | VAR_GLOBAL | M110 |
| 3 | bOK_SendClass3_Message | Bit | ... | VAR_GLOBAL | M120 |
| 4 | bNG_SendClass3_Message | Bit | ... | VAR_GLOBAL | M130 |
| 5 | unSetClass3_MessageRequestDat | Word [Unsigned]/Bit String [16-bit](0..706) | ... | VAR_GLOBAL | D1000 |
| 6 | unGetClass3_MessageResponseDa | Word [Unsigned]/Bit String [16-bit](0..706) | ... | VAR_GLOBAL | D2000 |
| 7 | unSetRequestNo | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3000 |
| 8 | unGetErrorCode | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3001 |
| 9 | unGetStatusErrorCode | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3002 |
| 10 | unGetResponseDataSize | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3003 |




(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 sent to the server side.
When M120 is on, the response result from the server side is stored in D2000 or later. (Half of the response data size stored in D3003 (bytes) are stored (rounded up).)
If the response data size is an odd number, only the lower 1 byte of the end device is stored.

**Point**

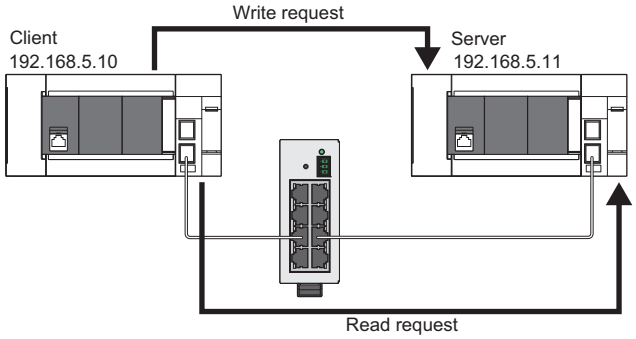
Ensure that the request number to be set is not the same as the request number used for other UCMM communications, Class1 communications, and Class3 communications.

# 8.6 Class3 Tag Communications Communication Example

This section describes examples of executing Class3 tag communications between FX5-EIP modules.

## System configuration

The following system configuration is used to explain communication 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 in D1000 or later 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 sent.
If the requested data type is DINT (00C4H), request data consisting of the request data size × 2 words is sent.

#### ■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 amount according to the read data size (size stored in D3204) is stored in D2000 or later.
(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 having its current value 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.

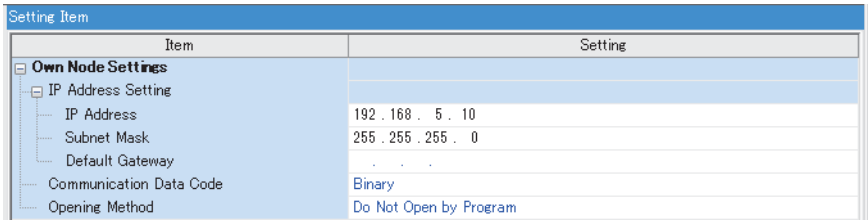
☞ Page 89 PARAMETER SETTINGS

## 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]



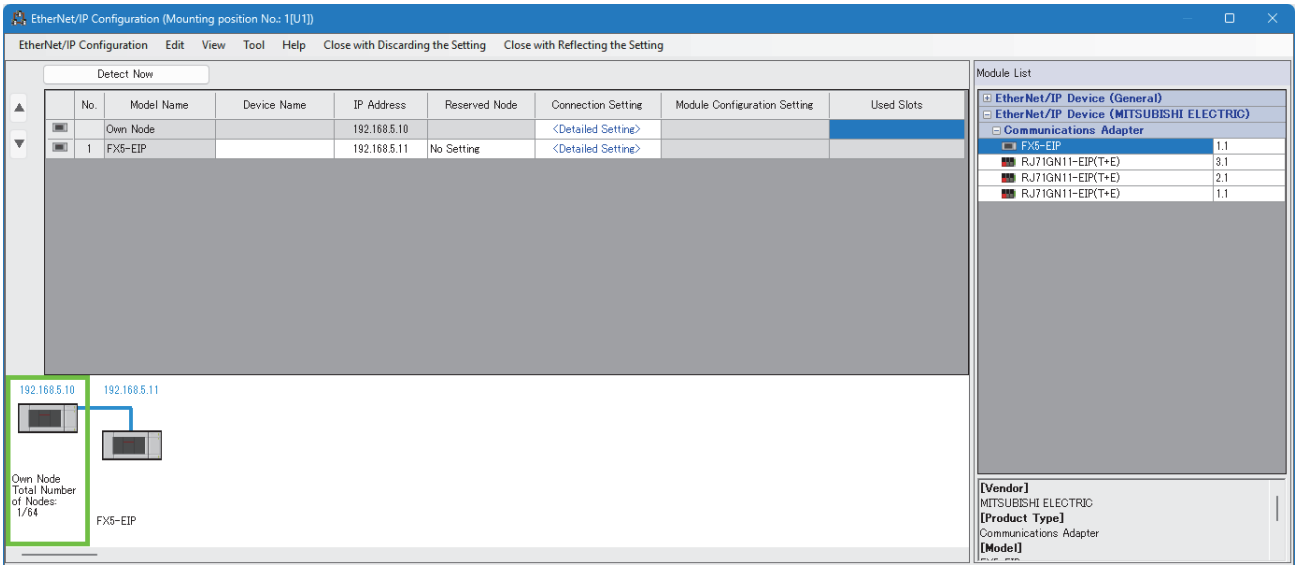

IP address: 192.168.5.10
Subnet mask: 255.255.255.0

**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**

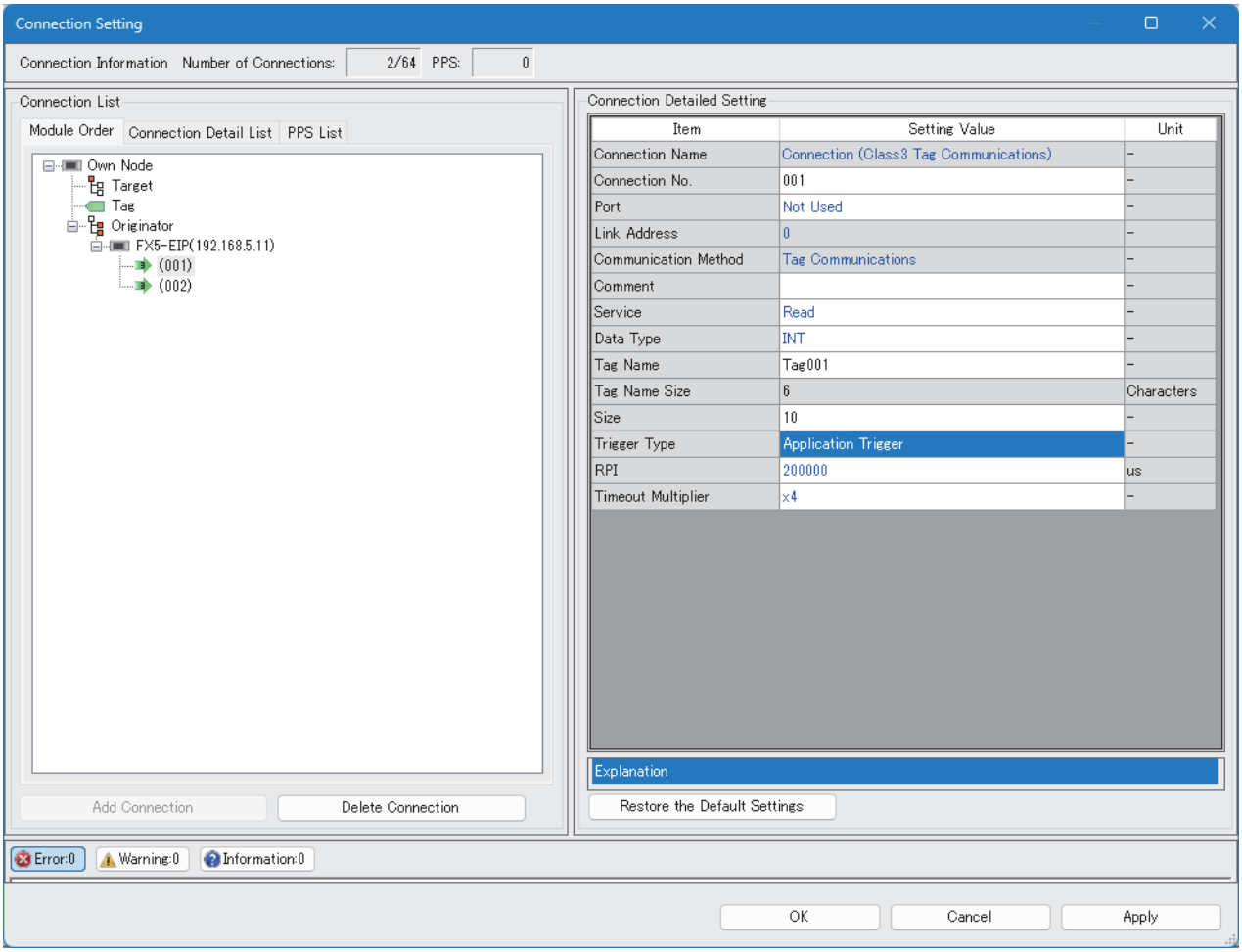
If "FX5-EIP" is not shown in the "Module List", it is necessary to add the EDS file.

For adding the EDS file, refer to the following.

☞ Page 122 Adding/deleting the EDS file

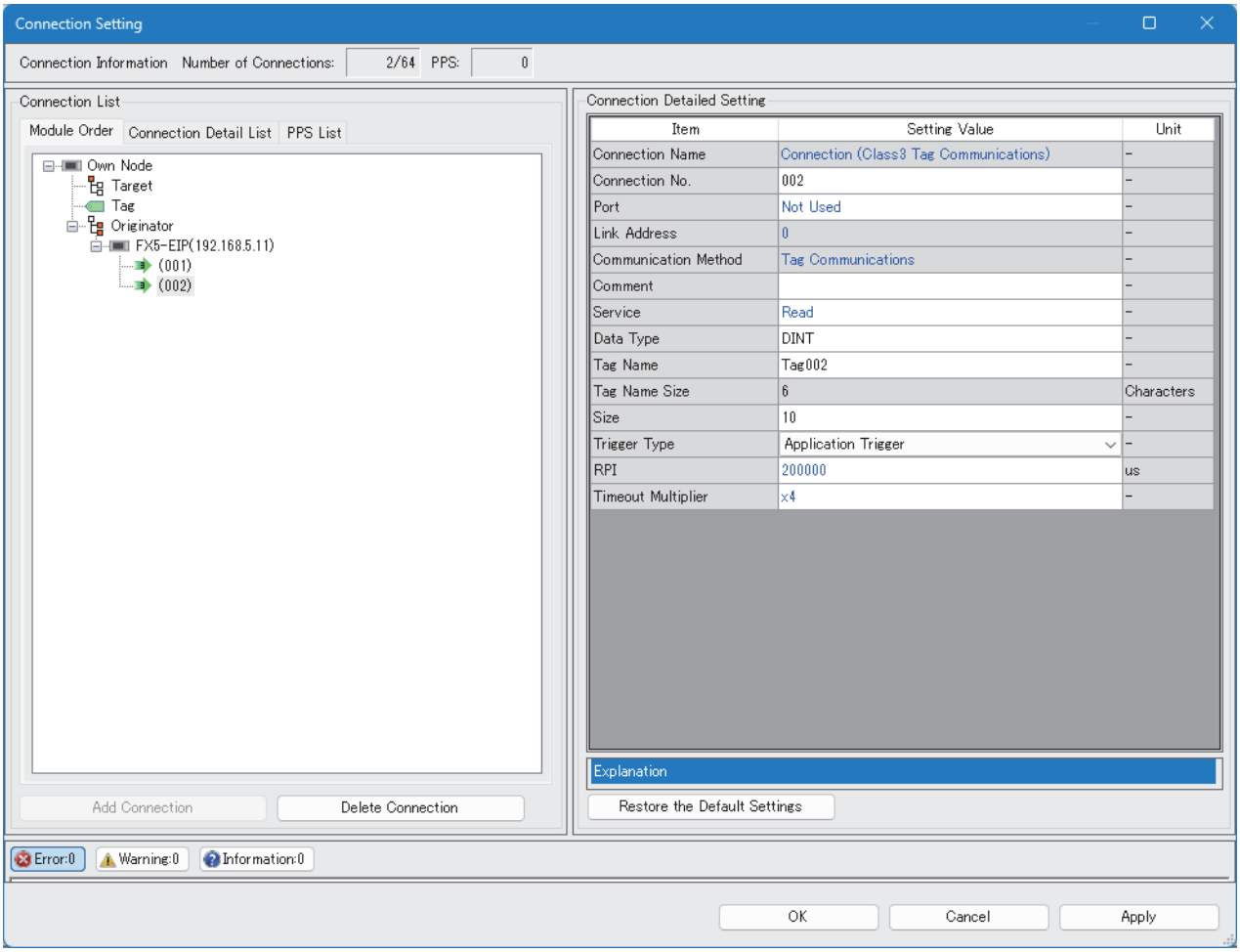
**5.** Double-click <Detailed Setting> in the "Connection Setting" column and set the tags for connection number 1 and connection number 2.

• 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.

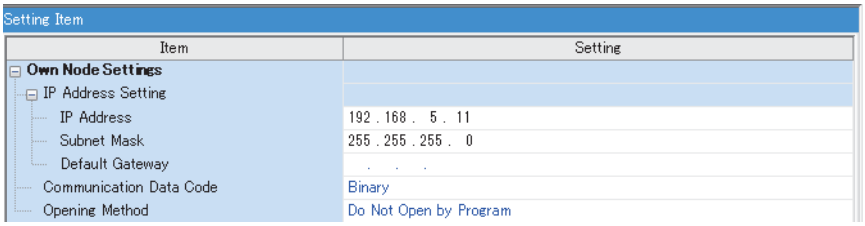
[Online] ⇨ [Write to PLC]

## 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]




IP address: 192.168.5.11
Subnet mask: 255.255.255.0

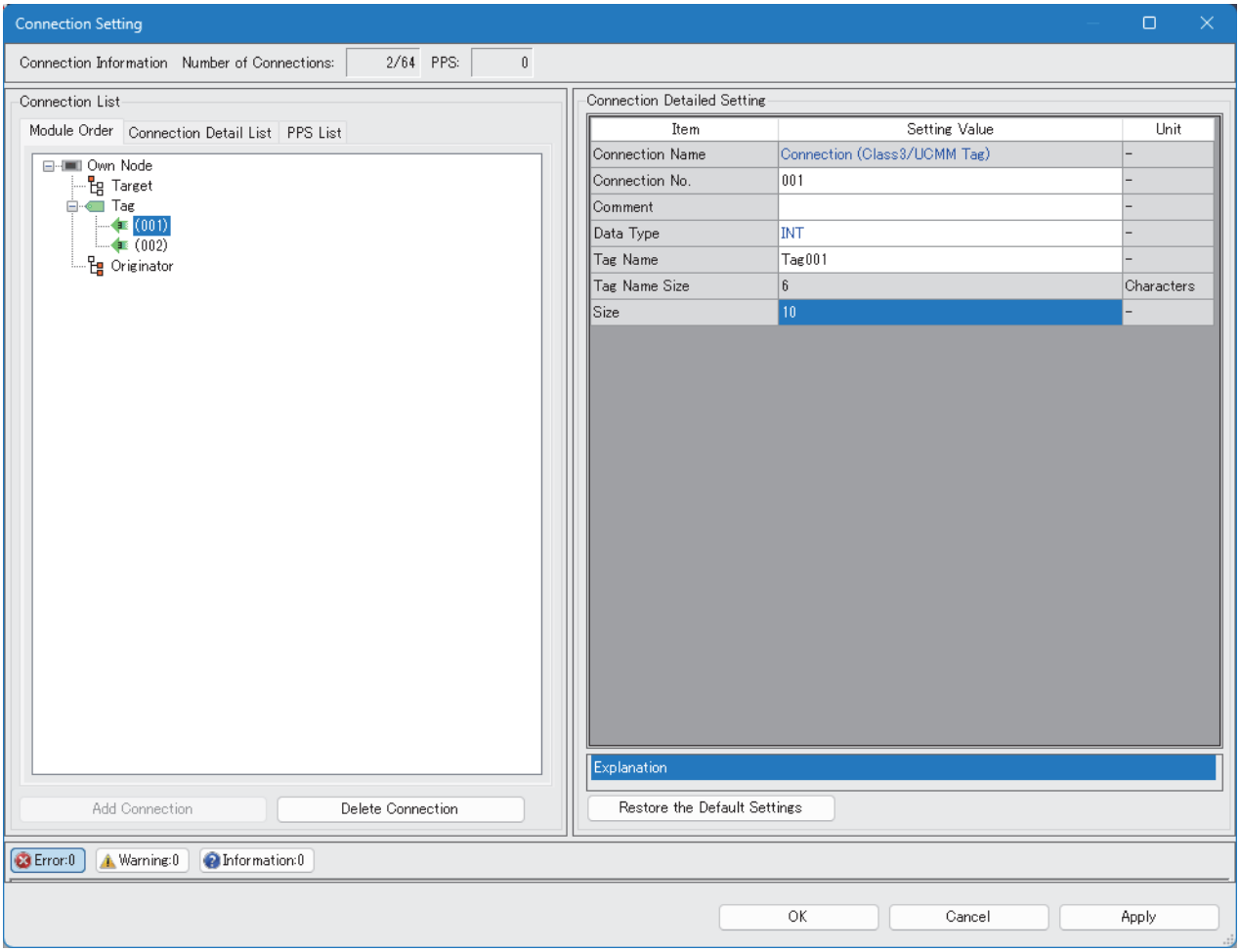
**2.** Click the [Apply] button.

**3.** Set the EtherNet/IP communication parameters in "EtherNet/IP Configuration".

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

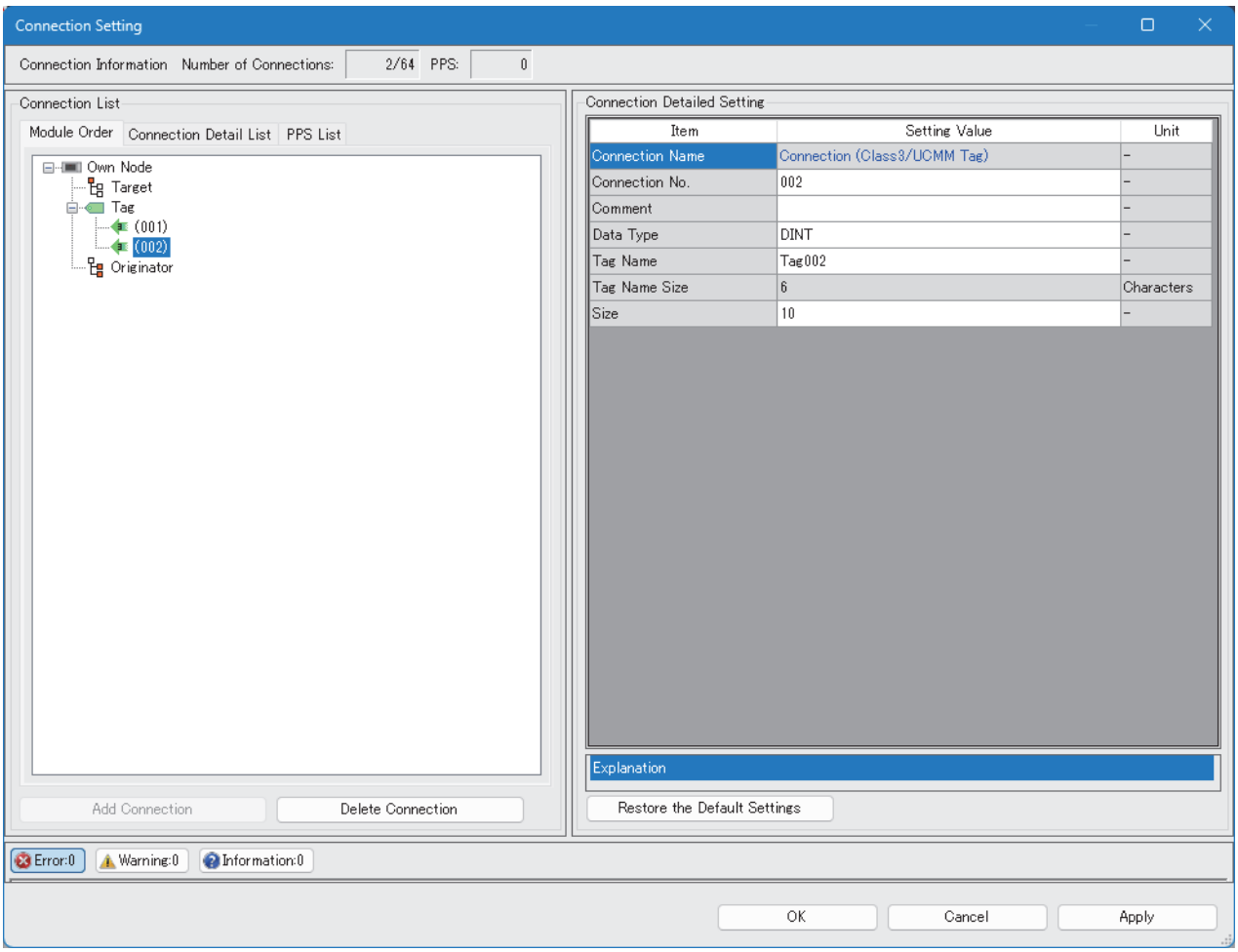
**4.** Double-click <Detailed Setting> in the "Connection Setting" column and set the tags for connection number 1 and connection number 2.

- Tag setting (Connection number 1)




- 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.

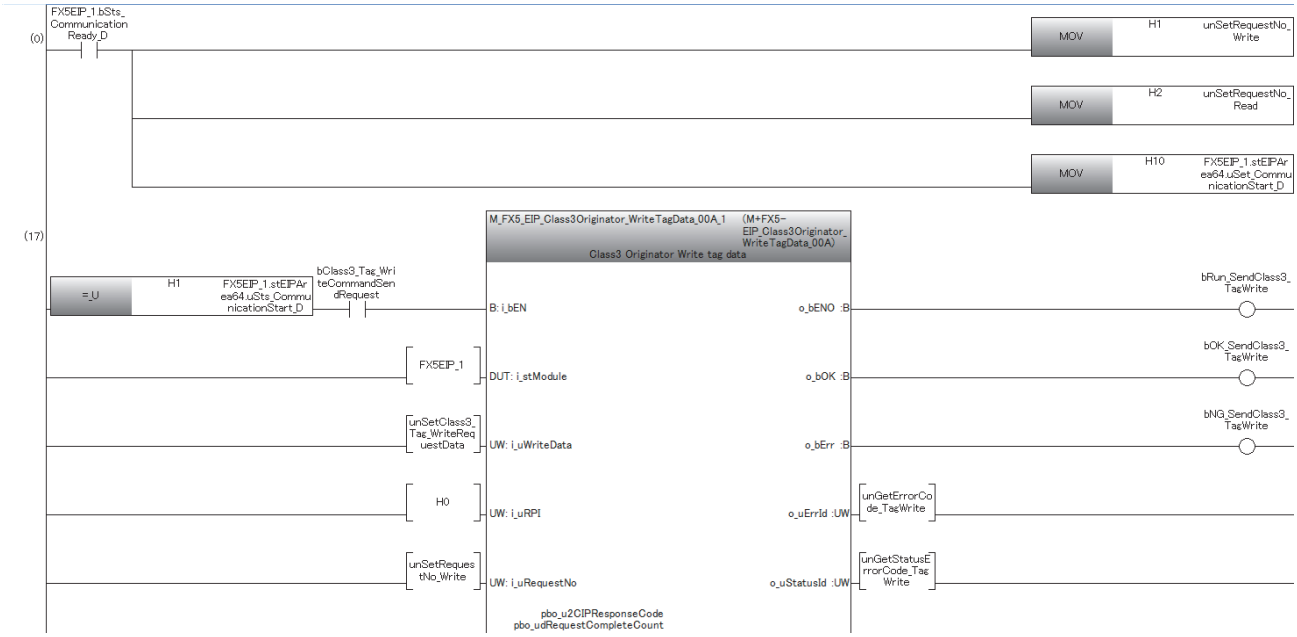
[Online] ⇨ [Write to PLC]

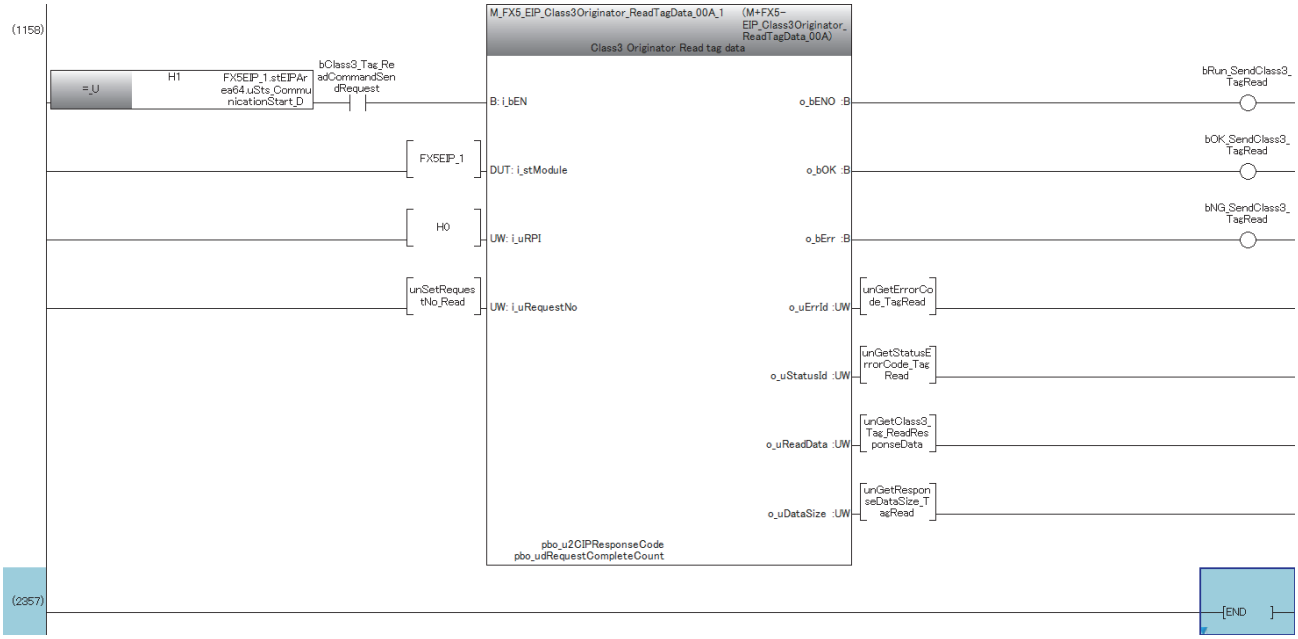
# Program example

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.<br>Label Name / Data Type / Class / Assign (Device/Label)<br>1 bClass3_Tag_WriteCommandSendR Bit VAR_GLOBAL M1 00<br>2 bClass3_Tag_ReadCommandSendR Bit VAR_GLOBAL M1 01<br>3 bRun_SendClass3_TagWrite Bit VAR_GLOBAL M1 10<br>4 bOK_SendClass3_TagWrite Bit VAR_GLOBAL M1 20<br>5 bNG_SendClass3_TagWrite Bit VAR_GLOBAL M1 30<br>6 bRun_SendClass3_TagRead Bit VAR_GLOBAL M1 11<br>7 bOK_SendClass3_TagRead Bit VAR_GLOBAL M1 21<br>8 bNG_SendClass3_TagRead Bit VAR_GLOBAL M1 31<br>9 unSetClass3_Tag_WriteRequestDat Word [Unsigned]/Bit String [16-bit](0.706) VAR_GLOBAL D1 000<br>10 unGetClass3_Tag_ReadResponseD Word [Unsigned]/Bit String [16-bit](0.706) VAR_GLOBAL D2000<br>11 unSetRequestNo_Write Word [Unsigned]/Bit String [16-bit] VAR_GLOBAL D3100<br>12 unGetErrorCode_TagWrite Word [Unsigned]/Bit String [16-bit] VAR_GLOBAL D3101<br>13 unGetStatusErrorCode_TagWrite Word [Unsigned]/Bit String [16-bit] VAR_GLOBAL D3102<br>14 unSetRequestNo_Read Word [Unsigned]/Bit String [16-bit] VAR_GLOBAL D3200<br>15 unGetErrorCode_TagRead Word [Unsigned]/Bit String [16-bit] VAR_GLOBAL D3201<br>16 unGetStatusErrorCode_TagRead Word [Unsigned]/Bit String [16-bit] VAR_GLOBAL D3202<br>17 unGetResponseDataSize_TagRead Word [Unsigned]/Bit String [16-bit] VAR_GLOBAL D3204<br>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.<br>MELSEC iQ-F FX5 User's Manual (Application) | | |
| FBs to be used | • M+FX5-EIP_Class3Originator_WriteTagData<br>• 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 sent to the server side.
When M120 is on, the set size of data stored in D1000 or later is written to Tag001 on the server side as the parameters for Class3 communications.

(1158) By turning on M101, "M+FX5-EIP_Class3Originator_ReadTagData" is executed and a Read request is sent to the server side.
When M121 is on, the server-side response result is stored in D2000 or later according to the response data size stored in D3204.

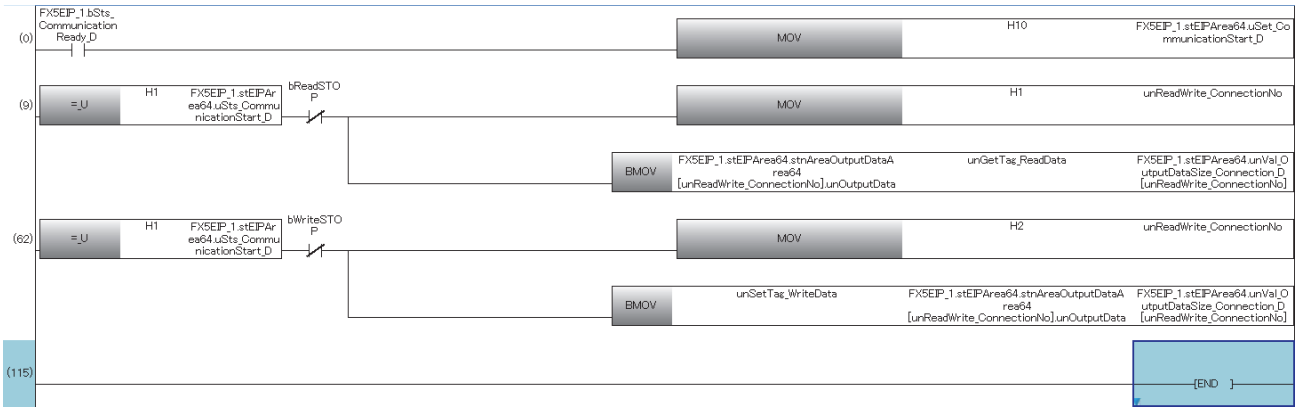
**Point**

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.<br>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.<br>MELSEC iQ-F FX5 User's Manual (Application) | | |

| | 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 |




(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.

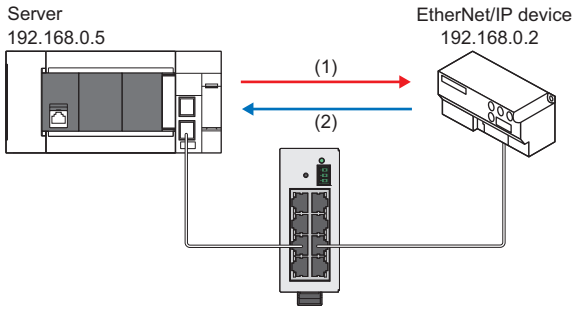
(62) Specify the connection number set for the tag with which to update the current value, and update the data set for the specified tag to the data set in D1000.

# 8.7 Program Example of PING Test

This section provides a program example of PING tests.

## System configuration

The following system configuration is used to explain 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 performed by transmitting an echo request from the FX5-EIP to the EtherNet/IP device and checking the reception of the echo response from the 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.

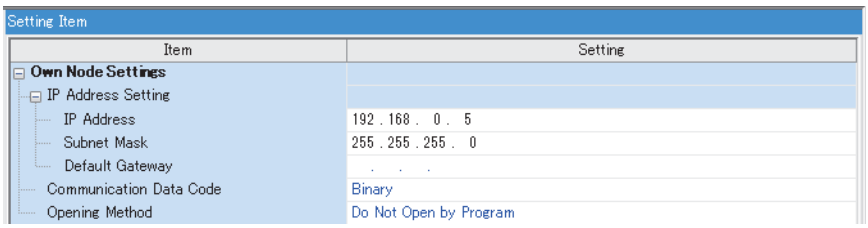
| Address | Item | | Reference |
|---|---|---|---|
| Un\G240 | PING test request area | Communication time check | ☞ Page 236 PING test request area |
| Un\G241 | | Transmission count | |
| Un\G242 to Un\G243 | | IP Address | |
| Un\G244 | PING test response area | Total packet transmission count | ☞ 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]




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]

**Point**

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.

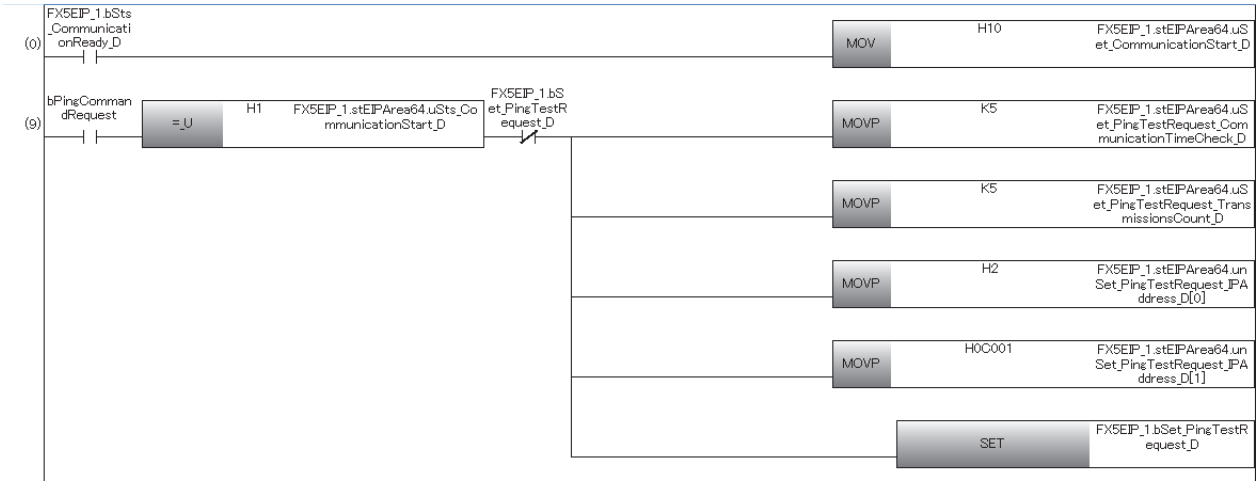
☞ Page 89 PARAMETER SETTINGS

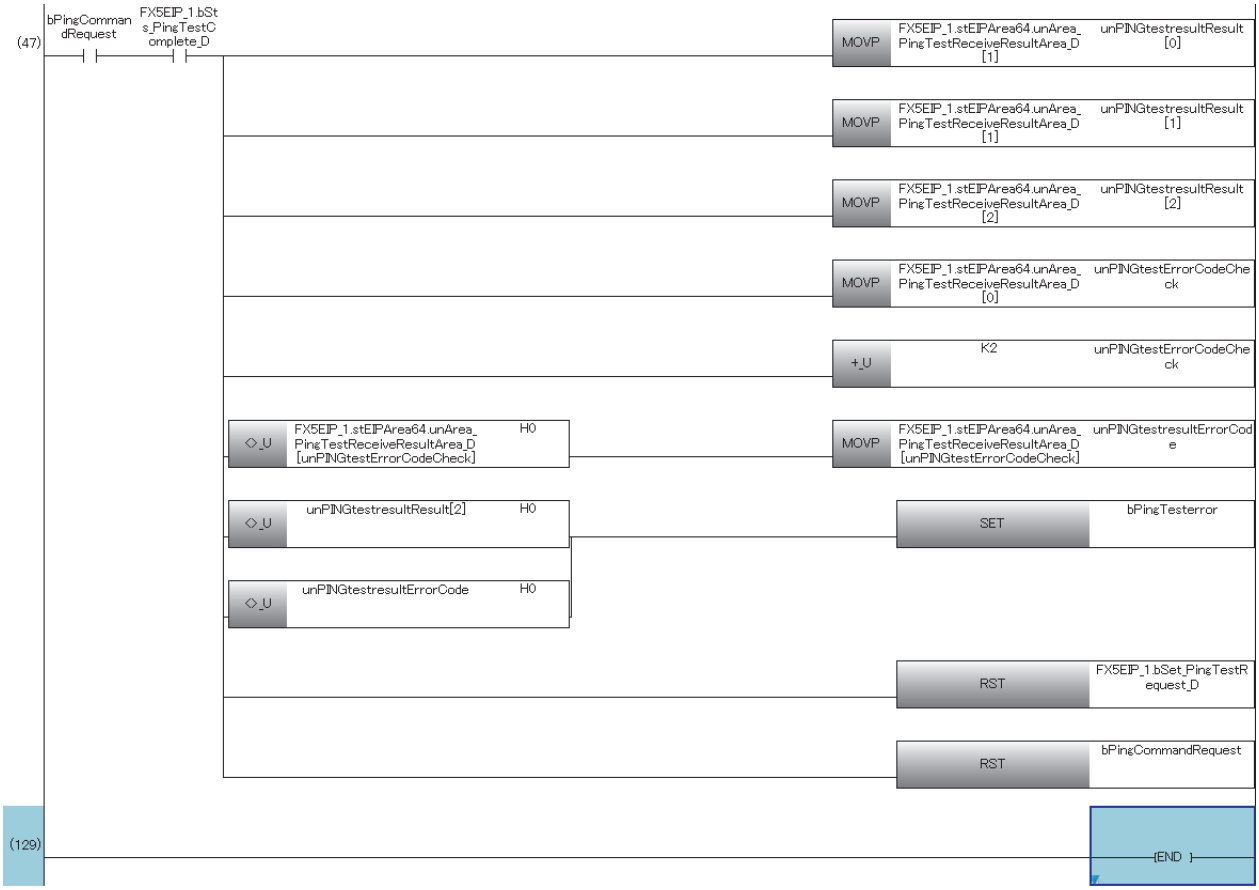
# Program example

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_PingTestReceiveResulteArea_D[0] | PING test response result area total packet transmission count | U1\G244 |
| | FX5EIP_1.stEIPArea64.unArea_PingTestReceiveResulteArea_D[1] | PING test response result area receive count | U1\G245 |
| | FX5EIP_1.stEIPArea64.unArea_PingTestReceiveResulteArea_D[2] | PING test response result area loss count | U1\G246 |
| | FX5EIP_1.stEIPArea64.unArea_PingTestReceiveResulteArea_D[unPINGtestErrorCodeCheck] | 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.<br>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.<br>📖 MELSEC iQ-F FX5 User's Manual (Application) | | |

| | Label Name | Data Type | | Class | Assign (Device/Label) |
|---|---|---|---|---|---|
| 1 | bPingCommandRequest | Bit | ... | VAR_GLOBAL | M0 |
| 2 | unPINGtestresultResult | Word [Unsigned]/Bit String [16-bit](0..2) | ... | VAR_GLOBAL | D3000 |
| 3 | unPINGtestErrorCodeCheck | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3003 |
| 4 | unPINGtestresultErrorCode | Word [Unsigned]/Bit String [16-bit] | ... | VAR_GLOBAL | D3004 |
| 5 | bPingTesterror | Bit | ... | VAR_GLOBAL | F0 |






(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, turn on F0.

# 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 mounted correctly? | If not, properly mount the FX5-EIP on 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 with "EtherNet/IP Configuration"? | Set the parameters with "EtherNet/IP Configuration" if they have not been set. |
| Are the parameters written correctly? | • Check if an error has occurred during writing to the programmable controller.<br>• 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 normally?<br>• 'Cyclic communication status' (Un\G1328 to Un\G1351)<br>• '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)? | • Check that a value other than 0 (start request) is set for "EtherNet/IP communication start request' (Un\G272).<br>• Write the module extension parameter if it is not written.<br>• 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? | • Check whether the operating status of the EtherNet/IP device is normal. (☞ Page 180 Module diagnostics)<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time. |

## 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? | • Connect the Ethernet cable again.<br>• 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".<br>• Model and name of the connected EtherNet/IP device<br>• IP address of the connected EtherNet/IP device<br>• Version of the registered EDS file |
| Are there any errors in the program? | • Check that 'EtherNet/IP communication start request' (Un\G272) is on.<br>• 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

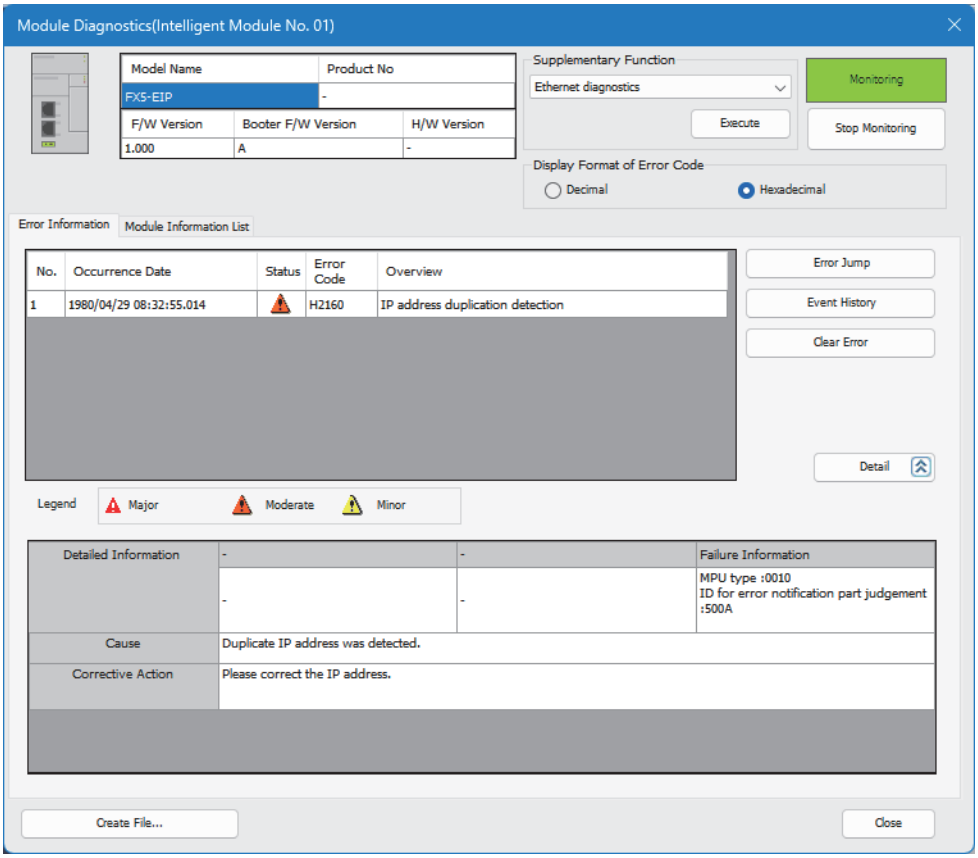
The following functions can be used in the "Module Diagnostics" window for the FX5-EIP.

| Function | Application |
|---|---|
| Error Information | Displays the details of the errors currently occurring.<br>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.

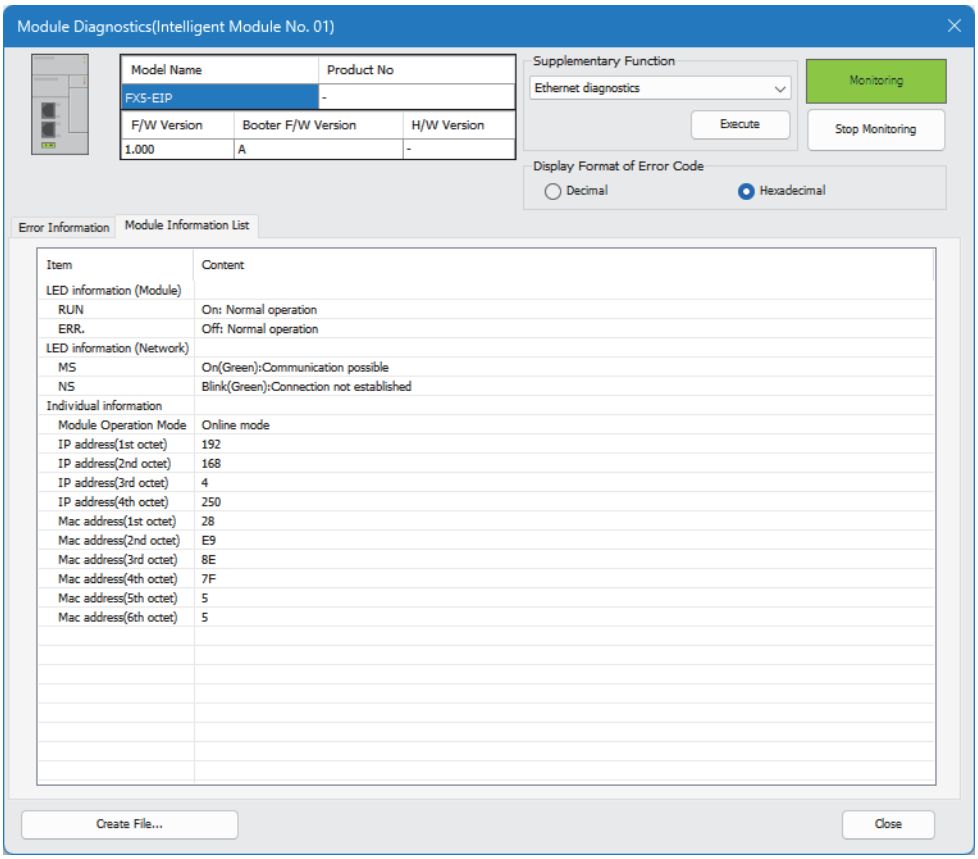
Access [Diagnostic] ⇨ [System Monitor], and double-click "FX5-EIP".




| 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.




| 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 general-purpose 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

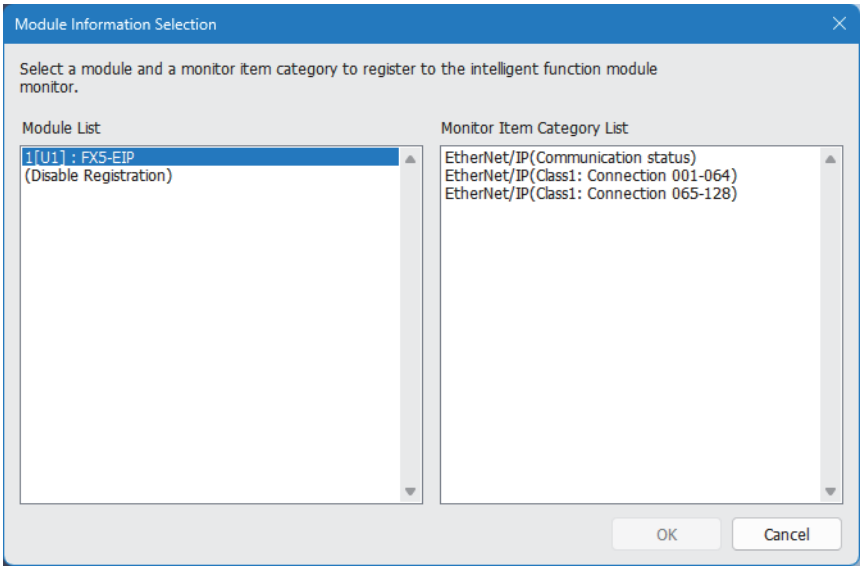
## Intelligent function module monitor

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.<br>☞ Page 244 Cyclic communication status |
| Un\G1336 to Un\G1343 | Error status | Allows checking for errors in each connection.<br>☞ 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.<br>☞ 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

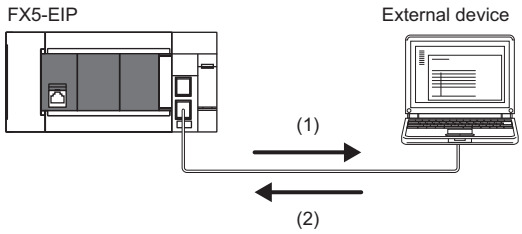
Error details on each connection can be checked with 'Connection error status' (Un\G1392 to Un\G1903).

☞ 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 sends a packet to the EtherNet/IP device to check its existence (an echo request). Then, the FX5-EIP checks whether communication is possible by seeing 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] ⇨ [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 resetting does not cause the RUN LED to turn on, 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 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 (Starting)? | • Check that a value other than 0 (start request) is set for "EtherNet/IP communication start request' (Un\G272).<br>• Write the module extension parameter if it is not written.<br>• 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? | • 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<br>• 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? | • 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.<br>• 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? | • Match the settings of the FX5-EIP with those of other originators that are being communicated with.*1<br>• Match the settings of other originators that are being communicated with the external device with those of the FX5-EIP.<br>• 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".<br>When the following module function blocks are used, check the values set for the arguments.<br>• Class3Originator_ReadTagData<br>• 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? | • Check that "0002H: Class3" is set as the initial value for the communication method specification area of the message communication area*1.<br>• 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.<br>(☞ 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.<br>If the value is other than 0, check the error code and take an action.<br>(☞ 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.<br>• When the FX5-EIP is a client, correct the data type of the tag set in the buffer memory.<br>• 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? | • Check that "0001H: UCMM communications" is set as the initial value for the communication method specification area of the message communication area*1.<br>• 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.<br>(☞ 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.<br>If the value is other than 0, check the error code and take an action.<br>(☞ 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 (Starting)? | • Check that a value other than 0 (start request) is set for "EtherNet/IP communication start request' (Un\G272).<br>• Write the module extension parameter if it is not written.<br>• 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 with the manual for the external device that an instance ID receivable by the external device is set to the FX5-EIP (originator).<br>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? | • Match the settings of the FX5-EIP with those of other originators that are being communicated with.*2<br>• Match the settings of other originators that are being communicated with the external device with those of the FX5-EIP.*2*3<br>• 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 sent a command listed among the message communication support commands.<br>(☞ Page 254 Details of Message Communication Support Command) |
| Are the settings in "EtherNet/IP Configuration" correct? | Check the values set in "EtherNet/IP Configuration".<br>When the following module function blocks are used, check the values set for the arguments.<br>• Class3Originator_MessageSend |
| When the FX5-EIP is a client, is an area not available for Class3 used? | • Check that "0002H: Class3" is set as the initial value for the communication method specification area of the message communication area*1.<br>• 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.<br>If the value is other than 0, check the error code and take an action.<br>(☞ 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? | • Check the value set for the message communication area.*1<br>• 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 sent a command listed among the message communication support commands.<br>(☞ 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? | • Check that "0001H: UCMM communications" is set as the initial value for the communication method specification area of the message communication area*1.<br>• 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.<br>If the value is other than 0, check the error code and take an action.<br>(☞ 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? | • Check that the EtherNet/IP devices to be detected have started up.<br>• 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? | • Check that the EtherNet/IP devices to be detected are linked up.<br>• 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: Starting".<br>• 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? | • Check if the EtherNet/IP device to be detected belongs to a network that is different from the FX5-EIP.<br>• 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? | • 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.<br>• 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? | • 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.<br>• 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 assurance is being performed" when a value other than "0: Auto refresh is not set." is stored in 'Auto refresh processing' (Un\G228)? | Take either or both of the following actions.<br>• From the module parameter, access "Basic Settings" ⇨ "EtherNet/IP Setting" ⇨ "Refresh Settings", and set the auto refresh to "Disabled".<br>• 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 assurance is being performed" when a value other than "0: Auto refresh is not set." is stored in 'Auto refresh processing' (Un\G228)? | Take either or both of the following actions.<br>• From the module parameter, access "Basic Settings" ⇨ "EtherNet/IP Setting" ⇨ "Refresh Settings", and set the auto refresh to "Disabled".<br>• 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 | • The information is displayed in the "Ethernet Diagnostics" window of the FX5-EIP.<br>• 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 SLMPSND instruction completion with an error | The information is stored in the completion status, which is located in the control data of the SLMPSND instruction setting data. | ☞ Page 199 Error codes upon SLMPSND 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) | • The information is stored in the result storage area of the message communication area (response area).<br>• 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. | • Check the operation of the external device.<br>• Check if the connection cable is disconnected. |
| 0904H | Socket communication sending failure | Sending a message over socket communication failed. | • Check the operation of the external device.<br>• 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. | • Execute the IP address change function again.<br>• 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. | • Execute the hardware test.<br>• 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. | • Use "EtherNet/IP Configuration" to write the parameters to the module again.<br>• Execute the hardware test.<br>• 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. | • Execute the hardware test.<br>• 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. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. 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. | • Execute the write to program again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. 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. | • Execute the write to program again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. 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. | • Reset the CPU module, and execute it again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| 1DC4H | IP address change fails | The IP address change has failed. | • Execute the IP address change function again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| 1F00H | MELSOFT communication error | A communication error occurred in the MELSOFT connection. | • Check the number of connections in the whole MELSOFT connection.<br>• 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. | • Check the external device configuration settings in the FX5-EIP module parameters.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| 2C81H | Parameter error | A parameter error was detected in the external device configuration. | • Check the external device configuration settings in the FX5-EIP module parameters.<br>• 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.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| 2C82H | Parameter error | A parameter error was detected in the external device configuration. | • Check the external device configuration settings in the FX5-EIP module parameters.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. 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. | Reexamine 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. | Reexamine and correct the setting of the communication method in the external device configuration in the FX5-EIP module parameters. |
| 2DA3H | Parameter error | A parameter error was detected in the external device configuration. | Reexamine 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. | Reexamine 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. |

| Error code | Error name | Error details and causes | Action |
|---|---|---|---|
| 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 existence confirmation 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 out 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. | • Set the parameters for the CPU module.<br>• 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". | • 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".<br>• 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.<br>• Use "EtherNet/IP Configuration" to write the parameters to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| 31E2H | EtherNet/IP communication parameter error | An error was detected in the parameters set in "EtherNet/IP Configuration". | • Use "EtherNet/IP Configuration" to write the parameters to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. 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. | • Take measures to reduce noise.<br>• 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. | • Take measures to reduce noise.<br>• 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. | • Take measures to reduce noise.<br>• 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 sent to the external device. | • Check the operation of the external device.<br>• Check the condition of the cables, industrial switches, and routers on the lines to the external devices.<br>• The line may be flooded with packets. Retry after a while.<br>• 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 sent from the FX5-EIP.<br>• 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. | • Check the operation of the external device.<br>• 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.) | • Check the operation of the external device.<br>• 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. | • Check the operation of the external device.<br>• Check the condition of the cables, industrial switches, and routers on the lines to the external devices.<br>• If this error occurs during communication, retry after a while. |
| C012H | Error during execution of dedicated instruction | • The port number already used in the open completion connection of TCP/IP is set.<br>• 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. | • Check the operation of the external device.<br>• Check the open processing of the external device.<br>• Correct the open setting of the communication parameter.<br>• Check the port number of the EtherNet/IP module, the IP address/port number of the external device, and the open method.<br>• Check if the connection cable is disconnected. |
| C020H | Error during execution of dedicated instruction | The data length exceeds an allowable range. | • Correct the data length.<br>• If the amount of data to be sent exceeds the prescribed amount, divide and send the data. |
| C023H | Error during execution of dedicated instruction | • The open processing of the corresponding connection has not been completed.<br>• The corresponding connection is closed. | Perform the open processing for the corresponding connection. |
| C027H[*1] | Error during execution of dedicated instruction | Sending a message over socket communication failed. | • Check whether the external device and industrial switch are operating normally.<br>• Since there may be congestion of packets on the line, send the data after a certain period of time.<br>• Check if the connection cable is disconnected.<br>• Check that there is no connection failure with the industrial switch.<br>• Execute the communication status test, and if the test is completed with an error, take corrective action.<br>• Execute the module communication test, and check that there is no failure in the module.<br>• 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. | • Check the operation of the external device.<br>• Reexamine and change the set values for existence confirmation.<br>• Check if the connection cable is disconnected. |

| Error code | Error name | Error details and causes | Action |
|---|---|---|---|
| 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 sent from the external device. |
| 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 send 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 read or write all at once, and send 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 send 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 read or write all at random, and send 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 reexamining and correcting the content of the text or the request data length in the header, resend the message to the EtherNet/IP module. |
| C059H | Ethernet communication error | • The specified command and subcommand are incorrect.<br>• There is a command or subcommand that cannot be used by the EtherNet/IP module. | • Review and correct the request contents.<br>• Send 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 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 resend it to the EtherNet/IP module. (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. | • Increase the monitoring timer value.<br>• 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 resend it to the EtherNet/IP module. (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 reexamining and correcting the content of the text or the request data length in the header, resend the message to the EtherNet/IP module. |
| 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.) | • Send a request message that is adapted to the setting of the communication data code.<br>• 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. | • Check the operation of the external device or industrial switch.<br>• Since there may be congestion of packets on the line, send the data after a certain period of time.<br>• Check if the connection cable is disconnected.<br>• Check that there is no connection failure with the industrial switch.<br>• Execute the communication status test, and if the test is completed with an error, take corrective action.<br>• Execute the module communication test, and check that there is no failure in the module. |
| C1A4H | Ethernet communication error | • The operator tried to use the Ethernet diagnostics by connecting directly to the Ethernet port of the FX5-EIP.<br>• A function not supported by the target device was executed. | • Reexamine and correct the general data command, application type, group, and global specification.<br>• 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. |

| Error code | Error name | Error details and causes | Action |
|---|---|---|---|
| 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. |
| 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 send/receive instruction. | • Change the channel number.<br>• Execute after the send/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 SLMPSND. | • Execute the instruction again after correcting the request data so that the response data length falls within the range.<br>• 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. | • Do not specify the direct connection when MELSOFT is not directly connected.<br>• For direct connection, do not turn off or reset the CPU module or disconnect the cable during communication. |

*1 For errors that occur in SLMPSND, refer to ☞ Page 199 Error codes upon SLMPSND 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 setting or other (Un\G50 to Un\G55) value exceeds the setting range. | Correct the IP address setting or other (Un\G50 to Un\G55) value. |
| 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 | • The IP Address setting in the PING test request area is incorrect.<br>• A PING test is in progress. | • 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.<br>• The IP Address of the own node cannot be set. Set the IP Address of the external device. |

# Error codes upon SLMPSND instruction completion with an error



Error codes upon SLMPSND instruction completion with an error are stored in the completion status, which is located in the control data of the SLMPSND instruction setting data.

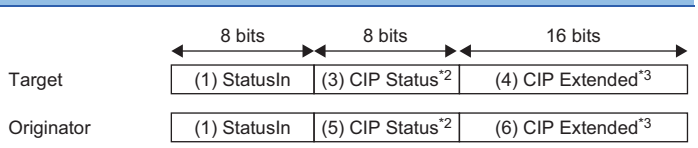
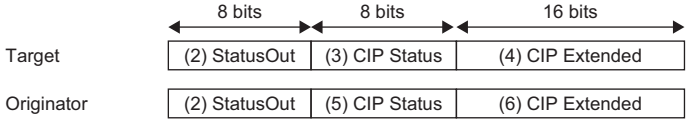
| Error code | Error name | Error details and causes | Action |
|---|---|---|---|
| C027H*1 | Error during execution of dedicated instruction | Sending a message over SLMP communication failed. | • Check whether the external device and industrial switch are operating normally.<br>• Since there may be congestion of packets on the line, send the data after a certain period of time.<br>• Check if the connection cable is disconnected.<br>• Check that there is no connection failure with the switching hub.<br>• 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 SLMPSND. | • Execute the instruction again after correcting the request data so that the response data length falls within the range.<br>• 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 resends is incorrect. | Correct the specified number of resends. |
| 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. | • Execute the instruction again after correcting the execution or error completion type in the control data.<br>• 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. | • Execute the instruction again after a while.<br>• 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. | • Execute again after correcting the port number of the target station in the setting data.<br>• 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 sent correctly via UDP/IP. | • 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).<br>• Since there may be congestion of packets on the line, send the data after a certain period of time.<br>• Execute the PING test and communication status test, and if the test is completed with an error, take corrective action.<br>• 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 |  |
| Un\G1394 to 1395 | | Connection No.2 | |
| ⋮ | | ⋮ | |
| Un\G1518 to 1519 | | Connection No.64 | |
| ⋮ | | ⋮ | |
| Un\G1646 to 1647 | | Connection No.128 | |
| Un\G1648 to 1649 | Output | Connection No.1 |  |
| Un\G1650 to 1651 | | Connection No.2 | |
| ⋮ | | ⋮ | |
| Un\G1774 to 1775 | | Connection No.64 | |
| ⋮ | | ⋮ | |
| 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. | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. 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.<br>Check for errors in the line status.<br>The line may be busy, so retry at a later time. |
| | | 0000H | Stop of Class1 communications | Class1 communications are stopped. | Check whether the buffer memory area 'EtherNet/IP communication start request' is set to "ON".<br>Check that the buffer memory area 'Cyclic communication pause specification' is set to "Cyclic communication pause not requested". |
| 41H (scanner)<br>51H (adapter) | 01H | 0100H | CIP Extended error | The scanner requested ForwardOpen with the same settings as the currently ongoing communication connection. | • 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™)".<br>• Close the connection of the external device and retry.<br>• Retry after the connection of the external device has timed out. |
| | | 0103H | CIP Extended error | Among 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. | ■If the FX5-EIP module is operating as a scanner<br>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™)".<br>■If the FX5-EIP module is operating as an adapter<br>During Class3 communications, only "2: Application Trigger" can be accepted as the "Production Trigger (transmission trigger)" value of "Transport Type/Trigger" of ForwardOpen requested by the scanner. Correct the request according to the documentation, such as the manual of the external device. |

| Error code | | | Error name | Error details and causes | Action |
|---|---|---|---|---|---|
| (1) or (2) | (3) or (5) | (4) or (6) | | | |
| 41H (scanner)<br>51H (adapter) | 01H | 0106H | CIP Extended error | A mismatch in property rights has occurred. | When an Exclusive Owner is used, the adapter can receive only one communication for "Instance ID" set in "Output (O->T)" at a time.<br>■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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".<br>• 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™)".<br>■If the FX5-EIP module is operating as an adapter<br>• Check that the IP address specified by the scanner as the communication destination is correct.<br>• Check whether "Instance ID" of the parameter requested by the scanner is correct.<br>• Check whether "Application Type" of the parameter requested by the scanner is correct.<br>• 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".<br>• The FX5-EIP module does not use the configuration (default 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. | Check the following items, and then restart the EtherNet/IP communications.<br>• Is the operating status of the external device normal?<br>• Is the line status normal? |
| | | 0112H | CIP Extended error | Among the requested parameters, the requested packet interval (RPI) has an unsupported value. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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.<br>■If the FX5-EIP module is operating as an adapter<br>• Of the parameters requested by the scanner, set the RPI to the minimum value (2 milliseconds) or higher.<br>• Among the parameters requested by the scanner, set the RPI to the maximum value (60 seconds) or lower.<br>• 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)<br>51H (adapter) | 01H | 0113H | CIP Extended error | The number of connections has reached the upper limit. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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™)".<br>■If the FX5-EIP module is operating as an adapter<br>A new connection cannot be made because 'Number of consumed connections' (Un\G110116) has reached the upper limit. Reduce the number of connections. |
| | | 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. | • When Listen Only is used, a connection other than Listen Only must already be established on the adapter device. Correct the parameters.<br>• 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 | Among the requested parameters, Inhibit Time is greater than the RPI. | ■If the FX5-EIP module is operating as a scanner<br>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™)".<br>■If the FX5-EIP module is operating as an adapter<br>• Set "Inhibit Time" of the parameter requested by the scanner to be smaller than "RPI of T -> O".<br>• 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 | Among the requested parameters, the transport class (communication method such as Class1/Class3) is not supported. | ■If the FX5-EIP module is operating as a scanner<br>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".<br>■If the FX5-EIP module is operating as an adapter<br>• 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".<br>• 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)<br>51H (adapter) | 01H | 011DH | CIP Extended error | Among the requested parameters, the transmission trigger (Cyclic/Application Trigger/Change of State) is not supported. | ■If the FX5-EIP module is operating as a scanner<br>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".<br>■If the FX5-EIP module is operating as an adapter<br>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™)". |
| | | 011EH | CIP Extended error | Among the requested parameters, the Direction (client/server) is not supported. | ■If the FX5-EIP module is operating as a scanner<br>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™)".<br>■If the FX5-EIP module is operating as an adapter<br>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™)". |
| | | 011FH | CIP Extended error | Among the requested parameters, O->T Fixed/Variable flag is not supported. | ■If the FX5-EIP module is operating as a scanner<br>• 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".<br>• 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".<br>• 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™)".<br>■If the FX5-EIP module is operating as an adapter<br>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". |

| Error code | | | Error name | Error details and causes | Action |
|---|---|---|---|---|---|
| (1) or (2) | (3) or (5) | (4) or (6) | | | |
| 41H (scanner)<br>51H (adapter) | 01H | 0120H | CIP Extended error | The requested T->O Fixed/ Variable flag is not supported. | ■If the FX5-EIP module is operating as a scanner<br>• 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".<br>• 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".<br>• 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™)".<br>■If the FX5-EIP module is operating as an adapter<br>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". |
| | | 0123H | CIP Extended error | Among the requested parameters, the O->T Connection Type (output mode such as Point to Point/ Multicast) is not supported. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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™)".<br>■If the FX5-EIP module is operating as an adapter<br>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". |
| | | 0124H | CIP Extended error | Among the requested parameters, the T->O Connection Type (input mode such as Point to Point/ Multicast) is not supported. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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™)".<br>■If the FX5-EIP module is operating as an adapter<br>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". |
| | | 0125H | CIP Extended error | Of the requested parameters, Redundant Owner is not supported. | ■If the FX5-EIP module is operating as a scanner<br>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™)".<br>■If the FX5-EIP module is operating as an adapter<br>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)". |

| Error code | | | Error name | Error details and causes | Action |
|---|---|---|---|---|---|
| (1) or (2) | (3) or (5) | (4) or (6) | | | |
| 41H (scanner)<br>51H (adapter) | 01H | 0126H | CIP Extended error | The data size that was set in the configuration instance was an unacceptable value. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• Check the manual of the external device, and if the configuration (initial parameter) does not need 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.)<br>■If the FX5-EIP module is operating as an adapter<br>The FX5-EIP module does not use the configuration (default 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. |
| | | 0127H | CIP Extended error | Among the requested parameters, the data size that was set in O->T was an unacceptable value. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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.<br>■If the FX5-EIP module is operating as an adapter<br>• Check that the IP address specified by the scanner as the communication destination is correct.<br>• 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.<br>• 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".<br>• 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.<br>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 | Among the requested parameters, the data size that was set in T->O was an unacceptable value. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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.<br>■If the FX5-EIP module is operating as an adapter<br>• Check that the IP address specified by the scanner as the communication destination is correct.<br>• 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.<br>• 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)<br>51H (adapter) | 01H | 0129H | CIP Extended error | The configuration instance does not exist (incorrect configuration instance ID was specified). | ■If the FX5-EIP module is operating as a scanner<br>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.<br>■If the FX5-EIP module is operating as an adapter<br>The FX5-EIP module does not use the configuration (default 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. |
| | | 012AH | CIP Extended error | An invalid Consumer application path (instance ID of O->T) or tag name was requested. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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.<br>• 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.<br>• 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.<br>■If the FX5-EIP module is operating as an adapter<br>• Check that the IP address specified by the scanner as the communication destination is correct.<br>• 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".<br>• 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.<br>• 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".<br>• 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. | ■If the FX5-EIP module is operating as a scanner<br>• 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.<br>• 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.<br>• 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.<br>• 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.<br>■If the FX5-EIP module is operating as an adapter<br>• Check that the IP address specified by the scanner as the communication destination is correct.<br>• Check whether "Instance ID" of the parameter requested by the scanner is registered in the connection settings (adapter) in "EtherNet/IP Configuration".<br>• 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 | Among the requested parameters, the Fixed/Variable flag did not match the value that was set in the connection of the already ongoing multicast communication. | For new participation in the ongoing multicast communication, the Fixed/Variable flag must match the existing communication.<br>■If the FX5-EIP module is operating as a scanner<br>• 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".<br>• 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".<br>■If the FX5-EIP module is operating as an adapter<br>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". |
| | | 0136H | CIP Extended error | Among the requested parameters, the Priority did not match the value that was set in the connection of the already ongoing multicast communication. | For new participation in the ongoing multicast communication, the Priority must match the existing communication.<br>■If the FX5-EIP module is operating as a scanner<br>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 already ongoing multicast communications.<br>■If the FX5-EIP module is operating as an adapter<br>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 already ongoing multicast communication. |

| Error code | | | Error name | Error details and causes | Action |
|---|---|---|---|---|---|
| (1) or (2) | (3) or (5) | (4) or (6) | | | |
| 41H (scanner)<br>51H (adapter) | 01H | 0137H | CIP Extended error | Among the requested parameters, the transport class (Class0/1) did not match the value that was set in the connection of the already ongoing multicast communication. | For new participation in the ongoing multicast communication, the transport class (Class0/1) must match the existing communication.<br>■If the FX5-EIP module is operating as a scanner<br>The FX5-EIP module can be used only for Class1 communications. Change the transport class that was set in the connection of the already ongoing multicast communication to Class1.<br>■If the FX5-EIP module is operating as an adapter<br>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 | Among 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 already ongoing multicast communication. | For new participation in the ongoing multicast communication, the transmission trigger (Cyclic/Application Trigger/Change of State) must match the existing communication.<br>■If the FX5-EIP module is operating as a scanner<br>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 already ongoing multicast communication.<br>■If the FX5-EIP module is operating as an adapter<br>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 already ongoing multicast communication. |
| | | 0139H | CIP Extended error | Among the requested parameters, the Inhibit Time did not match the value that was set in the connection of the already ongoing multicast communication. | For new participation in the ongoing multicast communication, the Inhibit Time must match that of the existing communication.<br>■If the FX5-EIP module is operating as a scanner<br>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 already ongoing multicast communication.<br>■If the FX5-EIP module is operating as an adapter<br>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 | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• 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. | ■If the FX5-EIP module is operating as a scanner<br>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™)".<br>■If the FX5-EIP module is operating as an adapter<br>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™)".<br>• The format of the requested connection path is incorrect.<br>• During Class1 communications, the class ID or instance ID of the connection path was not set.<br>• During Class1 communications, a value other than the Assembly object (class ID: 4) was set as the class ID of the connection path.<br>• During Class3 communications, a value other than the Message Router object (class ID: 2) was set as the class ID of the connection path.<br>• During Class3 communications, a value other than 1 was set as the instance ID of the connection path.<br>• 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 | — | 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™)". |
| | 04H | | | | |
| | 09H | | | | |
| | 0CH | | | | |
| | 10H | | | | |
| | 13H | | | | |
| | 15H | | | | |
| | Except for shown above | — | 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™)".<br>• Stored value in (3) or (5) above: Value of General Status notified by the external device<br>• 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 | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| | | 02BCH | Connection start error | Memory error | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | | 012EH | Connection start error | Specified connection instance ID duplication | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | | 012FH | Connection start error | Invalid target IP address | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| | | 0130H | Connection start error | No TCP/IP interface object for the specified IP address | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| | | 01C3H | Connection start error | "EtherNet/IP Configuration" parameter error | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| 44H (scanner) | 00H | 0002H | Connection error | The target device does not exist. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send data at the specified RPI due to a high communication load, so specify a larger RPI and connect again. |
| | 01H | 0002H | Connection error | The target device does not exist. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send 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. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send 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. | • Check that the Ethernet cable is not disconnected.<br>• Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send 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. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send 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. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send 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. | • Take measures to reduce noise.<br>• 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. | • Take measures to reduce noise.<br>• 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 | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | 20H | 02BCH | Connection error | Memory error | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| 45H (scanner)<br>55H (adapter) | 11H | 0256H | Socket error | Socket generation has failed. | • Retry the operation after a while.<br>• 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. | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | | 0264H | Socket error | Socket option setting error | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | | 0266H | Socket error | Socket option setting error | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | | 0267H | Socket error | Socket option setting error | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please 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)<br>55H (adapter) | 11H | 0257H | Socket error | Socket registration error | • Retry the operation after a while.<br>• 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 | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | | 0263H | Socket error | Socket option setting error | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please contact your local Mitsubishi representative. |
| | | Socket error code | Socket error | IO data send error. The error code obtained from the communication stack was set. | • Retry the operation after a while.<br>• 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. | • Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• 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. | • Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• 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. | • Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• 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. | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. 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".<br>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. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time. |

| 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 | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please contact your local Mitsubishi representative. |
| | | 0133H | Instance registration error | Registration failed because the maximum number of assembly objects has been reached. | • Take measures to reduce noise.<br>• 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 | • Take measures to reduce noise.<br>• 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 | • Take measures to reduce noise.<br>• 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. | • Take measures to reduce noise.<br>• 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 | • Check the parameter set in "EtherNet/IP Configuration" and write the parameter to the module again.<br>• 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. | • Check that the Ethernet cable is not disconnected.<br>• Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send 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. | • Check whether the operating status of the external device is normal.<br>• Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• The external device may not be able to send 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 | • Take measures to reduce noise.<br>• Reset the CPU module and run it again. If the same error occurs again even after taking the above measure, the possible cause is a hardware failure of the module. Please 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. | • Check for errors in the line status.<br>• The line may be busy, so retry at a later time.<br>• 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. | • Check the value set for the request area.*1<br>• 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. | • Check the settings of the external device.<br>• Check that there is no noise on the line.<br>• 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. | • Check that the area used is correct.<br>• 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". | • Check whether the setting value of the buffer memory area for specifying the communication method of the target connection number in the request area matches the parameter of the target connection set in "EtherNet/IP Configuration".<br>• When Class3 communications are used, set the Class3 communication parameters for the target connection in "EtherNet/IP Configuration".<br>• When UCMM communications are used, no parameters are set for the target connection in "EtherNet/IP Configuration". |
| 0006H | Class3 communications failed. | • Check that the Ethernet cable is not disconnected.<br>• Check that the cable is not disconnected or reconnected during Class3 communications.<br>• Use PING or a similar method to check that a node with the request destination IP address exists on the network.<br>• 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. | • Check whether the "Assurance of input/output data" function is enabled or disabled.<br>• Check "Input data update status" and "Output data update status". |
| 0101H | A request for message communications failed to be sent. | • Check that the Ethernet cable is not disconnected.<br>• Use PING or a similar method to check that a node with the request destination IP address exists on the network.<br>• When Class3 communications are requested, check that the external device supports Class3 communications.<br>• When UCMM communications are requested, check that the external device supports UCMM communications.<br>• Check that there is no noise on the line.<br>• Check whether the external device is operating normally. |
| 0102H | There was no response to the request for message communications. | • Check that the Ethernet cable is not disconnected.<br>• Use PING or a similar method to check that a node with the request destination IP address exists on the network.<br>• Check whether the buffer memory area 'EtherNet/IP communication start request' (Un\G273) is set to "ON".<br>• When Class3 communications are requested, check that the external device supports the Class3 communication server function.<br>• When UCMM communications are requested, check that the external device supports the UCMM communication server function.<br>• Refer to the manual for the external device and check that the external device is ready to receive a request.<br>• Check that the cable is not disconnected or reconnected during Class3 communications.<br>• Check that there is no noise on the line. |
| 0103H | Connection establishment for Class3 communications failed. | • Check that the Ethernet cable is not disconnected.<br>• Check that the request destination IP address set in the Class3 communications parameters is correct.<br>• Check that the external device supports the Class3 communication server function.<br>• Check that the cable is not disconnected or reconnected during Class3 communications.<br>• Check that there is no noise on the line.<br>• Check whether the external device is operating normally. |
| 0104H | There was no response to ForwardOpen for performing Class3 communications. | • Check that the external device supports the Class3 communication server function.<br>• Refer to the manual for the external device and check that the external device is ready to receive a request.<br>• 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. | • Reduce the number of UCMM communication connections being executed simultaneously.<br>• Execute again at a later time. |
| 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. | Take the following action according to the value set in FxxxH (xxx = 000 to 1F0).<br><br>• xxx=000<br>The data size cannot be set to "0" for UCMM tag communications.<br>Check the value set for the data size.<br><br>• Other than xxx = 000<br>A value that has been set exceeds the allowable data size value for UCMM instance communications/UCMM tag communications.<br>The maximum value that can be set for the data size is xxx. Please check the data size set value to ensure it is valid.<br><br>For allowable data size settings for UCMM communications, refer to the following.<br>☞ Page 240 I/O data size |

*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<br>Check that the unconnected send service is not in use.<br>Check that the service code of the request sent 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 sent from the external device (originator) is correct.*3<br>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.<br>Reduce the request data size specified by the external device (originator).<br>Check that the request sent from the external device (originator) is correct.*3 |
| 1FH | 0002H | Vendor specific error | There is a type mismatch between the 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 against 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 sending 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 | — | — |

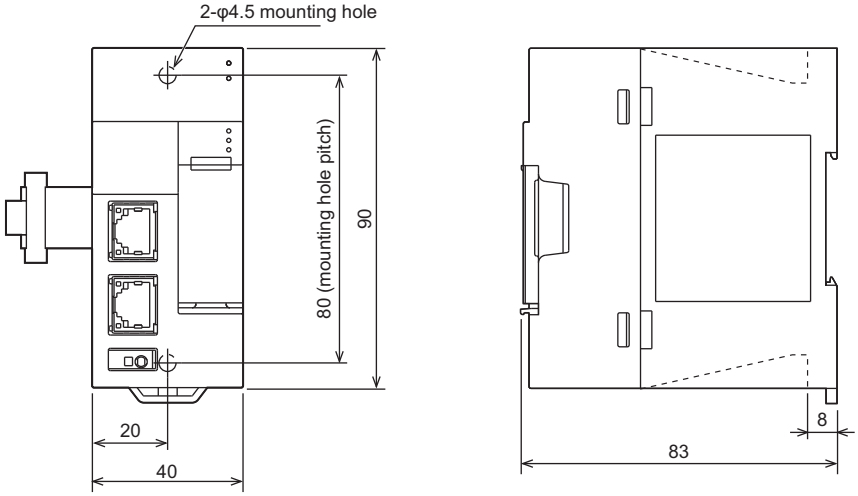
| Event code | Event type | Event category | Event status | Detected event | Detailed information | | |
|---|---|---|---|---|---|---|---|
| | | | | | Detailed information 1 | Detailed information 2 | Detailed information 3 |
| C059 | System | Error | Minor | Ethernet communication error | Parameter information | — | — |
| 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)

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# 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<br>- Equipment requirements and tests | Compliance with all relevant aspects of the standard.<br>EMI<br>• Radiated emission<br>• Conducted emission<br>EMS<br>• Radiated electromagnetic field<br>• Fast transient burst<br>• Electrostatic discharge<br>• High-energy surge<br>• Voltage drops and interruptions<br>• Conducted RF<br>• Power frequency magnetic field |

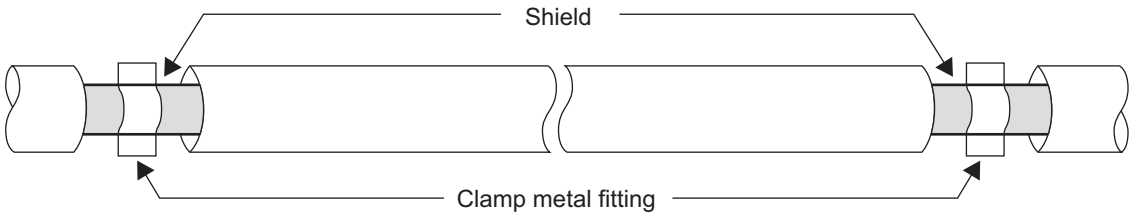
# Caution for compliance with EU Directive

## 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 (6128 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 following is the instance name of the FX5-EIP.

| 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 following shows the classification.

| 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 following shows the classification.

| Data type | Description |
|---|---|
| Val | Display the value of module. |
| Set | Set the module control instruction. |
| Sts | Display the module status. |

### ■Label name

A label name 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 set to their defaults (initial values) when the system is powered off or the CPU module is reset.

## List of buffer memory addresses

64 connections: When the maximum number of connections is 64. 128 connections: When the maximum number of connections is 128. 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 |

A

| 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 |

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| 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 method specification | Class1 communications: 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 | | Message communication areas (2nd to 64th/128th) | | (Refer to the first one.) | — |
| 16944 to 17665 | 32560 to 32859 | 4230H to 4501H | 7F30H to 805BH | Data area | 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<br>• On: An error has occurred (minor/moderate/major)<br>• Off: No error<br>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<br>• On: The module is operable<br>• Off: The module is not operable (in preparation) |
| Un\G35 | b2 | PING test completion | This signal turns on or off depending on the execution status of the PING test.<br>• On: The PING test has completed.<br>• Off: The PING test has not completed. |
| | b15 | Communication Ready | This signal turns on when the FX5-EIP communication preparation has completed.<br>• On: Communication preparation has completed.<br>• Off: Communication preparation is in progress. |

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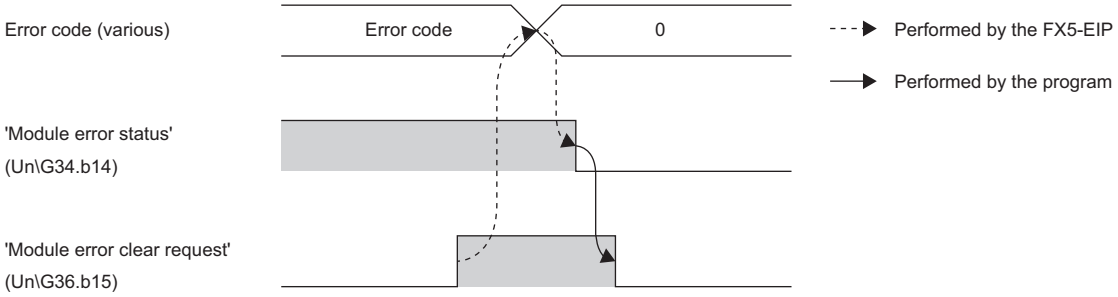
## ■Output signals (Un\G36 to Un\G37)

These signals are used for controlling 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.<br>Issuing the request after the cause of the error is removed will clear the following items.<br>• 'Module error status' (Un\G34.b14) turns on and off.<br>• The ERROR LED is turned off.<br>• The following buffer memory<br>- 'Latest error code' (Un\G29)<br>- 'IP address storage area write error code' (Un\G61)<br>- 'IP address storage area clear error code' (Un\G62)<br>- 'Error code' (Un\G108 to Un\G139)<br>- 'IP address duplication status area' (Un\G201)<br>- 'MAC address of the already connected station' (Un\G202 to Un\G204)<br>- 'MAC address of the station connected later' (Un\G205 to Un\G207) |

**Point**

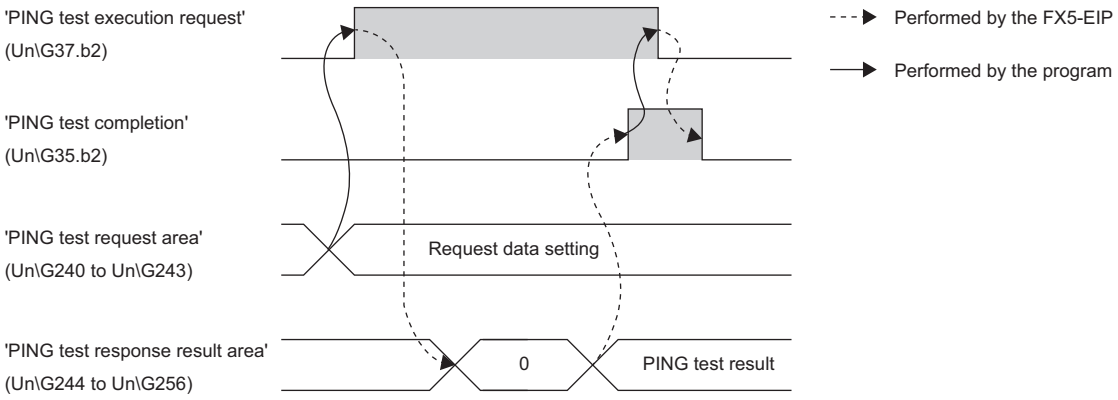
• Turn on and off 'Module error clear request' (Un\G36.b15) at the following timing using 'Module error status' (Un\G34.b14) as an interlock condition.




| Address | bit | Signal name | Description |
|---|---|---|---|
| Un\G37 | b2 | PING test execution request | Turn this signal on to execute a PING test.<br>• On: PING test execution request<br>• Off: Request to complete PING test |

**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)

Stores IP address to be set when using IP address change function.

Stores 0 when writing to IP address storage area is completed normally.

| 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)

Stores subnet mask pattern to be set when using IP address change function.

Stores 0 when writing to IP address storage area is completed normally.

| 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)

Stores default router IP address to be set when using IP address change function.

Stores 0 when writing to IP address storage area is completed normally.

| 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.<br>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 a problem in the contents of the IP address storage area, when the FX5-EIP is powered off and on.<br>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)

Specify 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.<br>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.<br>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)

Stores whether the IP address change function is enabled or not.

- 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)

Stores IP address on the own station set with GX Works3. (☞ 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 set value in GX Works3, clear the IP address storage area.

### ■Subnet mask pattern (Un\G74 to Un\G75)

Stores subnet mask pattern on the own station set with GX Works3. (☞ 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 set 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)

Stores default gateway IP address on the own station set with GX Works3. (☞ 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 set value in GX Works3, clear the IP address storage area.

### ■Ethernet address (MAC address) (Un\G102 to Un\G104)

Stores Ethernet address (MAC address) on the own station.

| 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)

Stores the MELSOFT connection TCP port number.

### ■MELSOFT connection UDP port number (Un\G106)

Stores the MELSOFT connection UDP port number.

### ■MELSOFT direct connection port number (Un\G107)

Stores the MELSOFT direct connection port number.

### ■Error code (Un\G108 to Un\G139)

Stores the error code (connection numbers 1 to 32) of general-purpose Ethernet. (0 is stored when conditions are normal.)

For details on error codes, refer to ☞ Page 192 Module error.

| Address | Description |
|---|---|
| Un\G108 | Stores error code of connection number 1. |
| Un\G109 | Stores error code of connection number 2. |
| ⋮ | |
| Un\G139 | Stores error code of connection number 32. |

### ■Open completion signal (Un\G152 to Un\G153)

Open completion signal for each connection number

| Address | bit | Connection number | Description |
|---|---|---|---|
| Un\G152 | b0 | Connection number 1 | • On: Open completed<br>• 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)

Open request signal for each connection number of socket communication

| Address | bit | Connection number | Description |
|---|---|---|---|
| Un\G154 | b0 | Connection number 1 | • On: Requesting open<br>• Off: No open request |
| | b1 | Connection number 2 | |
| | ⋮ | | |
| | b15 | Connection number 16 | |
| Un\G155 | b0 to b15 | Connection number 17 to 32 | |

### ■Socket communications receive status signal (Un\G156 to Un\G157)

Socket communication receive state signal for each connection number.

| Address | bit | Connection number | Description |
|---|---|---|---|
| Un\G156 | b0 | Connection number 1 | • On: Data reception completed<br>• 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)

Use this status to check whether or not the FX5-EIP has been initialized.

| 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 abnormally completed. |

### ■IP address duplication status (Un\G201)

Same IP address state is stored.

| Address | bit | Name | Description |
|---|---|---|---|
| Un\G201 | b0 | Same IP address detection flag | Turns on if there is a same 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 will be set (other than 0).

- 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)

Sets whether to guarantee 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: Data assurance is not being performed.
- 2: Data assurance is being performed.

## PING test request area

### ■Communication time check (Un\G240)

Sets the PING test 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 5 seconds.

### ■Transmission count (Un\G241)

Sets the transmission count.

- 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)

Sets 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 (IP address where all bits indicating the host[*1] are 0)
- Broadcast address of the network to which the own node belongs (IP address where all bits indicating the host[*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)

Stores the total packet transmission count during PING test execution.

### ■Receive count (Un\G245)

Stores the packet receive count during PING test execution.

### ■Loss count (Un\G246)

Stores the timeout loss count during PING test execution.

The error code is not registered when a timeout loss occurs.

### ■Error code (Un\G247 to Un\G256)

Stores the error codes that occur during PING test execution in 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)

Requests 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)

Determines whether to continue or stop EtherNet/IP communication when the operating status of the CPU module changes from the RUN state to the STOP state or when a stop error occurs on 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)

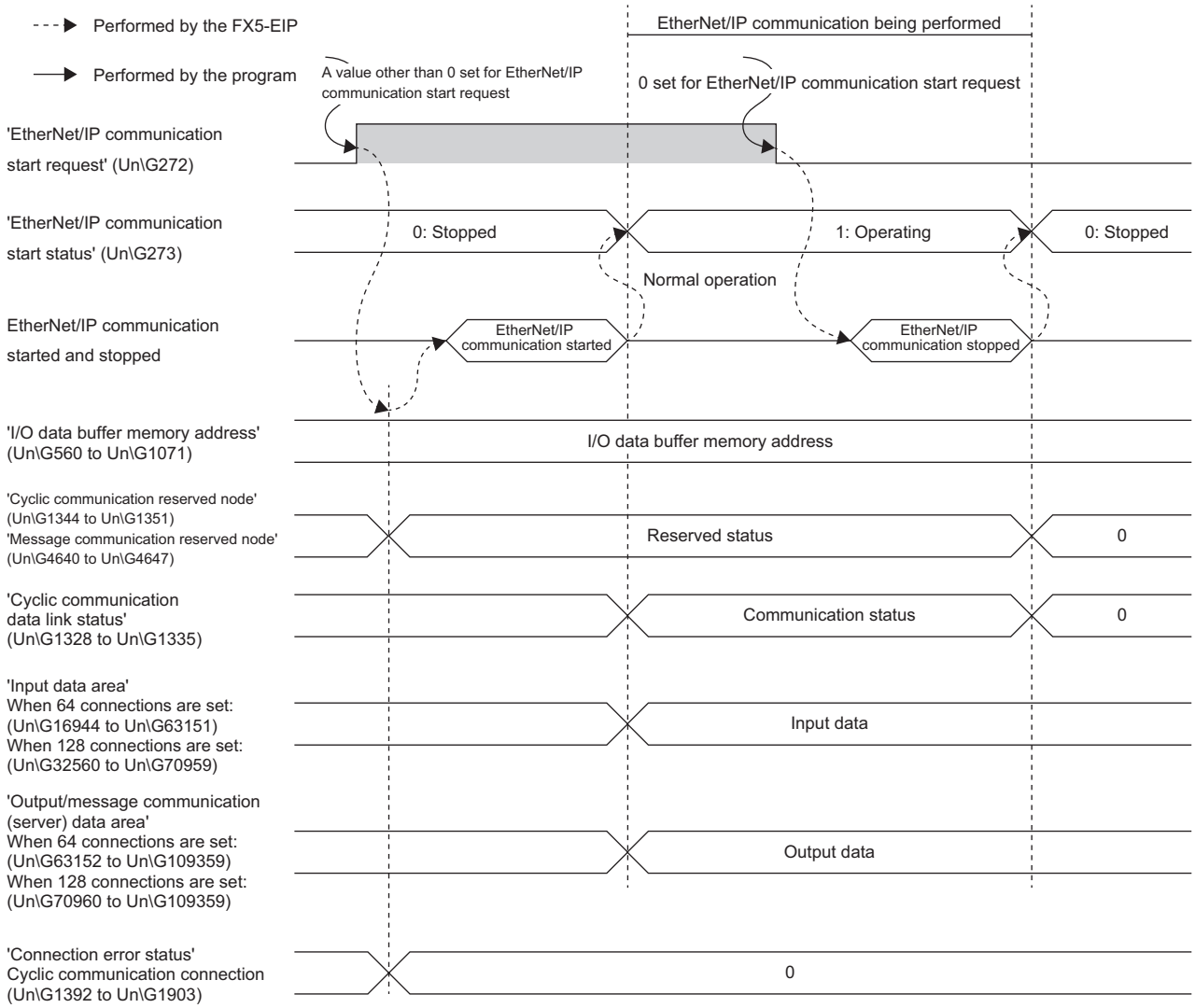
The setting status of 'EtherNet/IP communication continuation specification request' (Un\G274) is stored.
The setting is stored when an EtherNet/IP communication start request is performed.

- 1: Operating with "Continue"
- 2: Operating with "Stop"

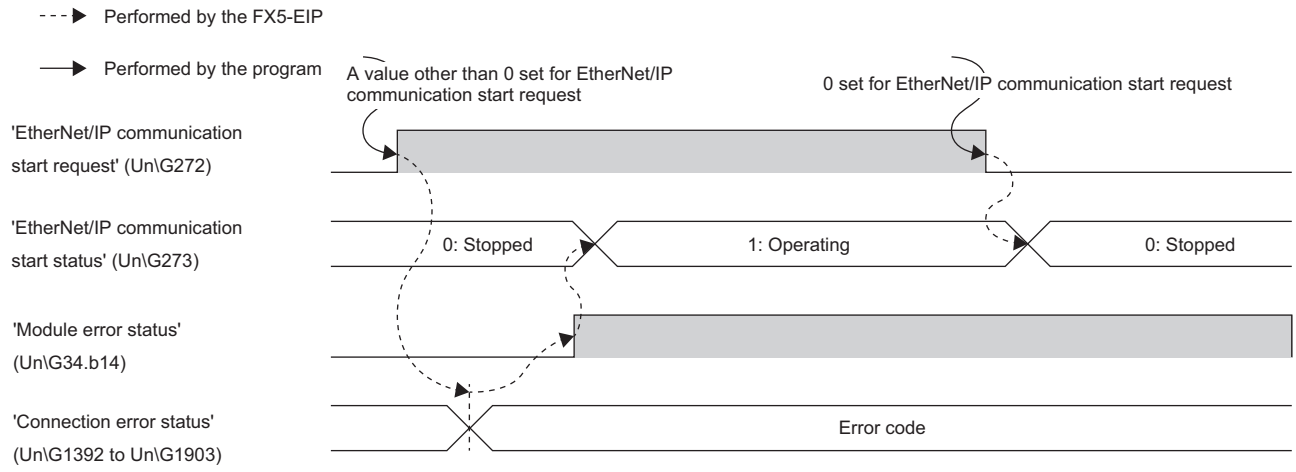
## ■Operation timing of EtherNet/IP communication start request (Un\G272)

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

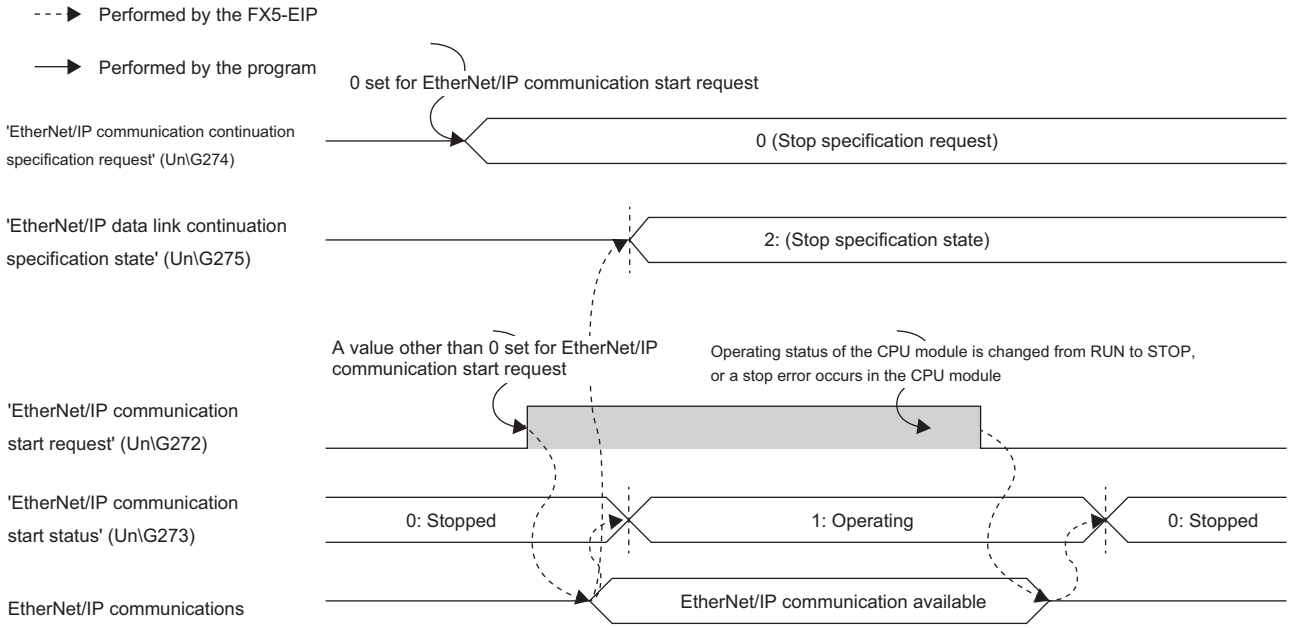
Control of the EtherNet/IP communication available state differs depending on the state of 'EtherNet/IP data link continuation specification state' (Un\G275).

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.)

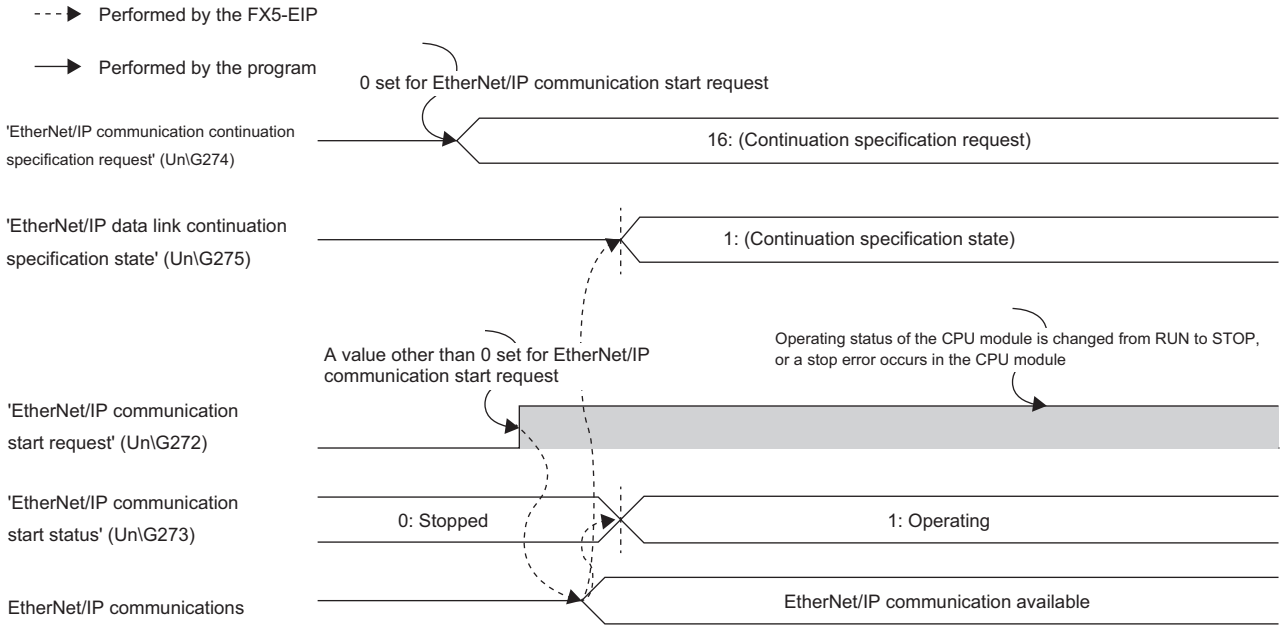
Even when 'EtherNet/IP data link continuation specification state' (Un\G275) is active with "1: Continue" and CPU module changes from RUN to STOP or a stop error occurs in the CPU module, EtherNet/IP communication will continue.

When 'Block assurance state per connection' (Un\G233) is operated by "2: Data assurance is being performed", 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"




A

# 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 | • The receive data size of the response command is stored in units of bytes.<br>For the response data size, refer to the manuals for the EtherNet/IP device of the response command send source and the EtherNet/IP specifications. |
| | When the communication method is tag communication | • For a read request (Service is 'Class3/UCMM Read Originator'), the size of the response data from the sending EtherNet/IP device is stored as the number of data type elements.<br>• 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 sent from the FX5-EIP to the EtherNet/IP device is stored in bytes. |
| During message communication (client function) | Set the request data size.<br>For details on request data size, refer to ☞ Page 124 Buffer memory settings.<br>For the allowable data size settings, refer to ☞ Page 241 Data Size setting range.<br>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 made 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 method 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 method 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<br>Maximum size: 249 |
| | 00C4H (DINT) | | Minimum size: 1 Maximum size: 124 |
| 124DH (Class3/UCMM Write Originator) | 00C3H (INT) | Not available | Minimum size: 1<br>Maximum size: (494 - number of tag name characters) / 2 |
| | | Available | Minimum size: 1<br>Maximum size: (480 - number of tag name characters) / 2 |
| | 0x00C4 (DINT) | Not available | Minimum size: 1<br>Maximum size: (494 - number of tag name characters) / 4 |
| | | Available | Minimum size: 1<br>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 method specification: "0002H: Class3 communications"
- Communication method specification: "0001H: Instance communications"
- 'EtherNet/IP Configuration': parameters set

| 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 method specification: "0002H: Class3 communications"
- Communication method specification: "0002H: Tag communications"
- 'EtherNet/IP Configuration': parameters set

| 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<br>Maximum size: 248 |
| | 00C4H (DINT) | Minimum size: 1<br>Maximum size: 124 |
| 124DH (Class3/UCMM Write Originator) | 00C3H (INT) | Minimum size: 1<br>Maximum size: (492 - number of tag name characters) / 2 |
| | 00C4H (DINT) | Minimum size: 1<br>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 assurance is being performed", 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 assurance is being performed", 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)

Stores the data link status of connection numbers 1 to 128.

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)

Stores the error status of connection numbers 1 to 128. 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)

Stores the setting status of the reserved node of connection numbers 1 to 128.

- 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)

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 |

## Connection behavior error status

### ■Input (Un\G1392 to Un\G1393, Un\G1394 to Un\G1647)

Stores the error code on the input side (when receiving) that occur during cyclic communication in connection numbers 1 to 128. (0 is stored when conditions are normal.)

| Address | Name | Description |
|---|---|---|
| Un\G1392 to Un\G1393 | Connection number 1 | 0: Normal<br>Other than 0: Error code (☞ Page 196 Error codes in status of each connection) |
| Un\G1394 to Un\G1647 | Connection numbers 2 to 128 | |

### ■Output (Un\G1648 to Un\G1649, Un\G1650 to Un\G1903)

Stores the error code on the output side (when sending) that occur during cyclic communication in connection numbers 1 to 128. (0 is stored when conditions are normal.)

| Address | Name | Description |
|---|---|---|
| Un\G1648 to Un\G1649 | Connection number 1 | 0: Normal<br>Other than 0: Error code (☞ Page 196 Error codes in status of each connection) |
| Un\G1650 to Un\G1903 | Connection numbers 2 to 128 | |

### 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)

Stores the connection information for connection number 1 of the cyclic communication.

| Number of words | Name | | Description |
|---|---|---|---|
| 1st to 2nd words | Diagnostic | Production Connection ID | Stores the transmission connection ID for the destination of the requested connection. |
| 3rd to 4th words | | Consumption Connection ID | Stores the receive connection ID for the destination of the requested connection. |
| 5th to 6th words | | O→T API (μs) | Stores the originator to target API (unit: μs) for the destination of the requested connection. |
| 7th to 8th words | | T→O API (μs) | Stores the target to originator API (unit: μs) for the destination of the requested connection. |
| 9th to 10th words | | O→T RPI (μs) | Stores the originator to target RPI (unit: μs) for the destination of the requested connection. |
| 11th to 12th words | | T→O RPI (μs) | Stores the target to originator RPI (unit: μs) for the destination of the requested connection. |
| 13th to 14th words | | O→T Net Parameters | Stores the originator to target network parameter for the destination of the requested connection. |
| 15th to 16th words | | T→O Net Parameters | Stores the target to originator network parameter for the destination of the requested connection. |
| 17th word | | Originator Connection Serial Number | Stores the originator connection serial number. |
| 18th word | | Originator Vendor Id | Stores the originator vendor ID. |
| 19th to 20th words | | Originator Serial Number | Stores the originator serial number. |

### ■Connection numbers 2 to 128 (Un\G1940 to Un\G4479)

Stores the connection information for cyclic communication connection numbers 2 to 128 in the order of 2 to 128.

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 × (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.<br>• On: Requested<br>• Off: Not requested | R/W |
| | b1 | Execution request acceptance | Stores the acceptance status of the message communication execution request.<br>• On: Accepted<br>• Off: Not accepted | R |
| | b2 | Execution completion | Stores the execution status of the message communication.<br>• On: Completed<br>• 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)

Stores the setting status of the reserved node of connection numbers 1 to 128.

• On: Reserved node

• Off: Not set as reserved node

The following shows 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.

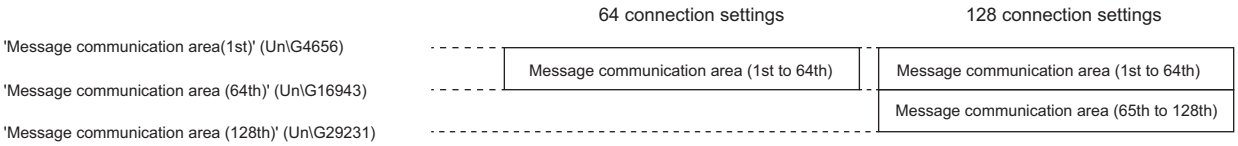
| Address | Name | Description |
|---|---|---|
| Un\G4656 to Un\G4815 | Request area | Stores the message communication request command.<br>For details, refer to ☞ Page 249 Message communication request area. |
| Un\G4816 to Un\G4847 | Response area | Stores the message communication response command.<br>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.<br>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.




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 × (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 is stored in each buffer memory. (Excluding "Communication method 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 method specification | | — | ○ | Specify the communication method.<br>• 0000H: UCMM communications cannot be used.<br>• 0001H: UCMM communications<br>• 0002H: Class3 communications |
| Un\G4657 | Communication method specification | | — | ○ | Specify the communication method.<br>• 0001H: Instance communications<br>• 0002H: Tag communications |
| Un\G4658 | Service | | — | ○ | ■For instance communications<br>Specify the service code of the EtherNet/IP instance communications.<br>• Lower 8 bits: Service code (0H to FFH)<br>Refer to the manual of each EtherNet/IP device for service codes except for the following.<br>• 000EH (Get_Attribute_Single): Obtains the set value of the specified Attribute.<br>• 0010H (Set_Attribute_Single): Sets the value for the specified attribute.<br>■For tag communications<br>Select the tag communication type.<br>• 124CH: Class3/UCMM Read Originator<br>• 124DH: Class3/UCMM Write Originator |
| Un\G4659 onwards Un\G4660 | Target IP address | | — | ○ | Specify the IP address of the EtherNet/IP device to which the request data is sent during message communications.<br>• Range: 0.0.0.1 to 223.255.255.254<br>Specify the IP address from the first octet to the 4th octet as follows.<br>• Lower byte of the first word: Fourth octet<br>• Upper byte of the first word: Third octet<br>• Lower byte of the second word: Second octet<br>• Upper byte of the second word: First octet |
| Un\G4661 | RPI | | ○ | ○ | Set Requested Packet Interval.<br>■Valid range: 00C8H to EA60H (200 to 60000ms)<br>• Class3 communication: Operation is performed with the set value.<br>• UCMM communication: When the trigger specification is set to Cyclic, operation is performed with the set value. When the trigger is Application Trigger, the setting value is not reflected.<br>■Outside the valid range above<br>• Class3 communication: Operation is performed with the parameter setting or the previous setting value.<br>• 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 | | — | — | Set TimeOutMultiplier during Class3 communications.<br>• 0000H: ×4<br>• 0001H: ×8<br>• 0002H: ×16<br>• 0003H: ×32<br>• 0004H: ×64<br>• 0005H: ×128<br>• 0006H: ×256<br>• 0007H: ×512 |
| Un\G4663 | Trigger Type | | — | ○ | Set a transmission trigger.<br>• 0000H: Application Trigger<br>• 0010H: Cyclic |
| Un\G4664 | Path Segment specification | Segment Size | — | ○ | Specify the size of the Path Segment.<br>Unit: Word<br>Range: 0 to 1<br>• 0: Do not use Path Segment.<br>• 1: Use a one-word Path Segment.<br>• 2 or more: Not supported |
| Un\G4665 onwards Un\G4668 | | Path Segment | — | ○ | Specify the Path Segment data to be assigned when connecting.<br>This address is valid when the Path Segment specification (Segment Size) is set to a value other than 0.<br>If Segment Size is 1, set the following values.<br>• Bits 0 to 3: Port number (1 to 14)<br>• Bits 8 to 15: Link address (slot number) |

| Address | Item | Class3 | UCMM | Description |
|---|---|---|---|---|
| Un\G4669 | Data Type | — | ○ | ■For instance communications<br>Not used<br>■For tag communications<br>Set a data type for the request data.<br>• 00C3H: INT (signed 16-bit data)<br>• 00C4H: DINT (signed 32-bit data) |
| Un\G4670 | Class | — | ○ | ■For instance communications<br>Refer to the manuals of the transmission destination EtherNet/IP device. |
| Un\G4671 | Instance | — | ○ | ■For instance communications<br>Refer to the manuals of the transmission destination EtherNet/IP device. |
| Un\G4672 | Attribute | — | ○ | ■For instance communications<br>Refer to the manuals of the transmission destination EtherNet/IP device. |
| Un\G4673 onwards Un\G4800 | Tag Name | — | ○ | ■For tag communications<br>Set the tag name of the destination.<br>• Minimum number of characters: 1 ASCII code character<br>• Maximum number of characters: 255 ASCII code characters<br>For details on the characters that can be used in tag names, refer to ☞ Page 34 Instance ID and tag name. |

*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)".

*2 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.

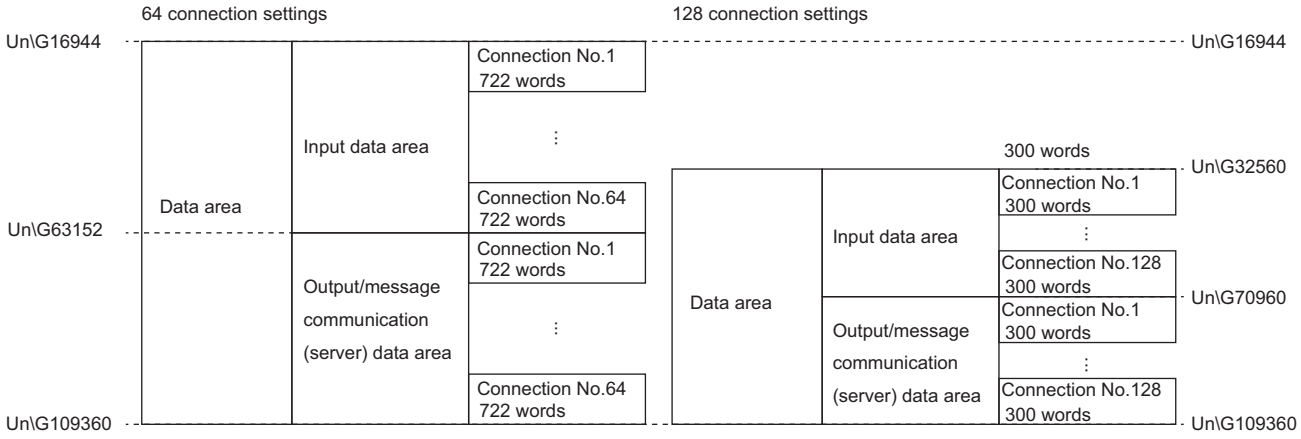
### ■Message communication response area

○: Set, —: Do not set

| Address | Item | Class3 | UCMM | Description |
|---|---|---|---|---|
| Un\G4816 | Result storage area | — | — | The request area processing result is stored.<br>• 0: Completed successfully<br>• Other than 0: Completed with an error (error code)<br>For details on error codes, refer to ☞ Page 192 List of Error Codes. |
| Un\G4817 onwards Un\G4818 | CIP response code | — | — | The request area processing result is stored with a CIP response code. |
| Un\G4819 | Data Type | — | — | The request area processing result is stored.<br>• When the communication method is instance communications: This area is not used.<br>• When the communication method is tag communication and the Service is Class3 Read Originator: The response data type from the sending EtherNet/IP device is stored.<br>• When the communication method is tag communication and the Service is Class3 Write Originator: The request area value is stored. |
| Un\G4820 | Class | — | — | Refer to the manuals of the response command transmission source EtherNet/IP device and the EtherNet/IP specifications. |
| Un\G4821 | Instance | — | — | Refer to the manuals of the response command transmission source EtherNet/IP device and the EtherNet/IP specifications. |
| Un\G4822 | Attribute | — | — | Refer to the manuals of the response command transmission source EtherNet/IP device and the EtherNet/IP specifications. |
| Un\G4823 onwards Un\G4824 | Execution completion count | — | — | The number of execution completions of the message communication is stored. |

# 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 (Un\G16944 to Un\G63151 or Un\G32560 to Un\G70959)

The input data for each connection is stored.
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 sent the response command is stored. However, it is not used for a service that sets values for the transmission destination device.<br>For details, refer to the manuals of the transmission destination EtherNet/IP device. |
| | When the communication method is tag communication | • When the Service is Class3/UCMM Read Originator, the response data from the transmission destination EtherNet/IP device is stored.<br>• 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 (Un\G63152 to Un\G109359 or Un\G70960 to Un\G109359)

Set the output data for each connection or the tag data for message communication (server).

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 sent 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.<br>• Get_Attribute_Single: No setting<br>• Set_Attribute_Single: Value set for the specified attribute<br>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 | • When the Service is Class3/UCMM Write Originator, specify the data to be written in the destination tag.<br>• 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.<br>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.

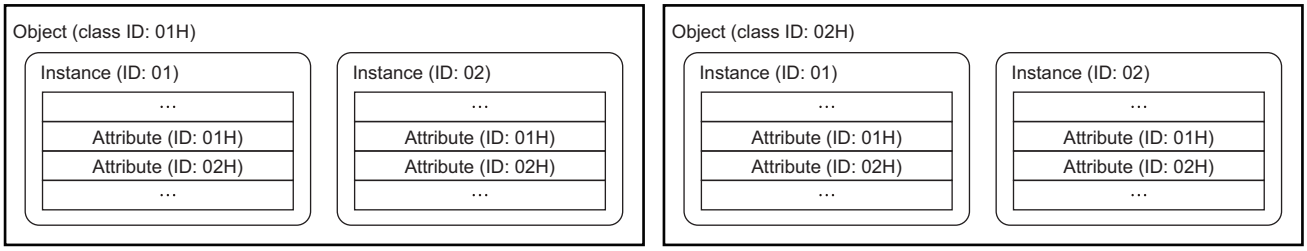
# Appendix 5 Details of Message Communication Support Command

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 inside an EtherNet/IP device.<br>An object has one or more instances. |
| Instance | Each instance is managed with its instance ID inside an object.<br>An instance has one or more pieces of information called attributes inside.<br>In addition, an instance has one or more services that can be executed and each service can be used with its service code.<br>Available services are determined by the instance. |
| Attribute | Each attribute is managed with its attribute ID inside an instance. |

The following shows the relationships between objects, instances, and attributes.



## Service execution

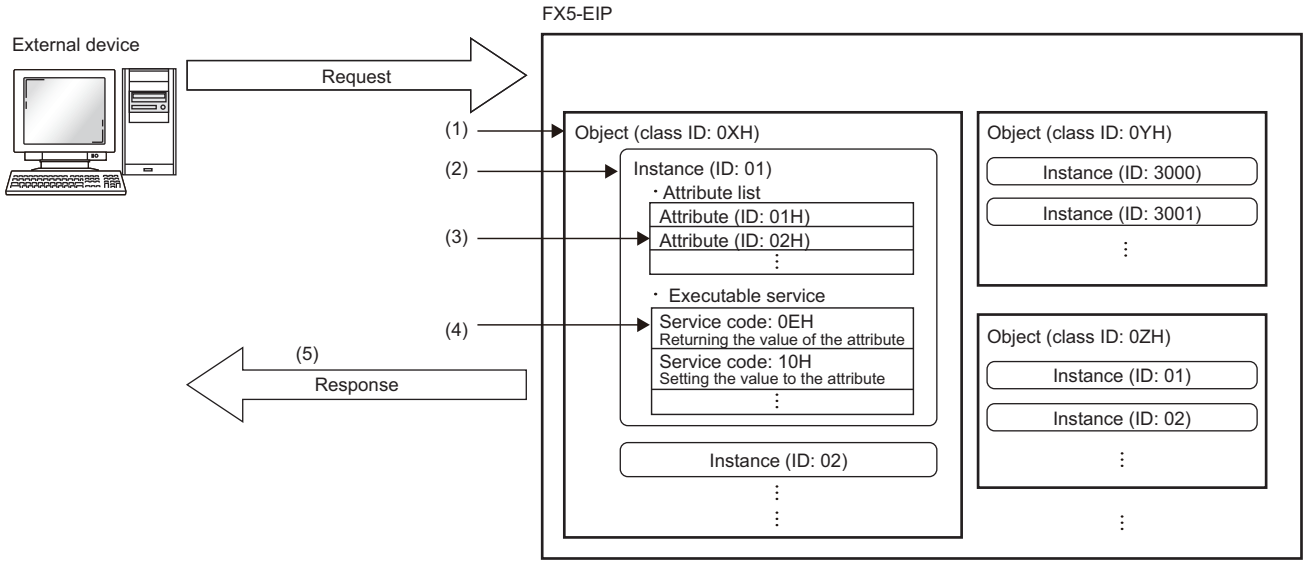
To execute a service, specify a target by using a class ID, instance ID, and attribute ID. (In some services, an attribute ID does not need to be specified.)

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 sent 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 | An object 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 |

A

## Command explanations

The object items are shown below.

| Item | Description |
|---|---|
| Class attribute | Data possessed by the class of an object.*1<br>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)<br>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 ± 1.17549435 - 38 to E ± 3.40282347 + 38 |
| LREAL | Double-precision floating point real number | 8 bytes | E ± 2.2250738585072014 - 308 to E ± 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<br>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.<br>• Attribute ID1: Value of attribute ID1<br>• Attribute ID2: Value of attribute ID2<br>• Attribute ID6: 0000H<br>• 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 | USINT | Major revision | 01H |
| | | | | Minor Revision | USINT | Minor revision | 01H |
| 5 | ○ | × | Status | | WORD | Product status | ☞ Page 258 |
| 6 | ○ | × | Serial Number | | UDINT | Serial number | Varies between 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.

### ■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.)<br>• 0: EtherNet/IP communications are not connected as the target device.<br>• 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.)<br>• 0010 (2H): Error occurring on one or more connections<br>• 0011 (3H): No connections established<br>• 0101 (5H): Major Fault occurring (bit 10 or bit 11 turned on)<br>• 0110 (6H): One or more connections performing normal communications in RUN mode<br>• 0111 (7H): One or more connections all performing communications in IDLE mode |
| 8 | Minor Recoverable Fault | • 0: No error<br>• 1: Minor error occurring |
| 9 | Minor Unrecoverable Fault | Fixed to 0 |
| 10 | Major Recoverable Fault | • 0: No error<br>• 1: Moderate error occurring |
| 11 | Major Unrecoverable Fault | • 0: No error<br>• 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.<br>• Stop of EtherNet/IP communications<br>• LED test (same as at module startup)<br>• Startup of EtherNet/IP communications<br>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 | 0008H |
| | | | | Classes | USINT array [8] | List of supported class codes (class IDs) | • 0: 0001H<br>• 1: 0002H<br>• 2: 0004H<br>• 3: 0006H<br>• 4: 00F5H<br>• 5: 00F6H<br>• 6: 0109H<br>• 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 | UINT | Path size of physical link object | 0002H |
| | | | | Path | Padded EPATH | Logical segment that identifies the physical link object | • 0: 20H<br>• 1: F6H<br>• 2: 24H<br>• 3: 01H |
| 5 | ○ | × | Interface Configuration | IP Address | UDINT | IP address of the device | Set values of parameters |
| | | | | Network Mask | UDINT | Network mask of the device | |
| | | | | Gateway Address | UDINT | Default gateway address | |
| | | | | Name Server | UDINT | Primary name server | 00000000H |
| | | | | Name Server 2 | UDINT | Secondary name server | 00000000H |
| | | | | Domain Name | STRING | Default domain name | " " (null character) |
| 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). | • 1 to 3600<br>0 is invalid.<br>(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 (to set the IP address acquired from the parameter settings) |
| 4 | Mcast Pending | Fixed to 0 (because the TTL Value and Mcast Config attribute settings are not supported) |
| 5 | Interface Configuration Pending | Fixed to 0 (because Interface Configuration attribute setting is not supported) |
| 6 | AcdStatus | Fixed to 0 (because the address duplication detection setting is not supported) |
| 7 | AcdFault | Fixed to 0 (because the address duplication detection setting is not supported) |
| 8 | IANA Port Admin Change Pending | Fixed to 0 (because the IANA Port Admin attribute setting is not supported) |
| 9 | IANA Protocol Admin Change Pending | Fixed to 0 (because the IANA Protocol Admin attribute setting is not supported) |
| 10 to 31 | Reserved | Fixed to 0 |

### ■Details of interface capability flag

| Bit | Description | Value |
|---|---|---|
| 0 | BOOTP Client | Fixed to 0 (because the BOOTP setting is not supported) |
| 1 | DNS Client | Fixed to 0 (because the name resolution setting with DNS is not supported) |
| 2 | DHCP Client | Fixed to 0 (because the IP address setting with DHCP is not supported) |
| 3 | DHCP-DNS Update | Fixed to 0 (because the host name sending setting with DHCP requests is not supported) |
| 4 | Configuration Settable | Fixed to 0 (because Interface Configuration attribute setting is not supported) |
| 5 | Hardware Configurable | Fixed to 1 (available for IP addresses set with parameters) |
| 6 | Interface Configuration Change Requires Reset | Fixed to 0 (because Interface Configuration attribute setting is not supported) |
| 7 | AcdCapable | Fixed to 0 (because the address duplication detection setting is not supported) |
| 8 to 31 | Reserved | Fixed to 0 |

### ■Details of interface control flag

| Bit | Description | Value |
|---|---|---|
| 0 to 3 | Configuration Method | Fixed to 0 (to use IP addresses set with parameters) |
| 4 | DNS Enable | Fixed to 0 (because the name resolution setting with DNS is not supported) |
| 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) | • 10<br>• 100<br>• 1000 |
| 2 | ○ | × | Interface Flags | | DWORD | Interface status flag | ☞ Page 265 |
| 3 | ○ | × | Physical Address | | USINT array [6] | MAC layer address | Varies between modules. |
| 4 | ○*2 | × | Interface Counters | In Octets | UDINT | Number of octets received through the interface | Value on the left |
| | | | | In Ucast Packets | UDINT | Number of unicast packets received through the interface | Value on the left |
| | | | | In NUcast Packets | UDINT | Number of non-unicast packets received through the interface | Value on the left |
| | | | | In Discards | UDINT | Number of receive packets received through the interface but discarded | 00000000H |
| | | | | In Errors | UDINT | Number of receive packets including errors (number of packets not included in InDiscards) | 00000000H |
| | | | | In Unknown Protos | UDINT | Number of receive packets including unknown protocols | Value on the left |
| | | | | Out Octets | UDINT | Number of octets transmitted through the interface | Value on the left |
| | | | | Out Ucast Packets | UDINT | Number of unicast packets transmitted through the interface | Value on the left |
| | | | | Out NUcast Packets | UDINT | Number of non-unicast packets transmitted through the interface | Value on the left |
| | | | | Out Discards | UDINT | Number of discarded transmission packets | 00000000H |
| | | | | Out Errors | UDINT | Number of transmission packets including errors | 00000000H |

| 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 sent successfully with only one collision | Value on the left |
| | | | | Multiple Collisions | | | UDINT | Number of frames sent 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 send 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 to force the interface to operate at | — |
| | | | | | | 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 | Value on the left |
| | | | | HCInUcastPkts | ULINT | Number of unicast packets received through the interface | Value on the left |
| | | | | HCInMulticastPkts | ULINT | Number of multicast packets received through the interface | 0000000000000000H |
| | | | | HCInBroadcastPkts | ULINT | Number of broadcast packets received through the interface | 0000000000000000H |
| | | | | HCOutOctets | ULINT | Number of octets sent through the interface | Value on the left |
| | | | | HCOutUcastPkts | ULINT | Number of packets sent through the interface | Value on the left |
| | | | | HCOutMulticastPkts | ULINT | Number of multicast packets sent through the interface | 0000000000000000H |
| | | | | HCOutBroadcastPkts | ULINT | Number of broadcast packets sent through the interface | 0000000000000000H |
| 13 | ○*2 | × | HC Media Counters | HCStatsAlignmentErrors | ULINT | 64-bit version of Alignment Errors | Value on the left |
| | | | | HCStatsFCSErrors | ULINT | 64-bit version of FCS Errors | 0000000000000000H |
| | | | | HCStatsInternalMacTransmitErrors | ULINT | 64-bit version of MAC Transmit Errors | 0000000000000000H |
| | | | | HCStatsFrameTooLongs | ULINT | 64-bit version of Frame Too Long | 0000000000000000H |
| | | | | HCStatsInternalMacReceiveErrors | ULINT | 64-bit version of MAC Receive Errors | 0000000000000000H |
| | | | | HCStatsSymbolErrors | ULINT | Number of illegal data symbols in the media when a valid carrier exists | 0000000000000000H |

*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 | • 0: Link-down<br>• 1: Link-up |
| 1 | Connection status (full-duplex/half-duplex) | • 0: Half-duplex<br>• 1: Full-duplex |
| 2 to 4 | Auto-negotiation status | • 0: Auto-negotiation being executed<br>• 1: Auto-negotiation failed and operation in progress with the default communication speed and method<br>• 2: Communication method detection failed, but communication speed detection succeeded<br>• 3: Auto-negotiation completed successfully<br>• 4: Auto-negotiation unexecuted |
| 5 | Necessity of restart after manual settings | Fixed to 0 (because manual settings are not supported) |
| 6 | Local Hardware Fault detection status | Fixed to 0 (because Local Hardware Faults are 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 sends and receives data according to the RPI interval defined by the parameter setting 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.

$$\text{Fastest value of RPI} = \frac{2 \times \text{Number of connections}}{\text{PPS}} \text{ (s)}$$

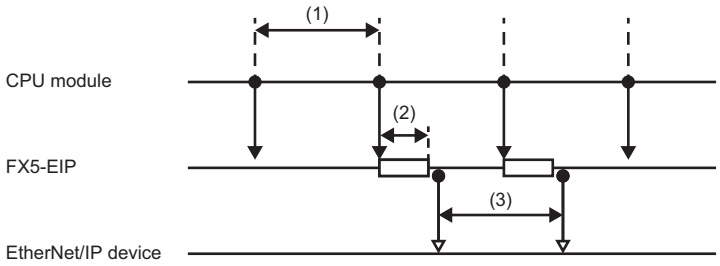
## Transmission delay time

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 controllers, and the system configuration.

### Cyclic communication

#### ■Send delay time

The concept of transmission delay time of send data is shown below.



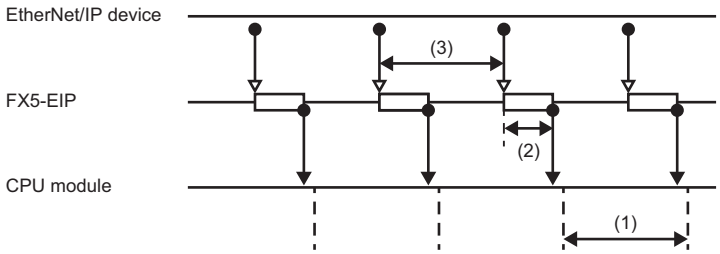

| No. | Item name | Description |
|---|---|---|
| (1) | Sequence scan | Time required from setting the send data in a program to refreshing the buffer memory on the FX5-EIP |
| (2) | Send delay time | Time required for transferring send data from the buffer memory on the FX5-EIP to the send buffer (approximately 1ms for 32 connections and 64-byte data size) |
| (3) | RPI | RPI setting value (transmission interval time) |

The transmission delay time of send data is calculated by the following formula.

| Item name | Transmission delay time |
|---|---|
| Normal value | RPI÷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 send data is calculated by the following formula.

| Item name | Transmission delay time |
|---|---|
| Maximum value | (1) + (2) + (3) |

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# 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 FFFEH | 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<br>• MELSOFT connection<br>• SLMP communication (server function)<br>• 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

This product includes code that was developed by RSA Data Security, Inc.
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# INDEX

# MEMO

# REVISIONS

| Revision date | Revision | Description |
|---|---|---|
| October 2025 | A | First edition |

Japanese manual number: SH-082708-A

# 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.
Visit our website to find our locations worldwide.

MITSUBISHI ELECTRIC Factory Automation Global Website
Locations Worldwide
www.MitsubishiElectric.com/fa/about-us/overseas/

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SH(NA)-082709ENG-A
MODEL: FX5-U-EIP-E

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