MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-F series

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

SAFETY PRECAUTIONS

(Read these precautions before use.)

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

The precautions given in this reference are concerned with this product only. For the safety precautions of the programmable controller system, refer to the User's Manual (Hardware) of the CPU module used.

This reference classifies the safety precautions into two categories: "⚠WARNING" and "⚠CAUTION".

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

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

It is important to follow all precautions for personal safety.

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

INTRODUCTION

Thank you for purchasing the Mitsubishi MELSEC iQ-F series programmable controllers.
This reference will guide the reader in module FBs for following target modules.
Before using this product, please read this manual and the relevant manuals introduced in this specifications carefully and pay attention to safety in order to handle the product correctly.
Always forward it to the end user.

Relevant products

- FX5S CPU module
- FX5UJ CPU module
- FX5U CPU module
- FX5UC CPU module
- FX5-ENET
- FX5-ENET/IP
- FX5-EIP
- FX5-CCLGN-MS
- FX5-CCLIEF
- MX Controller MX-F Model

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 into 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 to the local and national standards. If in doubt about the operation or use, please consult your local Mitsubishi Electric representative.
- Mitsubishi Electric will not accept responsibility for actual use of the product based on these illustrative examples. Please use it after confirming the function and safety of the equipment and system.
- The content, specification etc. of this manual may be changed, for improvement, without notice.
- The information in this manual has been carefully checked and is believed to be accurate; however, if you notice a doubtful point, an error, etc., please contact your local Mitsubishi Electric representative.

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RELEVANT MANUALS

Manual name <manual number>	Description
MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware) <SH-082452ENG>	Describes the details of hardware of the FX5 CPU module, including performance specifications, wiring, installation, and maintenance.
MELSEC iQ-F FX5 User's Manual (Application) <JY997D55401>	Describes basic knowledge required for program design, functions of the CPU module, devices/labels, and parameters.
MELSEC iQ-F FX5 Programming Manual (Program Design) <JY997D55701>	Describes the specifications of ladder, ST, FBD/LD, and SFC programs, and labels.
MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks) <JY997D55801>	Describes specifications of instructions and functions that can be used in programs.
MELSEC iQ-F FX5 User's Manual (Communication) <SH-082625ENG>	Describes the communication function of the CPU module built-in and the Ethernet module.
MELSEC iQ-F FX5 Ethernet Module User's Manual <SH-082026ENG>	Describes the functions of the Ethernet module.
MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual <SH-082027ENG>	Describes the functions of the FX5-ENET/IP Ethernet module.
MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual <SH-082709ENG>	Describes the functions of the EtherNet/IP module.
MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual <SH-082215ENG>	Describes CC-Link IE TSN module.
MELSEC MX Controller MX-F Model User's Manual <SH-082634ENG>	Procedures before operation, specifications, devices, memory, functions, parameters, and troubleshooting of the controller
MELSEC MX Controller MX-F Model Programming Manual <SH-082691ENG>	Program language specifications, controller instructions, standard functions/function blocks, and specifications of motion control function blocks
MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual <JY997D64201>	Describes CC-Link IE Field Network module.
GX Works3 Operating Manual <SH-081215ENG>	Describes the system configuration, parameter settings, and online operations of GX Works3.

TERMS

Unless otherwise specified, this manual uses the following terms.

Terms	Description
Device code	Device name represented in ASCII code or binary code for the device to be accessed
Device station	A station (local station, remote station) other than the master station
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance
Local station	A station that performs cyclic transmission and transient transmission with the master station and local stations
Master station	A station used to control the entire network. Only one master station can be used in a network. This station can perform cyclic transmission and transient transmission with all stations.
Module label	A label that represents one of memory areas (I/O signals and buffer memory areas) specific to each module in a given character string. For the module used, GX Works3 automatically generates this label, which can be used as a global label.
Socket communication	Data communications with the connected devices via Ethernet by TCP or UDP using dedicated instructions
Transient transmission	A function by which data are non-periodically exchanged among stations on the network. Data is exchanged with other stations when requested with a link dedicated command or from the engineering tool. Data can also be exchanged with other networks via the relay station or a gateway.

GENERIC TERMS AND ABBREVIATIONS

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

Generic term/abbreviation	Description
Controller	A generic term for the MELSEC MX Controller MX-F Model
FB	FB is the abbreviation for function block, in which the circuit blocks used repeatedly in a sequence program are broken down into parts so that the parts can be used for other purposes in the sequence program. This improves the program development efficiency, reduces program errors and improves the program quality.
FX5 CPU module	A generic term for the FX5S CPU module, FX5UJ CPU module, FX5U CPU module, and FX5UC CPU module
FX5S CPU module	A generic term for the FX5S-30MR/ES, FX5S-30MT/ES, FX5S-30MT/ESS, FX5S-40MR/ES, FX5S-40MT/ES, FX5S-40MT/ESS, FX5S-60MR/ES, FX5S-60MT/ES, FX5S-60MT/ESS, FX5S-80MR/ES*1, FX5S-80MT/ES*1, FX5S-80MT/ESS*1, FX5S-30MR/DS, FX5S-30MT/DS, FX5S-30MT/DSS, FX5S-40MR/DS, FX5S-40MT/DS, FX5S-40MT/DSS, FX5S-60MR/DS, FX5S-60MT/DS, FX5S-60MT/DSS, FX5S-80MR/DS*1, FX5S-80MT/DS*1, and FX5S-80MT/DSS*1
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-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, FX5UJ-60MT/ESS, FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, and FX5UJ-60MT/DSS
MQTT	An abbreviation for Message Queueing Telemetry Transport

*1 Area-specific model

1 OVERVIEW

The FBs listed in this reference are module FBs (for GX Works3) for Ethernet, CC-Link IE TSN, CC-Link IE Field Network, and EtherNet/IP.

1.1 Function Block (FB) List

Shown below is the list of the module FBs cited in this reference.

Point

Note that this reference does not describe the FB version information which is displayed such as "_00A" at the end of FB name.

The following shows the model names used in the module FBs by module.

• FX5S, FX5U, FX5UC, and FX5UJ

FX5UCPU

• FX5-ENET

FX5ENET

• FX5-ENET/IP

FX5ENETIP

• FX5-EIP

FX5EIP

FBs for Ethernet

○: Required, —: Not required

Name	Description	Necessity of parameter setting
M+model_ConnectionOpen (Connection establishment)	Opens (establishes) a connection.	○
M+model_ConnectionClose (Disconnection)	Closes (disconnects) the connection.	○
M+model_Recv_Socket (Receiving of data)	Reads the data received from the target device through socket communication.	○
M+model_Send_Socket (Sending of data)	Sends data to the target device through socket communication.	○
M+FX5UCPU-EN_SLMP_DeviceRead_IP (Reading of SLMP-compatible device)	Reads device data from the SLMP-compatible device by specifying IP address.	—
M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device)	Writes device data to the SLMP-compatible device by specifying IP address.	—
M+FX5UCPU-EN_SLMP_DeviceRead_Active (Reading of SLMP-compatible device with Active connection)	Performs the open/close processing and reading device data of SLMP-compatible devices via Active connection.	○
M+FX5UCPU-EN_SLMP_DeviceWrite_Active (Writing to SLMP target device with Active connection)	Performs the open/close processing and writing to the device data of SLMP-compatible devices via Active connection.	○
M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB)	Calculates the value to be input to the device code for SLMP communication FB.	—
M+FX5UCPU-EN_ModbusTcp_ClientRead (Reading by MODBUS/TCP client)	Performs the open/close processing and reading by MODBUS/TCP client in socket communication	○
M+FX5UCPU-EN_ModbusTcp_ClientWrite (Writing by MODBUS/TCP client)	Performs the open/close processing and writing by MODBUS/TCP client in socket communication	○
• M+model_MQTT_Connect (MQTT connection establishment) • M+ENET_MQTT_Connect_MF (MQTT connection establishment)*1	Controls the connection with an MQTT broker (server) to establish a TCP or TLS session on the CONNECT instruction or to disconnect the session on the DISCONNECT instruction.	○
• M+model_MQTT_PublishSend (Sending of MQTT data) • M+ENET_MQTT_PublishSend_MF (Sending of MQTT data)*1	Sends a message to an MQTT broker (server).	○
• M+model_MQTT_Receive (Receiving of MQTT data) • M+ENET_MQTT_Receive_MF (Receiving of MQTT data)*1	Reads a message received from an MQTT broker (server).	○

Name	Description	Necessity of parameter setting
• M+model_MQTT_Subscribe (Sending of Subscribe command) • M+ENET_MQTT_Subscribe_MF (Sending of Subscribe command)*1	Sends a SUBSCRIBE/UNSUBSCRIBE command to an MQTT broker (server).	○
• M+model_Mail_Send (Sending of E-mail) • M+ENET_Mail_Send_MF (Sending of E-mail)*1	Establishes a TLS/TCP session with an SMTP server. Then, it sends E-mail data.	○

*1 Module FBs for controller

FBs for CC-Link IE TSN

○: Required, —: Not required

Name	Description	Necessity of parameter setting
M+FX5CCLGNMS_DeviceRead (Reading of another station device)	Reads data from a specified device in the programmable controller of another station.	○
M+FX5CCLGNMS_DeviceWrite (Writing to another station device)	Writes data to a specified device in the programmable controller of another station.	○
M+FX5CCLGNMS_Send (Sending of another station data)	Sends data to the programmable controller of another station.	○
M+FX5CCLGNMS_Recv (Receiving of another station data)	Reads the data received from the programmable controller of another station.	○
M+FX5CCLGNMS_SetAddress (Station number/IP address setting)	Sets the station number/IP address for the own station.	○
M+FX5CCLGNMS_SLMP_DeviceRead_IP (Reading of SLMP-compatible device)	Reads device data from the SLMP-compatible device by specifying IP address.	—
M+FX5CCLGNMS_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device)	Writes device data to the SLMP-compatible device by specifying IP address.	—

FBs for CC-Link IE Field Network

○: Required, —: Not required

Name	Description	Necessity of parameter setting
M+FX5CCLIEF_DeviceRead (Reading of another station device)	Reads data from a specified device in the programmable controller of another station.	○
M+FX5CCLIEF_DeviceWrite (Writing to another station device)	Writes data to a specified device in the programmable controller of another station.	○
M+FX5CCLIEF_Send (Sending of another station device)	Sends data to the programmable controller of another station.	○
M+FX5CCLIEF_Recv (Receiving of another station device)	Reads the data received from the programmable controller of another station.	○
M+FX5CCLIEF_SetParameter (Parameter setting)	Sets parameters for a module.	○
M+FX5CCLIEF_StationNoSet (Own station number setting)	Sets the station number for the own station.	○

FBs for EtherNet/IP

○: Required, —: Not required

Name	Description	Necessity of parameter setting
M+FX5-EIP_Class1GetInputData (Class1 communications input data acquisition)	Acquires input data of the specified connection through the Class1 communications.	○
M+FX5-EIP_Class1SetOutputData (Class1 communications output data setting)	Updates output data of the specified connection through the Class1 communications.	○
M+FX5-EIP_UCMMOriginator_ReadTagData (UCMM tag communications data acquisition)	Acquires data from the tag of the specified target device through the UCMM tag communications.	○
M+FX5-EIP_UCMMOriginator_WriteTagData (UCMM tag communications data setting)	Sets data for the tag of the specified target device through the UCMM tag communications.	○
M+FX5-EIP_Class3Originator_ReadTagData (Class3 tag communications data acquisition)	Acquires data from the tag of the specified target device through the Class3 tag communications.	○
M+FX5-EIP_ Class3Originator_WriteTagData (Class3 tag communications data setting)	Sets data for the tag of the specified target device through the Class3 tag communications.	○
M+FX5-EIP_ UCMMOriginator_MessageSend (Sending of UCMM communications message)	Sends a message to the specified target device through the UCMM message communications.	○
M+FX5-EIP_ Class3Originator_MessageSend (Sending of Class3 communications message)	Sends a message to the specified target device through the Class3 message communications.	○
M+FX5ENETIP_Class1GetInputData (Class1 communications input data acquisition)	Acquires input data of the specified connection through the Class1 communications.	○
M+FX5ENETIP_Class1SetOutputData (Class1 communications output data setting)	Updates output data of the specified connection through the Class1 communications.	○

1.2 How to Obtain

The FBs for Ethernet, FBs for CC-Link IE TSN, FBs for CC-Link IE Field Network, and FBs for EtherNet/IP described in this reference manual are incorporated into GX Works3[*1].

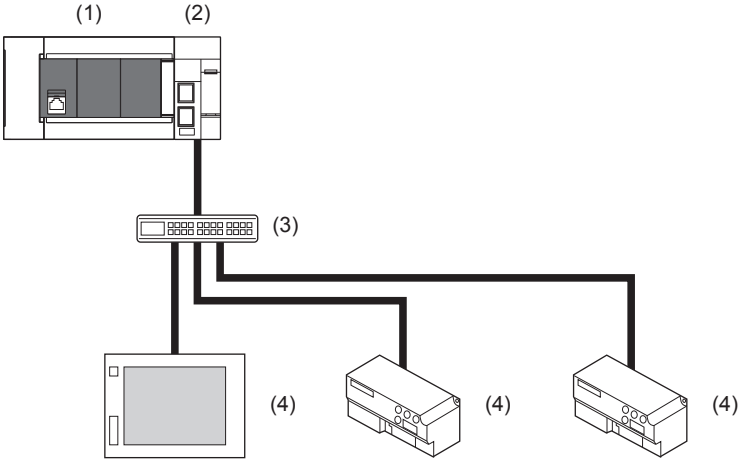
For using the module FBs, refer to the 📖GX Works3 Operating Manual.

*1 Use appropriate GX Works3 compatible with the module FB used.

1.3 System Configuration

This shows the system configurations to use the module FBs for this reference.

Ethernet

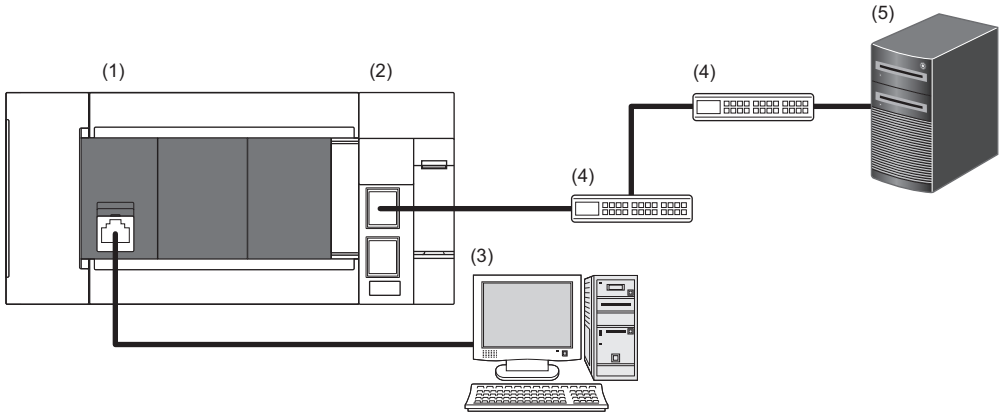


(1) FX5S/FX5UJ/FX5U/FX5UC CPU module
(2) FX5-ENET (master station)
(3) Hub
(4) External device (slave station)

For specifications of the module used, refer to the user's manual of each module.

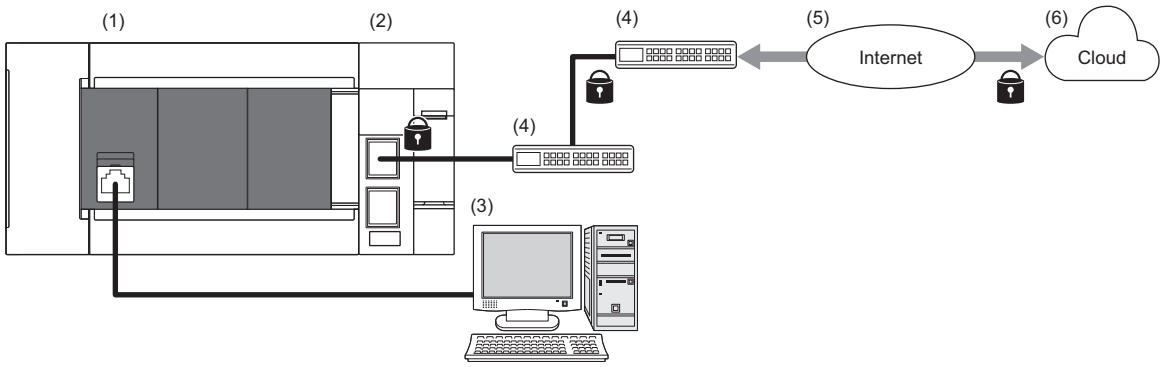
Ethernet (MQTT communication function)

■For TCP connection



(1) FX5UJ/FX5U/FX5UC CPU module
(2) FX5-ENET (MQTT client)
(3) Personal computer installed with GX Works3 or Certificate Configuration Tool for FX5-ENET
(4) Ethernet switch/router (Optional)
(5) MQTT broker (Server)

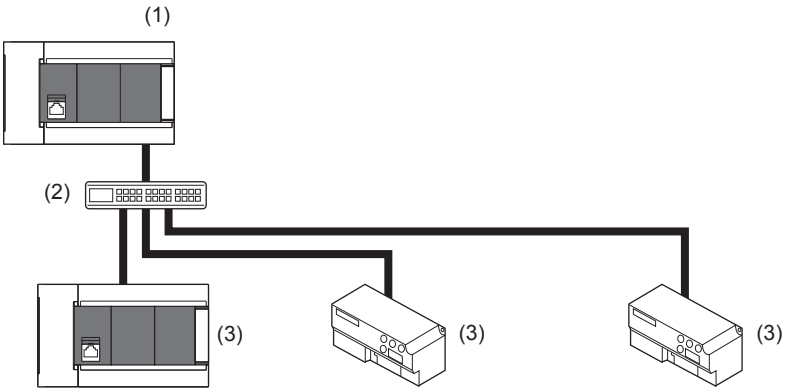
■For TLS connection



(1) FX5UJ/FX5U/FX5UC CPU module
(2) FX5-ENET (MQTT client)
(3) Personal computer installed with GX Works3 or Certificate Configuration Tool for FX5-ENET
(4) Ethernet switch/router (Optional)
(5) MQTT broker (Server)

For specifications of the module used, refer to the user's manual of each module.

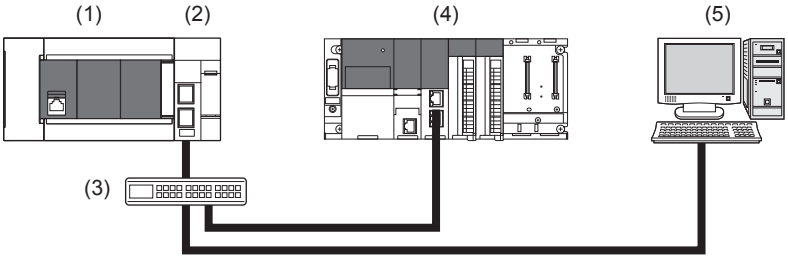
MODBUS/TCP



(1) FX5S/FX5UJ/FX5U/FX5UC CPU module (master station)
(2) Hub
(3) MODBUS/TCP device (slave station)

For specifications of the module used, refer to the user's manual of each module.

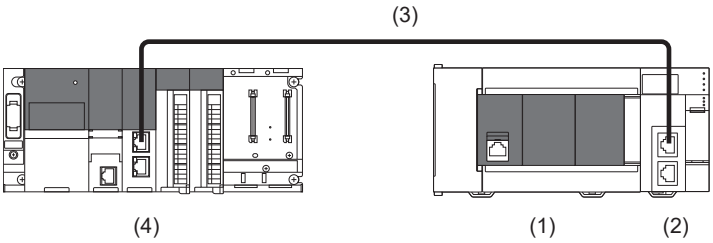
CC-Link IE TSN



(1) FX5UJ/FX5U/FX5UC CPU module
(2) FX5-CCLGN-MS (master station)
(3) Hub
(4) CC-Link IE TSN module (device station)
(5) Personal computer

For specifications of the module used, refer to the user's manual of each module.

CC-Link IE Field Network

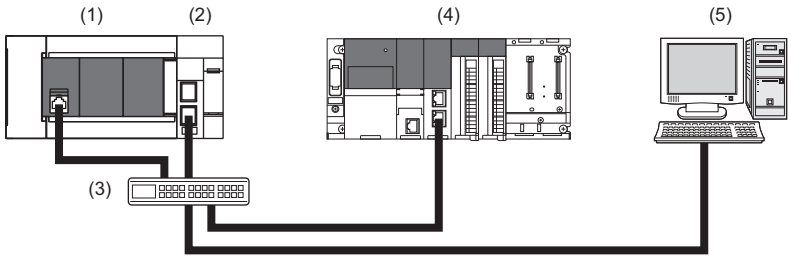


(1) FX5UJ/FX5U/FX5UC CPU module
(2) FX5-CCLIEF (device station)
(3) Ethernet cable
(4) CC-Link IE Field Network module (master station)

For specifications of the module used, refer to the user's manual of each module.

EtherNet/IP

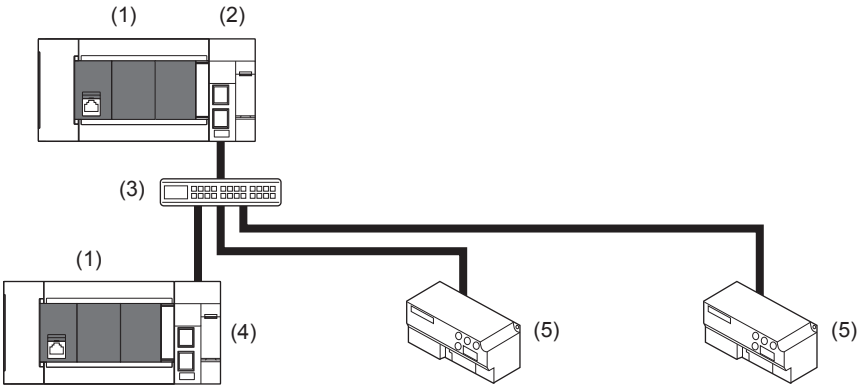
■For the FX5-EIP



(1) FX5UJ/FX5U/FX5UC CPU module
(2) FX5-EIP
(3) Hub
(4) EtherNet/IP device
(5) Personal computer

For specifications of the module used, refer to the user's manual of each module.

■For the FX5-ENET/IP



(1) FX5UJ/FX5U/FX5UC CPU module
(2) FX5-ENET/IP (scanner)
(3) Hub
(4) FX5-ENET/IP (adapter)
(5) EtherNet/IP device (scanner/adapter)

For specifications of the module used, refer to the user's manual of each module.

2 FB FOR Ethernet

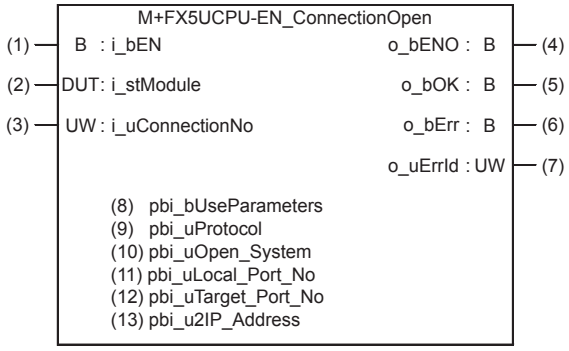
2.1 M+model_ConnectionOpen (Connection establishment)

The following table lists the FB module names by module used.

No.	Name	Target module
1	M+FX5UCPU-EN_ConnectionOpen	FX5 CPU module
2	M+FX5ENET_ConnectionOpen	FX5-ENET
3	M+FX5ENETIP_ConnectionOpen	FX5-ENET/IP
4	M+FX5-EIP_ConnectionOpen	FX5-EIP

Overview

This FB opens (establishes) a connection for data communication with target device.



The above FB is an example for the FX5 CPU module.

Labels

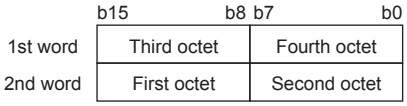
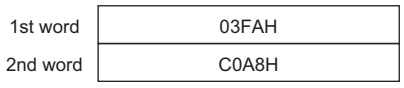
Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5UCPU, FX5ENET_1, FX5ENETIP_1, FX5EIP_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	The setting range differs depending on the target module.	Specify the number of the connection to be opened. ■FX5 CPU module 1 to 8 ■FX5-ENET, FX5-ENET/IP, FX5-EIP 1 to 32

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.

Public label

No.	Variable name	Name	Data type	Range	Description
(8)	pbi_bUseParameters	Parameter used	Bit	On, off	Specify whether to use the parameter values set by the engineering tool or the following operation parameter ((11) to (13)) values when processing for opening a connection. • Off: Performs open processing according to the target device configuration setting made by the engineering tool. (The following operation parameters ((11) to (13)) need not be set. Any settings are ignored if made.) • On: Performs open processing according to the following operation parameters ((11) to (13)).
(9)	pbi_uProtocol	Protocol	Word [Unsigned]/Bit String [16-bit]	0, 1*1	Select the protocol to be used for the connection to be opened. • 0: TCP/IP • 1: UDP/IP
(10)	pbi_uOpen_System	Open method	Word [Unsigned]/Bit String [16-bit]	0 to 2*1	Select the connection open method. • 0: Active open or UDP/IP • 1: Unpassive open • 2: Fullpassive open
(11)	pbi_uLocal_Port_No	Own node port number	Word [Unsigned]/Bit String [16-bit]	1 to 5548, 5570 to 65534	Specify the port number of the own node. Own node port numbers 1 to 1023 are generally reserved port numbers, and 61440 to 65534 are used by other communication functions. Therefore, port numbers 1024 to 5548 and 5570 to 61439 should be used.
(12)	pbi_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	The setting range differs depending on the target module.	Specify the destination port number. ■FX5 CPU module 1 to 65534 ■FX5-ENET, FX5-ENET/IP, FX5-EIP 1 to 65535*2
(13)	pbi_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	The setting range differs depending on the target module.	Specify the IP address of target device.  Example: When IP address is 192.168.3.250  ■FX5 CPU module 0.0.0.1 to 223.255.255.254*3 ■FX5-ENET, FX5-ENET/IP, FX5-EIP 0.0.0.1 to 223.255.255.255

*1 If a value out of the effective range is set, the same settings as those for 0 are used.

*2 The connection specifying 65535 receives data from all port numbers (only when UDP/IP is selected in the protocol). To send the data, specify the number from 1 to 65534. The connection specifying 65535 cannot send the data.

*3 If a value out of the effective range is set, 192.168.1.1 is used as the IP address of target device.

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	—	GX Works3 Version 1.050C or later
FX5-ENET/IP	—	GX Works3 Version 1.050C or later
FX5-EIP	—	GX Works3 Version 1.120A or later

■CPU module

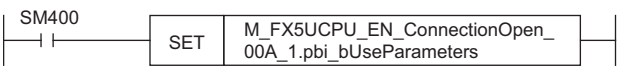
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	■FX5 CPU module 161 steps ■FX5-ENET, FX5-ENET/IP, FX5-EIP 156 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.02K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

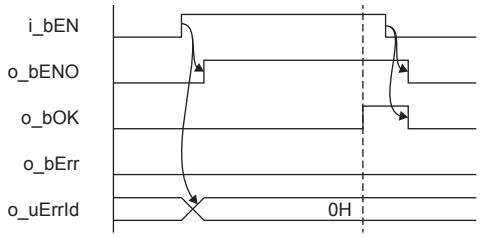
Processing

- Turning on i_bEN (execution command) opens a connection for data communication with the target device.
- If an error occurs, o_bErr (error completion) is turned on, and the error code is stored in o_uErrId (error code). For the error code, refer to ☞ Page 23 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 22 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to turn on the parameters used (M_FX5UCPU_EN_ConnectionOpen_00A_1.pbi_bUseParameters).

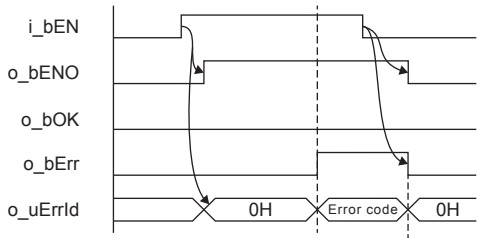


Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

■FX5 CPU module
SP.SOCOPEN instruction
■FX5-ENET, FX5-ENET/IP, FX5-EIP
GP.OPEN instruction

- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the above instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- If this FB is executed for the connection for which parameters are already set by "External Device Configuration", make settings so that the parameters specified by this FB are overwritten.
- This FB requires circuit settings for all the input labels.

Parameter setting

Set the target device connection configuration on Ethernet by using GX Works3.

- When the built-in Ethernet port of the CPU module is used

Navigation window ⇨ [Parameter] ⇨ Module name ⇨ [Module Parameter] ⇨ [Ethernet Port] ⇨ [Basic Settings] ⇨ [External Device Configuration]

- When the Ethernet module is used

Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-ENET] or [FX5-ENET/IP] ⇨ [Basic Settings] ⇨ [External Device Configuration]

In the target device connection configuration setting, set the TCP connection or UDP connection. For details on the setting procedure, refer to the user's manual for the CPU module or Ethernet module used.

Performance value

SP.SOCOPEN instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	When using UDP connection	1.41ms	0.885ms	2 scans
	When using Active connection	4.94ms	0.837ms	8 scans
FX5UJ	When using UDP connection	1.39ms	0.730ms	6 scans
	When using Active connection	4.25ms	0.748ms	11 scans
FX5U, FX5UC*1*2	When using UDP connection	0.99ms	0.413ms	4 scans
	When using Active connection	4.16ms	0.387ms	10 scans

GP.OPEN instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	When using UDP connection	3.11ms	0.689ms	7 scans
	When using Active connection	6.87ms	0.691ms	20 scans
FX5U, FX5UC*1*2	When using UDP connection	3.05ms	0.582ms	9 scans
	When using Active connection	5.70ms	0.522ms	17 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.

*2 The labels in the standard area are used.

Error code

Error code (hexadecimal)	Description	Action
All error code	■FX5 CPU module Same as the error code caused by the connection establishment (SP.SOCOPEN) instruction. ■FX5-ENET, FX5-ENET/IP, FX5-EIP Same as the error code caused by the connection establishment (GP.OPEN) instruction.	■FX5 CPU module Refer to the MELSEC iQ-F FX5 User's Manual (Communication). ■FX5-ENET Refer to the MELSEC iQ-F FX5 Ethernet Module User's Manual. ■FX5-ENET/IP Refer to the MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual. ■FX5-EIP Refer to the MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

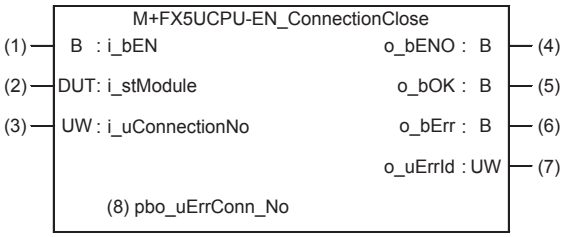
2.2 M+model_ConnectionClose (Disconnection)

The following table lists the FB module names by module used.

No.	Name	Target module
1	M+FX5UCPU-EN_ConnectionClose	FX5 CPU module
2	M+FX5ENET_ConnectionClose	FX5-ENET
3	M+FX5ENETIP_ConnectionClose	FX5-ENET/IP
4	M+FX5-EIP_ConnectionClose	FX5-EIP

Overview

This FB closes (disconnects) a connection for data communication with target device.



The above FB is an example for the FX5 CPU module.

Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5UCPU, FX5ENET_1, FX5ENETIP_1, FX5EIP_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	The setting range differs depending on the target module.	Specify the number of the connection to be closed. This function closes all connections if FFFFH is specified. ■FX5 CPU module 1 to 8 ■FX5-ENET, FX5-ENET/IP, FX5-EIP 1 to 32

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	Stores the error code that occurred in the FB.

Public label

No.	Variable name	Name	Data type	Range	Description
(8)	pbo_uErrConn_No	Error connection No.	Word [Unsigned]/ Bit String [16-bit]	—	The number of the connection for which close processing was completed with an error is stored. If FFFFH is specified in i_uConnectionNo (Connection No.), the number of the connection for which close processing was first completed with an error is stored.

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	—	GX Works3 Version 1.050C or later
FX5-ENET/IP	—	GX Works3 Version 1.050C or later
FX5-EIP	—	GX Works3 Version 1.120A or later

■CPU module

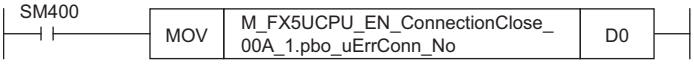
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	■FX5 CPU module 136 steps ■FX5-ENET, FX5-ENET/IP, FX5-EIP 143 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.01K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

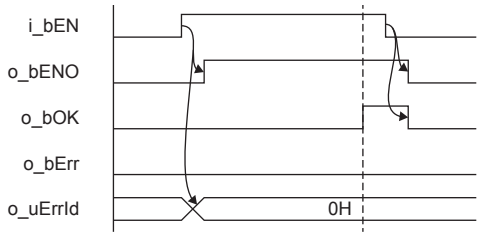
Processing

- When i_bEN (execution command) is turned on, this function closes a connection for data communication with target device.
- The function closes all connections if FFFFH is specified for the connection number in the input argument.
- If the function fails to close even one connection among those specified to be closed, it is completed with an error.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 22 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to output an error connection number (M_FX5UCPU_EN_ConnectionClose_00A_1.pbo_uErrConn_No) to the device D0.

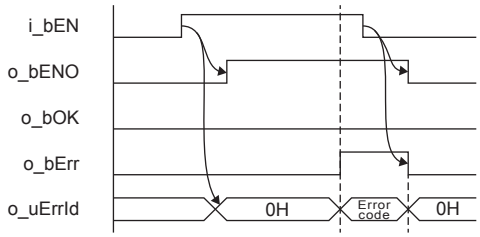


Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

■FX5 CPU module

SP.SOCCLOSE instruction

■FX5-ENET, FX5-ENET/IP, FX5-EIP

GP.CLOSE instruction

- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the above instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.

Parameter setting

For the parameter setting, refer to ☞ Page 22 Parameter setting.

Performance value

SP.SOCCLOSE instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	When using UDP connection	1.99ms	0.722ms	4 scans
	When using Active connection	4.74ms	0.714ms	10 scans
FX5UJ	When using UDP connection	1.99ms	0.722ms	4 scans
	When using Active connection	4.74ms	0.714ms	10 scans
FX5U, FX5UC*1*2	When using UDP connection	1.99ms	0.722ms	4 scans
	When using Active connection	4.74ms	0.714ms	10 scans

GP.CLOSE instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	When using UDP connection	1.85ms	0.732ms	10 scans
	When using Active connection	6.08ms	0.754ms	15 scans
FX5U, FX5UC*1*2	When using UDP connection	2.77ms	0.584ms	8 scans
	When using Active connection	6.38ms	0.586ms	18 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.

*2 The labels in the standard area are used.

Error code

Error code (hexadecimal)	Description	Action
All error code	■FX5 CPU module Same as the error code caused by the disconnection (SP.SOCCLOSE) instruction. ■FX5-ENET, FX5-ENET/IP, FX5-EIP Same as the error code caused by the disconnection (GP.CLOSE) instruction.	■FX5 CPU module Refer to the MELSEC iQ-F FX5 User's Manual (Communication). ■FX5-ENET Refer to the MELSEC iQ-F FX5 Ethernet Module User's Manual. ■FX5-ENET/IP Refer to the MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual. ■FX5-EIP Refer to the MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

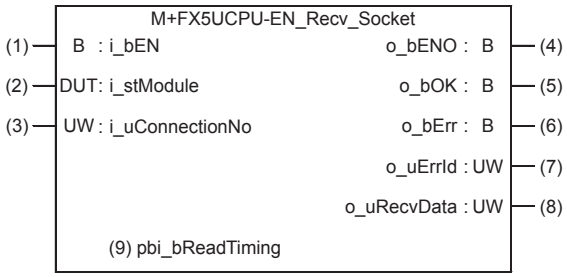
2.3 M+model_Recv_Socket (Receiving of data)

The following table lists the FB module names by module used.

No.	Name	Target module
1	M+FX5UCPU-EN_Recv_Socket	FX5 CPU module
2	M+FX5ENET_Recv_Socket	FX5-ENET
3	M+FX5ENETIP_Recv_Socket	FX5-ENET/IP
4	M+FX5-EIP_Recv_Sockt	FX5-EIP

Overview

This FB reads the data received by socket communication.



The above FB is an example for the FX5 CPU module.

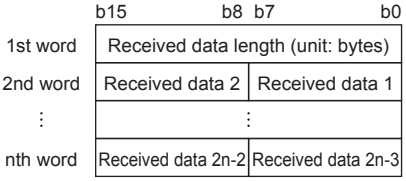
Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5UCPU, FX5ENET_1, FX5ENETIP_1, FX5EIP_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	The setting range differs depending on the target module.	Specify the connection number for receiving data. ■FX5 CPU module 1 to 8 ■FX5-ENET, FX5-ENET/IP, FX5-EIP 1 to 32

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that reading of the received data has completed normally.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.

No.	Variable name	Name	Data type	Default value	Description
(8)	o_uRecvData	Receive data storage destination	Word [Unsigned]/Bit String [16-bit]	—	Specify the receive data length and the start number of the device for storing received data.  • The received data length is 1 to 2046 bytes. • Receive data is stored in the word area in order from the first half (b0 to b7) to the second half (b8 to b15).

Public label

No.	Variable name	Name	Data type	Range	Description
(9)	pbi_bReadTiming	Read timing	Bit	On, off	Specify the timing of executing data read processing. • Off: Start reading soon after the module FB starts. • On: Start reading in the first END processing after the module FB starts. The setting is ignored in the FX5 CPU module because it reads the data in the END processing.

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	—	GX Works3 Version 1.050C or later
FX5-ENET/IP	—	GX Works3 Version 1.050C or later
FX5-EIP	—	GX Works3 Version 1.120A or later

■CPU module

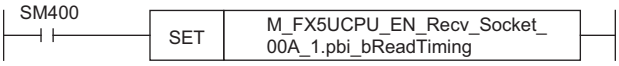
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	■FX5 CPU module 61 steps ■FX5-ENET, FX5-ENET/IP, FX5-EIP 68 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.01K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

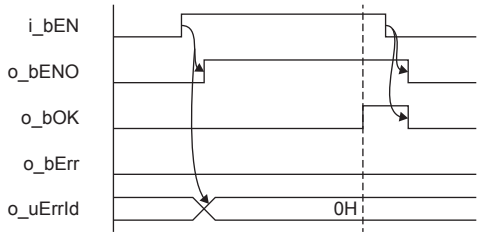
Processing

- When i_bEN (execution command) is turned on, this function reads the data received to the connection specified by the input argument.
- If an error occurs during data receive, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 31 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 22 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to turn on the read timing (M_FX5UCPU_EN_Recv_Socket_00A_1.pbi_bReadTiming).

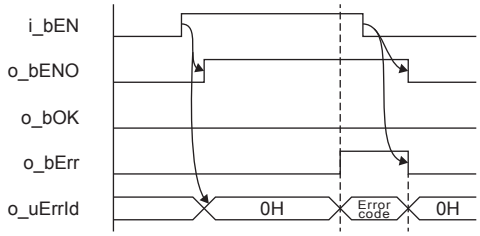


Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

■FX5 CPU module

SP.SOCRCV instruction

■FX5-ENET, FX5-ENET/IP, FX5-EIP

GP.SOCRCV instruction

- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the above instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.

Parameter setting

For the parameter setting, refer to ☞ Page 22 Parameter setting.

Performance value

SP.SOCRCV instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	Receive data length: 1 byte	0.431ms	0.872ms	1 scan
	Receive data length: 1023 bytes	0.527ms	0.856ms	1 scan
	Receive data length: 2046 bytes	0.808ms	0.904ms	1 scan
FX5UJ	Receive data length: 1 byte	0.399ms	0.731ms	1 scan
	Receive data length: 1023 bytes	0.471ms	0.708ms	1 scan
	Receive data length: 2046 bytes	0.587ms	0.700ms	1 scan
FX5U, FX5UC*1*2	Receive data length: 1 byte	0.246ms	0.396ms	1 scan
	Receive data length: 1023 bytes	0.290ms	0.394ms	1 scan
	Receive data length: 2046 bytes	0.351ms	0.394ms	1 scan

GP.SOCRCV instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Receive data length: 1 byte	1.290ms	0.840ms	2 scans
	Receive data length: 1023 bytes	1.900ms	1.020ms	3 scans
	Receive data length: 2046 bytes	3.090ms	1.520ms	5 scans
FX5U, FX5UC*1*2	Receive data length: 1 byte	0.942ms	0.591ms	2 scans
	Receive data length: 1023 bytes	1.970ms	0.944ms	4 scans
	Receive data length: 2046 bytes	2.820ms	1.570ms	5 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.

*2 The labels in the standard area are used.

Error code

Error code (hexadecimal)	Description	Action
All error code	■FX5 CPU module Same as the error code caused by the data receiving (SP.SOCRCV) instruction. ■FX5-ENET, FX5-ENET/IP, FX5-EIP Same as the error code caused by the data receiving (GP.SOCRCV) instruction.	■FX5 CPU module Refer to the 📖MELSEC iQ-F FX5 User's Manual (Communication). ■FX5-ENET Refer to the 📖MELSEC iQ-F FX5 Ethernet Module User's Manual. ■FX5-ENET/IP Refer to the 📖MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual. ■FX5-EIP Refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

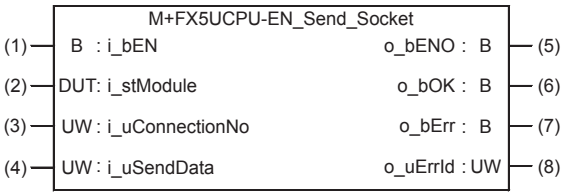
2.4 M+model_Send_Socket (Sending of data)

The following table lists the FB module names by module used.

No.	Name	Target module
1	M+FX5UCPU-EN_Send_Socket	FX5 CPU module
2	M+FX5ENET_Send_Socket	FX5-ENET
3	M+FX5ENETIP_Send_Socket	FX5-ENET/IP
4	M+FX5-EIP_Send_Socket	FX5-EIP

Overview

This FB sends the data to the target device of the specified connection.



The above FB is an example for the FX5 CPU module.

Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5UCPU, FX5ENET_1, FX5ENETIP_1, FX5EIP_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	The setting range differs depending on the target module.	Specify the connection number for sending data. ■FX5 CPU module 1 to 8 ■FX5-ENET, FX5-ENET/IP, FX5-EIP 1 to 32
(4)	i_uSendData	Send data storage destination	Word [Unsigned]/Bit String [16-bit]	—	Specify the send data length and the start number of the device containing the send data. b15 b8 b7 b0 1st word: Send data length (unit: bytes) 2nd word: Send data 2 | Send data 1 ⋮ nth word: Send data 2n-2 | Send data 2n-3 • The sent data length is 1 to 2046 bytes. • Data is sent in the word area in order from the first half (b0 to b7) to the second half (b8 to b15).

Output label

No.	Variable name	Name	Data type	Default value	Description
(5)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(6)	o_bOK	Normal completion	Bit	Off	Data has been sent normally when this output is on.
(7)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(8)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	—	GX Works3 Version 1.050C or later
FX5-ENET/IP	—	GX Works3 Version 1.050C or later
FX5-EIP	—	GX Works3 Version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

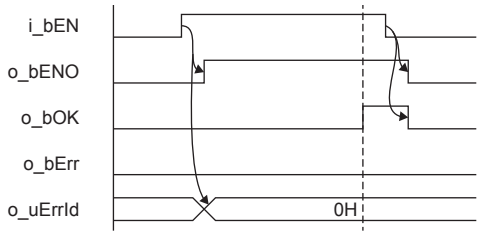
Item	Description
Language	Ladder diagram
Number of steps	■FX5 CPU module 62 steps ■FX5-ENET, FX5-ENET/IP, FX5-EIP 69 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.01K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

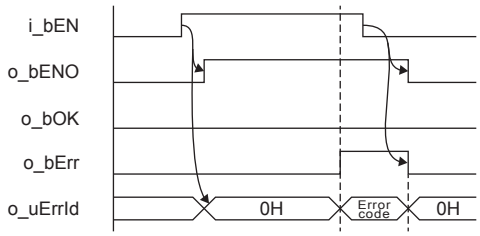
- When i_bEN (Execution command) is turned on, this function sends the data to the target device of the connection specified by the input argument.
- If an error occurs during data send, o_bErr (Error completion) is turned on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 35 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 22 Parameter setting.

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

■FX5 CPU module
SP.SOCSND instruction
■FX5-ENET, FX5-ENET/IP, FX5-EIP
GP.SOCSND instruction

- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the above instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.

Parameter setting

For the parameter setting, refer to ☞ Page 22 Parameter setting.

Performance value

SP.SOCSND instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	Send data length: 1 byte	3.02ms	0.842ms	3 scans
	Send data length: 1023 bytes	4.87ms	0.887ms	7 scans
	Send data length: 2046 bytes	8.36ms	0.901ms	16 scans
FX5UJ	Send data length: 1 byte	3.00ms	0.671ms	8 scans
	Send data length: 1023 bytes	3.94ms	0.739ms	8 scans
	Send data length: 2046 bytes	6.680ms	0.738ms	18 scans
FX5U, FX5UC*1*2	Send data length: 1 byte	2.74ms	0.395ms	10 scans
	Send data length: 1023 bytes	3.79ms	0.393ms	10 scans
	Send data length: 2046 bytes	4.52ms	0.402ms	16 scans

GP.SOCSND instruction

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Send data length: 1 byte	1.47ms	0.788ms	2 scans
	Send data length: 1023 bytes	2.14ms	1.270ms	4 scans
	Send data length: 2046 bytes	3.60ms	1.650ms	7 scans
FX5U, FX5UC*1*2	Send data length: 1 byte	1.27ms	0.586ms	3 scans
	Send data length: 1023 bytes	2.28ms	0.959ms	5 scans
	Send data length: 2046 bytes	3.35ms	1.390ms	8 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.

*2 The labels in the standard area are used.

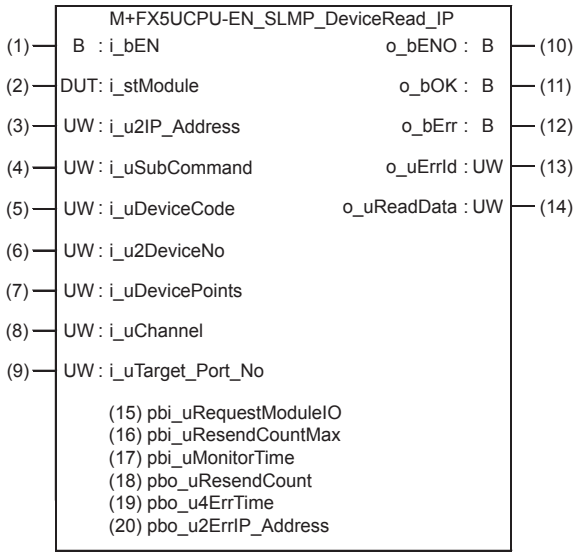
Error code

Error code (hexadecimal)	Description	Action
All error code	■FX5 CPU module Same as the error code caused by the data sending (SP.SOCSND) instruction. ■FX5-ENET, FX5-ENET/IP, FX5-EIP Same as the error code caused by the data sending (GP.SOCSND) instruction.	■FX5 CPU module Refer to the MELSEC iQ-F FX5 User's Manual (Communication). ■FX5-ENET Refer to the MELSEC iQ-F FX5 Ethernet Module User's Manual. ■FX5-ENET/IP Refer to the MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual. ■FX5-EIP Refer to the MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

2.5 M+FX5UCPU-EN_SLMP_DeviceRead_IP (Reading of SLMP-compatible device)

Overview

This FB reads data from the SLMP-compatible device by specifying IP address.



Labels

Input label

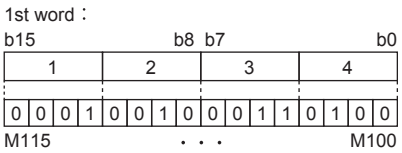
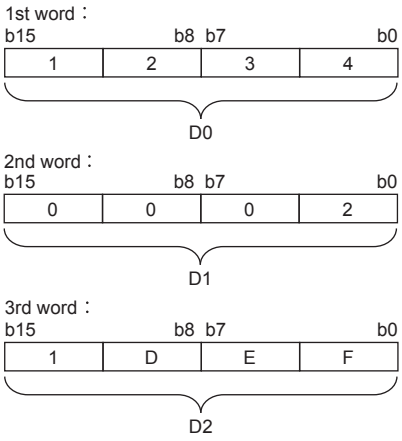
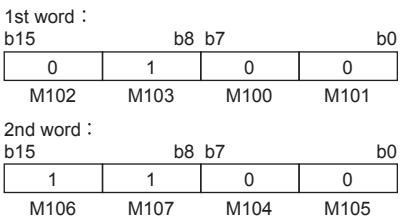
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. b15 b8 b7 b0 1st word: Third octet / Fourth octet 2nd word: First octet / Second octet Example: When IP address is 192.168.3.250 1st word: 03FAH 2nd word: C0A8H
(4)	i_uSubCommand	Sub command	Word [Unsigned]/Bit String [16-bit]	0 to 3	Specify the read unit and specification method of a device. ■0th bit Specify whether the device is read in units of words or in units of bits. • 0: In units of words • 1: In units of bits ■1st bit Specify the combination of the number of digits of the device code and start device number of the device to be read. • 0: Specify the device code in 2 digits and the start device number in 6 digits. • 1: Specify the device code in 4 digits and the start device number in 8 digits.*1

No.	Variable name	Name	Data type	Range	Description
(5)	i_uDeviceCode	Device code	Word [Unsigned]/Bit String [16-bit]	—	Specify the device code of the device to be read in binary code. • When the 1st bit of the subcommand is 0: 2 digits • When the 1st bit of the subcommand is 1: 4 digits
(6)	i_u2DeviceNo	Head device No.	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the start device number of the device to be read in binary code. • When the 1st bit of the subcommand is 0: 6 digits • When the 1st bit of the subcommand is 1: 8 digits
(7)	i_uDevicePoints	Number of device points	Word [Unsigned]/Bit String [16-bit]	1 to 960, 1 to 3972	Specify the number of device points of the device to be read in binary code. • When the 0th bit of the subcommand is 0: 1 to 960 digits • When the 0th bit of the subcommand is 1: 1 to 3972 digits*2
(8)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	—	Specify the channel to be used by own station.
(9)	i_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the UDP port number of target device.

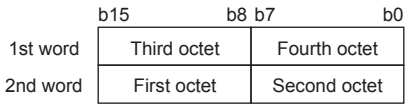
*1 It can be specified when the target device for reading is MELSEC iQ-R series. It cannot be specified when the target device for reading is MELSEC-Q/L series or MELSEC iQ-F series.

*2 The allowable range is 1 to 3584 when the target device for reading is MELSEC iQ-F series.

Output label

No.	Variable name	Name	Data type	Default value	Description
(10)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(11)	o_bOK	Normal completion	Bit	Off	Device reading has been completed normally when this output is on.
(12)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(13)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(14)	o_uReadData	Read data storage destination	Word [Unsigned]/Bit String [16-bit]	0	Specify the start device number of the device for storing the read data. • When the 0th bit of the subcommand is 0, the device data is read in units of words. Example: When reading the bit device M100 to M115 (one word) in units of words  Example: When reading the word device D0 to D2 in units of words  • When the 0th bit of the subcommand is 1, read the device data in units of bits. Example: When reading the bit device M100 to M107 in units of bits 

Public label

No.	Variable name	Name	Data type	Range	Description
(15)	pbi_uRequestModuleIO	Requested module I/O No.	Word [Unsigned]/Bit String [16-bit]	03FFH, 03E0H to 03E3H, 03D0H to 03D3H	Specify the module of the access destination. • 03FFH: Own station, control CPU • 03E0H: Multiple CPU No.1 • 03E1H: Multiple CPU No.2 • 03E2H: Multiple CPU No.3 • 03E3H: Multiple CPU No.4 • 03D0H: Control system CPU • 03D1H: Standby system CPU • 03D2H: System A CPU • 03D3H: System B CPU
(16)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(17)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in "maximum number of resends" is reached. • 0: 10s • 1 to 32767: 1 to 32767s
(18)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	The number of resends performed (result) is stored.
(19)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Lower 2 digits of year (00H to 99H) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Upper 2 digits of year (00H to 99H) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(20)	pbo_u2ErrIP_Address	Error-detected station IP address	Word [Unsigned]/Bit String [16-bit] (0..1)	—	The IP address of the station in which an error was detected is stored. The third and fourth octets are stored in the 1st word, and first and second octets are stored in the 2nd word. 

FB details

Available device

■CPU module

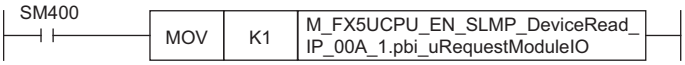
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	313 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 1.03K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

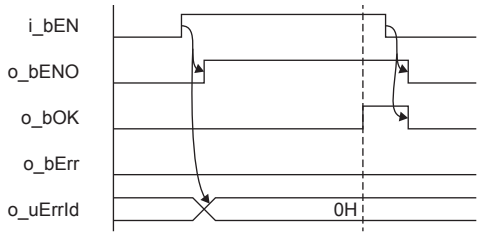
Processing

- When i_bEN (start condition) is turned on, this function reads device data from the SLMP-compatible device.
- This FB is executed specifying the IP address of target device.
- This FB uses Read command (command: 0401H) of SLMP. The message of the SLMP command is binary code. (📖MELSEC iQ-F FX5 User's Manual (Communication))
- If the set number of device points is out of the range, o_bErr (error completion) is turned on, and the processing of FB is suspended. Also, the error code 100 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 42 Error code.
- If an error occurs during device data read, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 42 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the requested module I/O No.(M_FX5UCPU_EN_SLMP_DeviceRead_IP_00A_1.pbi_uRequestModuleIO).

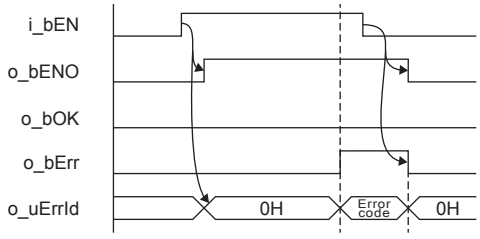


Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the SP.SLMPSND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the SP.SLMPSND instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, access devices (such as link direct device) that are accessed by the extension specification of SLMP cannot be read.
- In this FB, stations in other network cannot be set as the target station.
- For the port of target device where the remote password is set, execute this FB after performing the unlock processing of the remote password. When this FB is executed for the port of target device where the remote password is set, an error will occur.
- The target station must support "Read (command: 0401H)" of SLMP.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses UDP communications. Set the protocol setting of the target device to UDP.
- This FB requires circuit settings for all the input labels.

Parameter setting

No parameters are required to use this FB.

Example of use

For an example of use, refer to ☞ Page 286 EXAMPLE OF USE.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	0th bit of the subcommand: 0 Number of device points: 1	5.190ms	0.735ms	16 scans
	0th bit of the subcommand: 0 Number of device points: 960	11.400ms	0.869ms	25 scans
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	5.190ms	0.735ms	16 scans
	0th bit of the subcommand: 0 Number of device points: 960	11.400ms	0.869ms	25 scans
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	5.190ms	0.735ms	16 scans
	0th bit of the subcommand: 0 Number of device points: 960	11.400ms	0.869ms	25 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.

*2 The labels in the standard area are used.

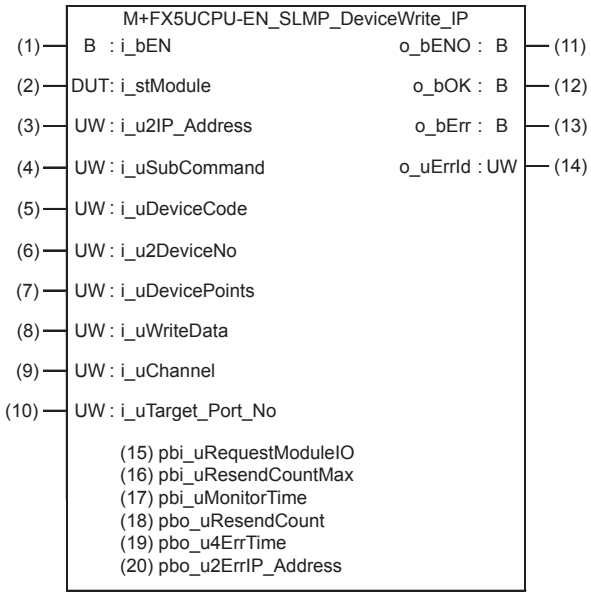
Error code

Error code (hexadecimal)	Description	Action
100H	The setting of i_uDevicePoints (number of device points) is out of the range. The set number of device points is out of the range from 1 to 960 (when the 0th bit of the sub command is 0) or out of the range from 1 to 3972 (when the 0th bit of the sub command is 1).	After reviewing the setting, re-execute the FB.
Error code other than 100H	Same as the error code caused by the SLMP frame sending (SP.SLMPSND) instruction.	Refer to the 📖MELSEC iQ-F FX5 User's Manual (Communication).

2.6 M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device)

Overview

This FB writes data to the SLMP-compatible device by specifying IP address.

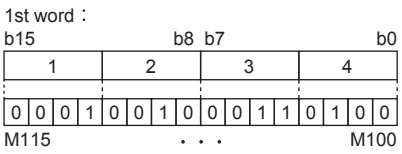
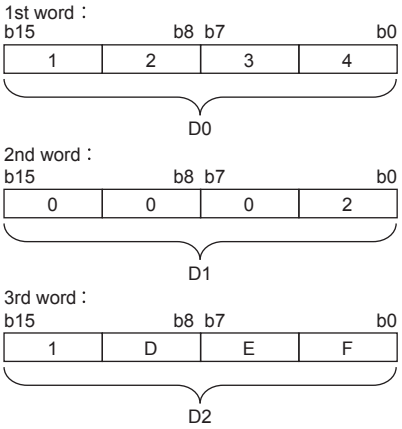
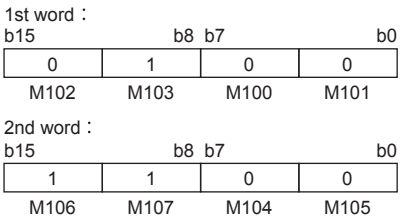


Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. b15 b8 b7 b0 1st word: Third octet | Fourth octet 2nd word: First octet | Second octet Example: When IP address is 192.168.3.250 1st word: 03FAH 2nd word: C0A8H

No.	Variable name	Name	Data type	Range	Description
(4)	i_uSubCommand	Sub command	Word [Unsigned]/Bit String [16-bit]	0 to 3	Specify the write unit and specification method of a device. ■0th bit Specify whether the device is written in units of words or in units of bits. • 0: In units of words • 1: In units of bits ■1st bit Specify the combination of the number of digits of the device code and start device number of the device to be written. • 0: Specify the device code in 2 digits and the start device number in 6 digits. • 1: Specify the device code in 4 digits and the start device number in 8 digits.*1
(5)	i_uDeviceCode	Device code	Word [Unsigned]/Bit String [16-bit]	—	Specify the device code of the device to be written in binary code. • When the 1st bit of the subcommand is 0: 2 digits • When the 1st bit of the subcommand is 1: 4 digits
(6)	i_u2DeviceNo	Head device No.	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the start device number of the device to be written in binary code. • When the 1st bit of the subcommand is 0: 6 digits • When the 1st bit of the subcommand is 1: 8 digits
(7)	i_uDevicePoints	Number of device points	Word [Unsigned]/Bit String [16-bit]	1 to 960, 1 to 3972	Specify the number of device points of the device to be written in binary code. • When the 0th bit of the subcommand is 0: 1 to 960 digits • When the 0th bit of the subcommand is 1: 1 to 3972 digits*2

No.	Variable name	Name	Data type	Range	Description
(8)	i_uWriteData	Write data storage destination	Word [Unsigned]/Bit String [16-bit]	—	Specify the start device number of the device for storing the write data. • When the 0th bit of the subcommand is 0, the device data is written in units of words. Example: When writing the bit device M100 to M115 (one word) in units of words  Example: When writing the word device D0 to D2 in units of words  • When the 0th bit of the subcommand is 1, the device data is written in units of bits. Example: When writing the bit device M100 to M107 in units of bits 
(9)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1	Specify the channel to be used by own station.
(10)	i_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the UDP port number of target device.

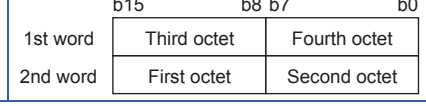
*1 It can be specified when the target device for writing is MELSEC iQ-R series. It cannot be specified when the target device for writing is MELSEC-Q/L series or MELSEC iQ-F series.

*2 The allowable range is 1 to 3584 when the target device for writing is MELSEC iQ-F series.

Output label

No.	Variable name	Name	Data type	Default value	Description
(11)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(12)	o_bOK	Normal completion	Bit	Off	Device writing has been completed normally when this output is on.
(13)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(14)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.

Public label

No.	Variable name	Name	Data type	Range	Description
(15)	pbi_uRequestModuleIO	Requested module I/O No.	Word [Unsigned]/Bit String [16-bit]	03FFH, 03E0H to 03E3H, 03D0H to 03D3H	Specify the module of the access destination. • 03FFH: Own station, control CPU • 03E0H: Multiple CPU No.1 • 03E1H: Multiple CPU No.2 • 03E2H: Multiple CPU No.3 • 03E3H: Multiple CPU No.4 • 03D0H: Control system CPU • 03D1H: Standby system CPU • 03D2H: System A CPU • 03D3H: System B CPU
(16)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(17)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in "maximum number of resends" is reached. • 0: 10s • 1 to 32767: 1 to 32767s
(18)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	The number of resends performed (result) is stored.
(19)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Lower 2 digits of year (00H to 99H) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Upper 2 digits of year (00H to 99H) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(20)	pbo_u2ErrIP_Address	Error-detected station IP address	Word [Unsigned]/Bit String [16-bit] (0..1)	—	The IP address of the station in which an error was detected is stored. The third and fourth octets are stored in the 1st word, and first and second octets are stored in the 2nd word. 

FB details

Available device

■CPU module

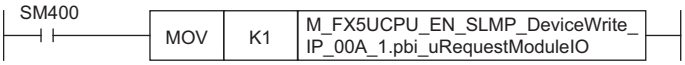
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	346 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 1.03K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

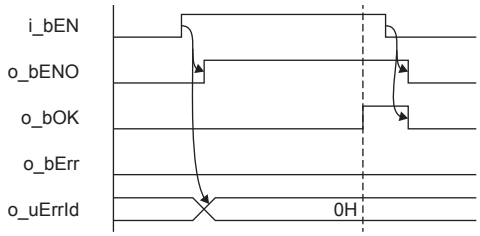
Processing

- When i_bEN (start condition) is turned on, this function writes device data of the SLMP-compatible device.
- This FB is executed specifying the IP address of target device.
- This FB uses Write command (command: 1401H) of SLMP. The message of the SLMP command is binary code. (📖MELSEC iQ-F FX5 User's Manual (Communication))
- If the set number of device points is out of the range, o_bErr (error completion) is turned on, and the processing of FB is suspended. Also, the error code 100 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 49 Error code.
- If an error occurs during device data write, o_bErr (error completion) turns on, and the error code is stored in o_uErrId (error code). For the error code, refer to ☞ Page 49 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the requested module I/O No.(M_FX5UCPU_EN_SLMP_DeviceWrite_IP_00A_1.pbi_uRequestModuleIO).

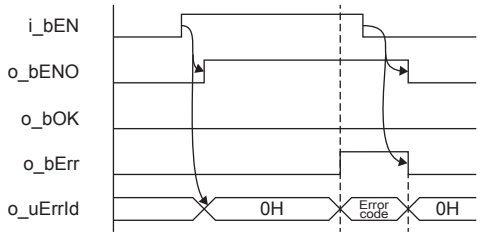


Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the SP.SLMPSND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the SP.SLMPSND instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, access devices (such as link direct device) that are accessed by the extension specification of SLMP cannot be written.
- In this FB, stations in other network cannot be set as the target station.
- For the port of target device where the remote password is set, execute this FB after performing the unlock processing of the remote password. When this FB is executed for the port of target device where the remote password is set, an error will occur.
- The target station must support "Write (command: 1401H)" of SLMP.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses UDP communications. Set the protocol setting of the target device to UDP.
- This FB requires circuit settings for all the input labels.

Parameter setting

No parameters are required to use this FB.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	0th bit of the subcommand: 0 Number of device points: 1	4.34ms	0.744ms	11 scans
	0th bit of the subcommand: 0 Number of device points: 960	11.0ms	0.90ms	20 scans
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	4.34ms	0.744ms	11 scans
	0th bit of the subcommand: 0 Number of device points: 960	11.0ms	0.90ms	20 scans
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	4.34ms	0.744ms	11 scans
	0th bit of the subcommand: 0 Number of device points: 960	11.0ms	0.90ms	20 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.

*2 The labels in the standard area are used.

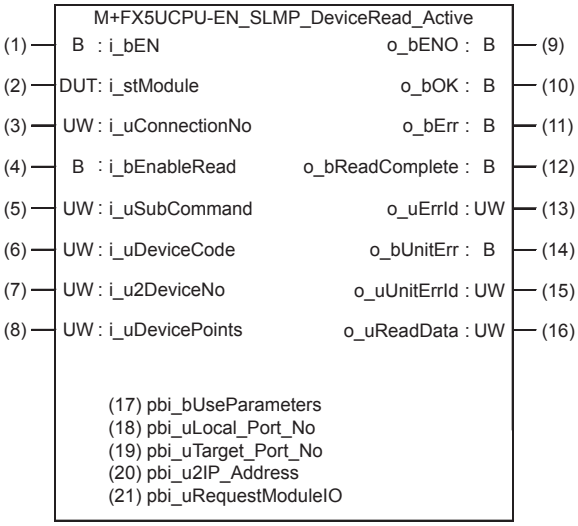
Error code

Error code (hexadecimal)	Description	Action
100H	The setting of i_uDevicePoints (number of device points) is out of the range. The set number of device points is out of the range from 1 to 960 (when the 0th bit of the sub command is 0) or out of the range from 1 to 3972 (when the 0th bit of the sub command is 1).	After reviewing the setting, re-execute the FB.
Error code other than 100H	Same as the error code caused by the SLMP frame sending (SP.SLMPSND) instruction.	Refer to the MELSEC iQ-F FX5 User's Manual (Communication).

2.7 M+FX5UCPU-EN_SLMP_DeviceRead_Active (Reading of SLMP-compatible device with Active connection)

Overview

This FB performs the open/close processing and reading device data of SLMP-compatible devices by Active connection.



Labels

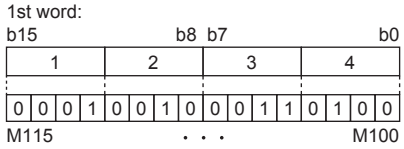
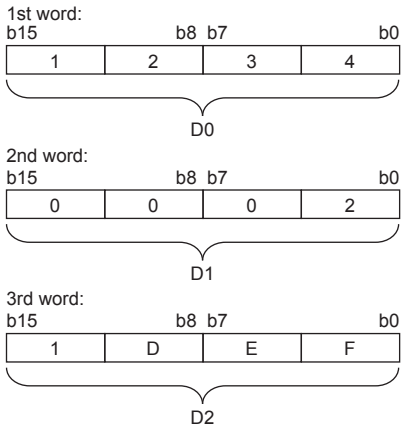
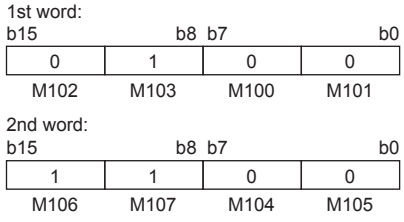
Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the connection number for receiving data.
(4)	i_bEnableRead	Reading execution	Bit	On, off	On: Execute reading Off: Not execute reading
(5)	i_uSubCommand	Sub command	Word [Unsigned]/Bit String [16-bit]	0 to 3	Specify the read unit and specification method of a device. ■0th bit Specify whether the device is read in units of words or in units of bits. • 0: In units of words • 1: In units of bits ■1st bit Specify the combination of the number of digits of the device code and start device number of the device to be read. • 0: Specify the device code in 2 digits and the start device number in 6 digits. • 1: Specify the device code in 4 digits and the start device number in 8 digits.*1
(6)	i_uDeviceCode	Device code	Word [Unsigned]/Bit String [16-bit]	—	Specify the device code of the device to be read in binary code. • When the 1st bit of the subcommand is 0: 2 digits • When the 1st bit of the subcommand is 1: 4 digits
(7)	i_u2DeviceNo	Head device No.	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the start device number of the device to be read in binary code. • When the 1st bit of the subcommand is 0: 6 digits • When the 1st bit of the subcommand is 1: 8 digits
(8)	i_uDevicePoints	Number of device points	Word [Unsigned]/Bit String [16-bit]	1 to 960, 1 to 3972	Specify the number of device points of the device to be read in binary code. • When the 0th bit of the subcommand is 0: 1 to 960 digits • When the 0th bit of the subcommand is 1: 1 to 3972 digits*2

*1 It can be specified when the target device for reading is MELSEC iQ-R Series. It cannot be specified when the target device for reading is MELSEC-Q/L series or MELSEC iQ-F series.

*2 The allowable range is 1 to 3584 when the target device for reading is MELSEC iQ-F series.

Output label

No.	Variable name	Name	Data type	Default value	Description
(9)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(10)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the opening of the connection has completed normally.
(11)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(12)	o_bReadComplete	Reading completion	Bit	Off	When this label is on, it indicates that the reading has completed normally.
(13)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(14)	o_bUnitErr	Module error outbreak flag	Bit	Off	The on state indicates that a module error has occurred.
(15)	o_uUnitErrId	Module error code	Word [Unsigned]/Bit String [16-bit]	0	The error code of an error occurred in the module is stored.
(16)	o_uReadData	Read data storage destination	Word [Unsigned]/Bit String [16-bit]	0	Specify the start device number of the device for storing the read data. • When the 0th bit of the subcommand is 0, the device data is read in units of words. Example: When reading the bit device M100 to M115 (one word) in units of words  Example: When reading the word device D0 to D2 in units of words  • When the 0th bit of the subcommand is 1, read the device data in units of bits. Example: When reading the bit device M100 to M107 in units of bits 

Public label

No.	Variable name	Name	Data type	Range	Description
(17)	pbi_bUseParameters	Parameter used	Bit	On, off	Specify whether to use the parameter values set by the engineering tool or the following operation parameter ((18) to (20)) values when processing for opening a connection. • Off: Performs open processing according to the target device configuration setting made by the engineering tool. (The following operation parameters ((18) to (20)) need not be set. Any settings are ignored if made.) • On: Performs open processing according to the following operation parameters ((18) to (20)).
(18)	pbi_uLocal_Port_No	Own node port number	Word [Unsigned]/ Bit String [16-bit]	1 to 5548, 5570 to 65534	Specify the port number of the own node. Own node port numbers 1 to 1023 are generally reserved port numbers, and 61440 to 65534 are used by other communication functions. Therefore, port numbers 1024 to 5548 and 5570 to 61439 should be used.
(19)	pbi_uTarget_Port_No	Destination port number	Word [Unsigned]/ Bit String [16-bit]	1 to 65534	Specify the destination port number.
(20)	pbi_u2IP_Address	IP address of target device	Word [Unsigned]/ Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device. b15 b8 b7 b0 1st word: Third octet | Fourth octet 2nd word: First octet | Second octet Example: When IP address is 192.168.3.250 1st word: 03FAH 2nd word: C0A8H
(21)	pbi_uRequestModuleIO	Requested module I/O No.	Word [Unsigned]/ Bit String [16-bit]	03FFH, 03E0H to 03E3H, 03D0H to 03D3H	Specify the module of the access destination. • 03FFH: Own station, control CPU • 03E0H: Multiple CPU No.1 • 03E1H: Multiple CPU No.2 • 03E2H: Multiple CPU No.3 • 03E3H: Multiple CPU No.4 • 03D0H: Control system CPU • 03D1H: Standby system CPU • 03D2H: System A CPU • 03D3H: System B CPU

FB details

Available device

■CPU module

Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.040S or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	960 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 1.05K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

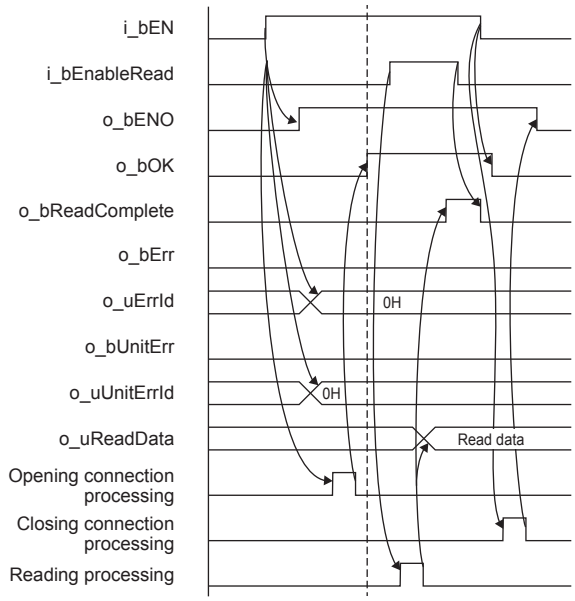
Processing

- Perform Active open processing by turning i_bEN (Execution command) on. When the connection is the open status, the open processing is not executed. After the open processing has completed, o_bOK (Normal completion) turns on.
- Perform Active close processing by turning i_bEN (Execution command) off. When the connection is the closed status, the close processing is not executed.
- Execute reading from the external device according to the description set for arguments of input by turning i_bEnableRead (Reading execution) on, and the data is output to o_uReadData (Read data storage destination).
- If the set number of device points is out of the range, o_bErr (error completion) is turned on, and the processing of FB is suspended. Also, the error code 100 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 57 Error code.
- The target connection needs to be opened by Active connection of TCP. When the connection is opened while these conditions are not satisfied, o_bErr (Error completion) turns on, and the FB processing is stopped. The error code 101 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 57 Error code.
- When an error has occurred in the open processing, close processing, or information reading processing of the connection, or the reading processing by SLMP, o_bUnitErr (Module error outbreak flag) turns on. Also, an error code is stored in o_uUnitErrId (Module error code). For the error code, refer to ☞ Page 57 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the requested module I/O No. (M_FX5UCPU_EN_SLMP_DeviceRead_Active_00A_1.pbi_uRequestModuleIO).

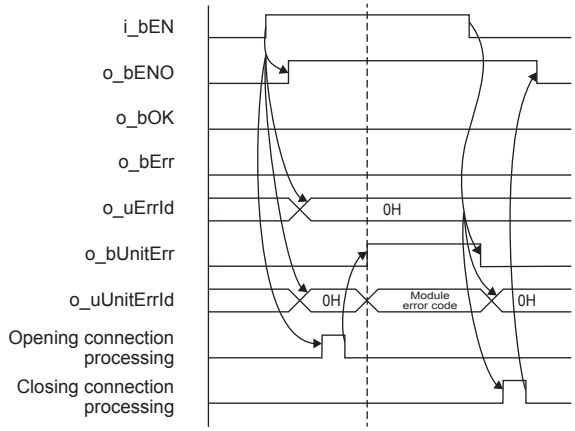


Timing chart of I/O signals

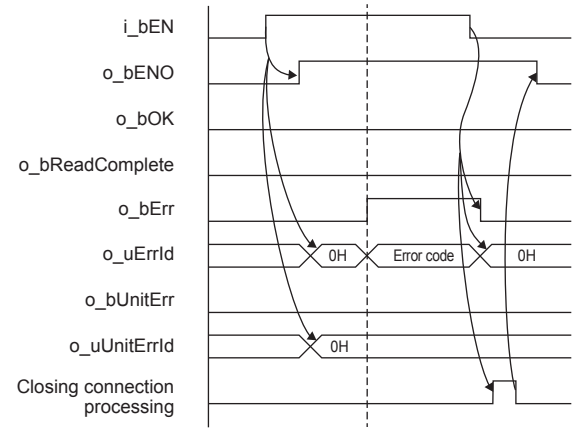
■For normal completion



■When a module error has occurred



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses SP.SOCCINF instruction, SP.SOCOPEN instruction, SP.SOCCLOSE instruction, SP.SOCRCV instruction, and SP.SOCSND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion), o_bErr (Error completion), or o_bUnitErr (Module error outbreak flag) turns on. By turning off i_bEN (Execution command), o_bOK (Normal completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) turn off, and then o_uErrId (Error code) and o_uUnitErrId (Module error code) are cleared to zero. However, when performing writing during RUN of this FB, o_bOK (Normal completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) may not be turned on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, access devices (such as link direct device) that are accessed by the extension specification of SLMP cannot be read.
- In this FB, stations in other network cannot be set as the target station.
- For the port of target device where the remote password is set, execute this FB after performing the unlock processing of the remote password. When this FB is executed for the port of target device where the remote password is set, an error will occur.
- The target station must support "Read (command: 0401H)" of SLMP.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses TCP communications. Set the protocol setting of the target device to TCP.
- This FB requires circuit settings for all the input labels.

Parameter setting

For the parameter setting, refer to ☞ Page 22 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	0th bit of the subcommand: 0 Number of device points: 1	7.65ms	1.24ms	12 scans
	0th bit of the subcommand: 0 Number of device points: 960	14.40ms	1.60ms	17 scans
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	6.35ms	0.743ms	12 scans
	0th bit of the subcommand: 0 Number of device points: 960	10.50ms	1.30ms	25 scans
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	5.49ms	0.477ms	15 scans
	0th bit of the subcommand: 0 Number of device points: 960	7.02ms	0.794ms	22 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

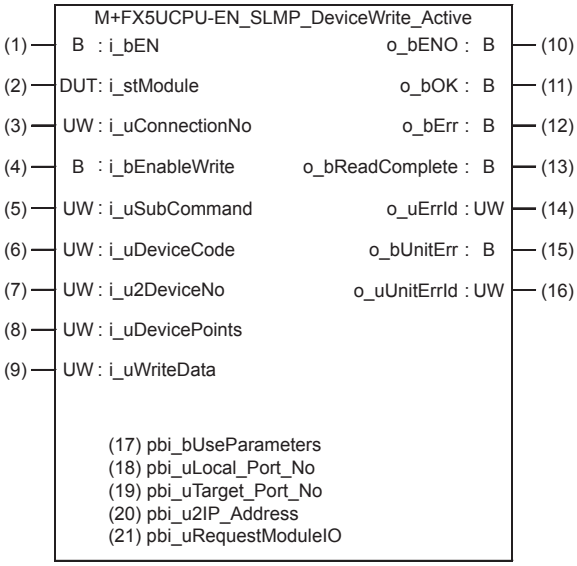
Error code

Error code (hexadecimal)	Description	Action
100H	The setting of i_uDevicePoints (number of device points) is out of the range. The set number of device points is out of the range from 1 to 960 (when the 0th bit of the sub command is 0) or out of the range from 1 to 3972 (when the 0th bit of the sub command is 1).	After reviewing the setting, re-execute the FB.
101H	The target connection is opened by any of the following conditions. • UDP/IP connection • Unpassive open • Fullpassive open	Close the target connection, review the setting and execute the FB again.
Error code other than the above	Same as the error code caused by the following instruction. Stored in o_uUnitErrId (Module error code). • Reading connection information (SP.SOCCINF) instruction • Opening a connection (SP.SOCOPEN) instruction • Closing a connection (SP.SOCCLOSE) instruction • Receive data (SP.SOCRCV) instruction • Send data (SP.SOCSND) instruction	Refer to the MELSEC iQ-F FX5 User's Manual (Communication).

2.8 M+FX5UCPU-EN_SLMP_DeviceWrite_Active (Writing to SLMP target device with Active connection)

Overview

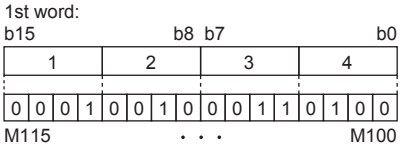
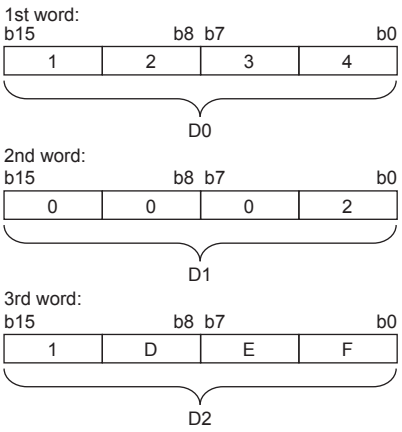
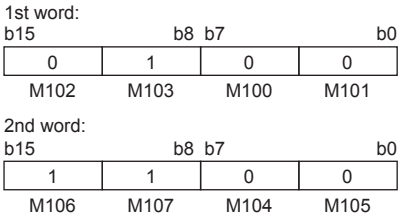
This FB performs the open/close processing and writing device data of SLMP-compatible devices by Active connection.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the connection number for sending data.
(4)	i_bEnableWrite	Writing execution	Bit	On, off	On: Execute writing Off: Not execute writing
(5)	i_uSubCommand	Sub command	Word [Unsigned]/Bit String [16-bit]	0 to 3	Specify the write unit and specification method of a device. ■0th bit Specify whether the device is written in units of words or in units of bits. • 0: In units of words • 1: In units of bits ■1st bit Specify the combination of the number of digits of the device code and start device number of the device to be written. • 0: Specify the device code in 2 digits and the start device number in 6 digits. • 1: Specify the device code in 4 digits and the start device number in 8 digits.*1
(6)	i_uDeviceCode	Device code	Word [Unsigned]/Bit String [16-bit]	—	Specify the device code of the device to be written in binary code. • When the 1st bit of the subcommand is 0: 2 digits • When the 1st bit of the subcommand is 1: 4 digits

No.	Variable name	Name	Data type	Range	Description
(7)	i_u2DeviceNo	Head device No.	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the start device number of the device to be written in binary code. • When the 1st bit of the subcommand is 0: 6 digits • When the 1st bit of the subcommand is 1: 8 digits
(8)	i_uDevicePoints	Number of device points	Word [Unsigned]/Bit String [16-bit]	1 to 960, 1 to 3972	Specify the number of device points of the device to be written in binary code. • When the 0th bit of the subcommand is 0: 1 to 960 digits • When the 0th bit of the subcommand is 1: 1 to 3972 digits*2
(9)	i_uWriteData	Write data storage destination	Word [Unsigned]/Bit String [16-bit]	—	Specify the start device number of the device for storing the write data. • When the 0th bit of the subcommand is 0, the device data is written in units of words. Example: When writing the bit device M100 to M115 (one word) in units of words  Example: When writing the word device D0 to D2 in units of words  • When the 0th bit of the subcommand is 1, the device data is written in units of bits. Example: When writing the bit device M100 to M107 in units of bits 

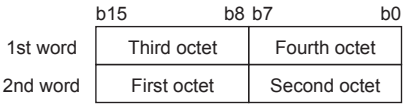
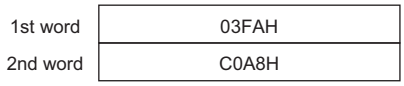
*1 It can be specified when the target device for writing is MELSEC iQ-R series. It cannot be specified when the target device for writing is MELSEC-Q/L series or MELSEC iQ-F series.

*2 The allowable range is 1 to 3584 when the target device for writing is MELSEC iQ-F series.

Output label

No.	Variable name	Name	Data type	Default value	Description
(10)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(11)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the opening of the connection has completed normally.
(12)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(13)	o_bWriteComplete	Writing completion	Bit	Off	When this label is on, it indicates that the writing has completed normally.
(14)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(15)	o_bUnitErr	Module error outbreak flag	Bit	Off	The on state indicates that a module error has occurred.
(16)	o_uUnitErrId	Module error code	Word [Unsigned]/Bit String [16-bit]	0	The error code of an error occurred in the module is stored.

Public label

No.	Variable name	Name	Data type	Range	Description
(17)	pbi_bUseParameters	Parameter used	Bit	On, off	Specify whether to use the parameter values set by the engineering tool or the following operation parameter ((18) to (20)) values when processing for opening a connection. • Off: Performs open processing according to the target device configuration setting made by the engineering tool. (The following operation parameters ((18) to (20)) need not be set. Any settings are ignored if made.) • On: Performs open processing according to the following operation parameters ((18) to (20)).
(18)	pbi_uLocal_Port_No	Own node port number	Word [Unsigned]/Bit String [16-bit]	1 to 5548, 5570 to 65534	Specify the port number of the own node. Own node port numbers 1 to 1023 are generally reserved port numbers, and 61440 to 65534 are used by other communication functions. Therefore, port numbers 1024 to 5548 and 5570 to 61439 should be used.
(19)	pbi_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the destination port number.
(20)	pbi_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device.  Example: When IP address is 192.168.3.250 
(21)	pbi_uRequestModuleIO	Requested module I/O No.	Word [Unsigned]/Bit String [16-bit]	03FFH, 03E0H to 03E3H, 03D0H to 03D3H	Specify the module of the access destination. • 03FFH: Own station, control CPU • 03E0H: Multiple CPU No.1 • 03E1H: Multiple CPU No.2 • 03E2H: Multiple CPU No.3 • 03E3H: Multiple CPU No.4 • 03D0H: Control system CPU • 03D1H: Standby system CPU • 03D2H: System A CPU • 03D3H: System B CPU

FB details

Available device

■CPU module

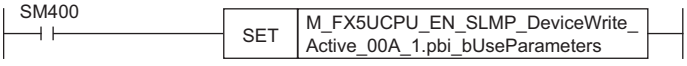
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.040S or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	836 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 1.05K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

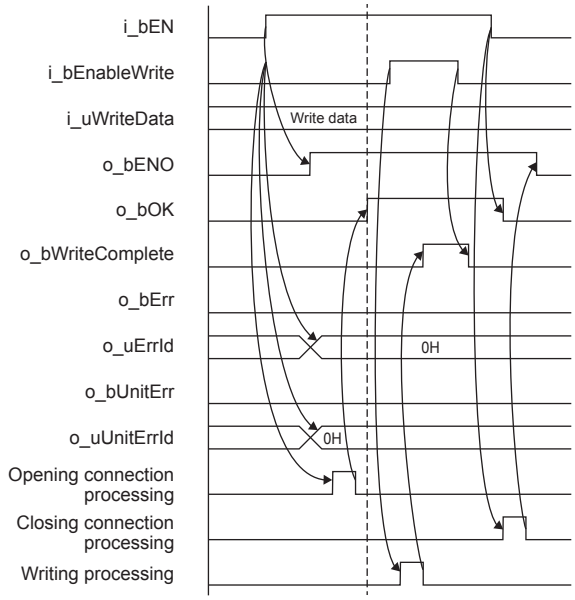
Processing

- Perform Active open processing by turning i_bEN (Execution command) on. When the connection is the open status, the open processing is not executed. After the open processing has completed, o_bOK (Normal completion) turns on.
- Perform Active close processing by turning i_bEN (Execution command) off. When the connection is the closed status, the close processing is not executed.
- Execute writing to the external device according to the description set for arguments of input by turning i_bEnableWrite (Writing execution) on. When the writing has completed normally, o_bWriteComplete (Writing completion) turns on.
- If the set number of device points is out of the range, o_bErr (error completion) is turned on, and the processing of FB is suspended. Also, the error code 100 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 64 Error code.
- The target connection needs to be opened by Active connection of TCP. When the connection is opened while these conditions are not satisfied, o_bErr (Error completion) turns on, and the FB processing is stopped. The error code 101 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 64 Error code.
- When an error has occurred in the open processing, close processing, or information writing processing of the connection, or the writing processing by SLMP, o_bUnitErr (Module error outbreak flag) turns on. Also, an error code is stored in o_uUnitErrId (Module error code). For the error code, refer to ☞ Page 64 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to turn on the parameters used (M_FX5UCPU_EN_SLMP_DeviceWrite_Active_00A_1.pbi_bUseParameters).

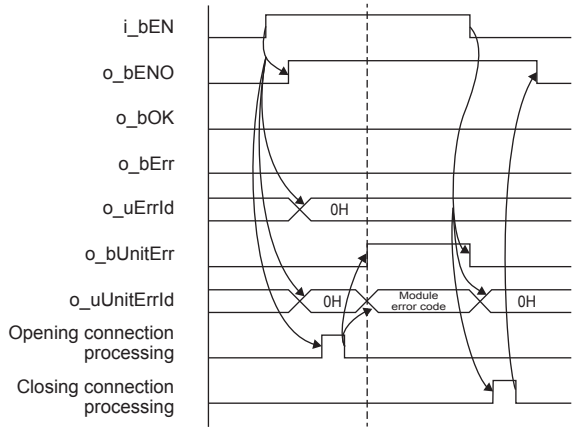


Timing chart of I/O signals

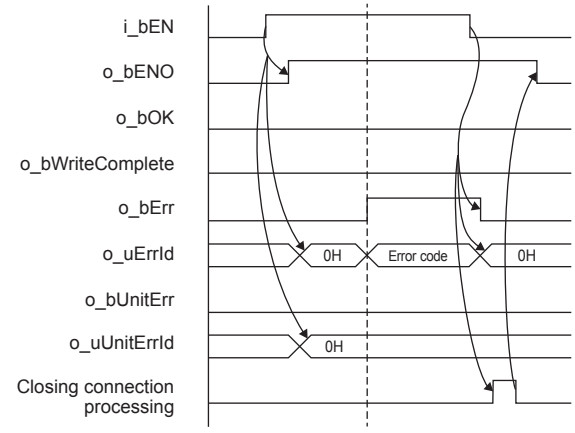
■For normal completion



■When a module error has occurred



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses SP.SOCCINF instruction, SP.SOCOPEN instruction, SP.SOCCLOSE instruction, SP.SOCRCV instruction, and SP.SOCSND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion), o_bErr (Error completion), or o_bUnitErr (Module error outbreak flag) turns on. By turning off i_bEN (Execution command), o_bOK (Normal completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) turn off, and then o_uErrId (Error code) and o_uUnitErrId (Module error code) are cleared to zero. However, when performing writing during RUN of this FB, o_bOK (Normal completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) may not be turned on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, access devices (such as link direct device) that are accessed by the extension specification of SLMP cannot be written.
- In this FB, stations in other network cannot be set as the target station.
- For the port of target device where the remote password is set, execute this FB after performing the unlock processing of the remote password. When this FB is executed for the port of target device where the remote password is set, an error will occur.
- The target station must support "Write (command: 1401H)" of SLMP.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses TCP communications. Set the protocol setting of the target device to TCP.
- This FB requires circuit settings for all the input labels.

Parameter setting

For the parameter setting, refer to ☞ Page 22 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	0th bit of the subcommand: 0 Number of device points: 1	5.98ms	0.769ms	15 scans
	0th bit of the subcommand: 0 Number of device points: 960	12.00ms	1.750ms	27 scans
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	5.98ms	0.769ms	15 scans
	0th bit of the subcommand: 0 Number of device points: 960	12.00ms	1.750ms	27 scans
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	5.98ms	0.769ms	15 scans
	0th bit of the subcommand: 0 Number of device points: 960	12.00ms	1.750ms	27 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

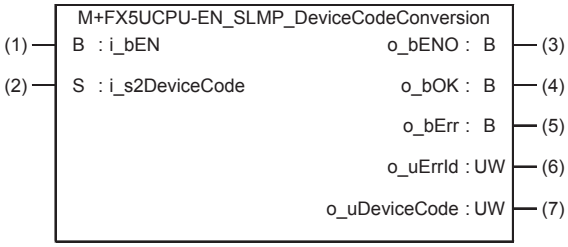
Error code

Error code (hexadecimal)	Description	Action
100H	The setting of i_uDevicePoints (number of device points) is out of the range. The set number of device points is out of the range from 1 to 960 (when the 0th bit of the sub command is 0) or out of the range from 1 to 3972 (when the 0th bit of the sub command is 1).	After reviewing the setting, re-execute the FB.
101H	The target connection is opened by any of the following conditions. • UDP/IP connection • Unpassive open • Fullpassive open	Close the target connection, review the setting and execute the FB again.
Error code other than the above	Same as the error code caused by the following instruction. Stored in o_uUnitErrId (Module error code). • Reading connection information (SP.SOCCINF) instruction • Opening a connection (SP.SOCOPEN) instruction • Closing a connection (SP.SOCCLOSE) instruction • Receive data (SP.SOCRCV) instruction • Send data (SP.SOCSND) instruction	Refer to the MELSEC iQ-F FX5 User's Manual (Communication).

2.9 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB)

Overview

This FB calculates the value to be input to the device code for SLMP communication FB.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_s2DeviceCode	Device code (input)	Character string (32) (0..1)	—	Stores the device code (string). (Ex.) When inputting the device code "LSTN" b15 b8 b7 b0 1st word: L S 2nd word: T N Input K0 in a part which characters are not input. For details on the device code, refer to the 📖MELSEC iQ-F FX5 User's Manual (Communication).

Output label

No.	Variable name	Name	Data type	Default value	Description
(3)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(4)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the conversion of the device code has completed normally.
(5)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(6)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(7)	o_uDeviceCode	Device code (output)	Word [Unsigned]/Bit String [16-bit]	0	Stores the converted device code.

FB details

Available device

■CPU module

Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.040S or later

Basic specifications

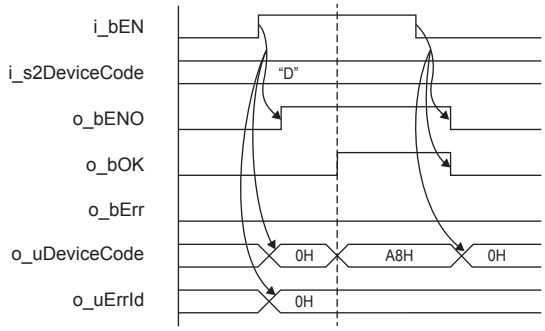
Item	Description
Language	Ladder diagram
Number of steps	580 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.04K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (single scan execution type)

Processing

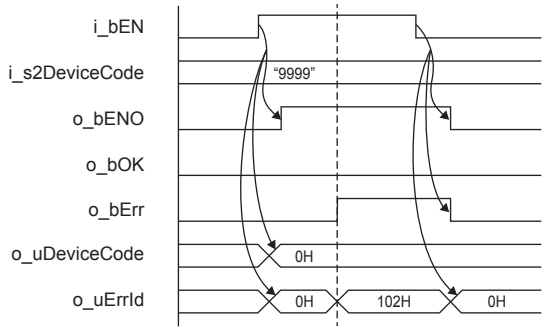
- Convert i_s2DeviceCode (device code (input)) to the binary code by turning i_bEN (Execution command) on, and the binary code is output to o_uDeviceCode (device code (output)).
- When the values of i_s2DeviceCode (device code (input)) are incorrect, o_bErr (Error completion) turns on, and the FB processing is stopped. The error code 102 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 68 Error code.

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).

Parameter setting

No parameters are required to use this FB.

Example of use

For an example of use, refer to ☞ Page 286 EXAMPLE OF USE.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	When the device code is W	0.516ms	1.620ms	1 scan
	When the device code is LSTN	0.514ms	1.560ms	1 scan
FX5UJ	When the device code is W	0.461ms	1.230ms	1 scan
	When the device code is LSTN	0.460ms	1.210ms	1 scan
FX5U, FX5UC*1*2	When the device code is W	0.372ms	0.816ms	1 scan
	When the device code is LSTN	0.376ms	0.812ms	1 scan

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

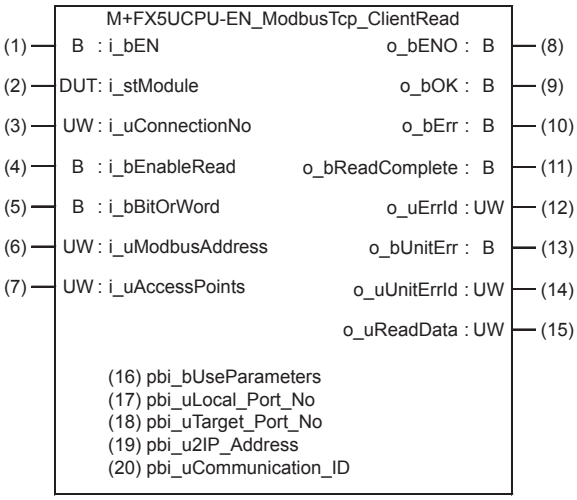
Error code

Error code (hexadecimal)	Description	Action
102H	The set values of i_s2DeviceCode (device code (input)) are incorrect.	Set the device code described in the MELSEC iQ-F FX5 User's Manual (Communication) or SLMP Reference Manual.

2.10 M+FX5UCPU-EN_ModbusTcp_ClientRead (Reading by MODBUS/TCP client)

Overview

This FB performs the open/close processing and reading by MODBUS/TCP client in socket communication.



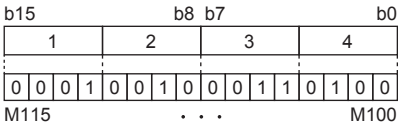
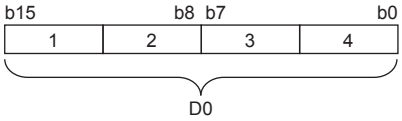
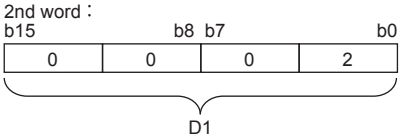
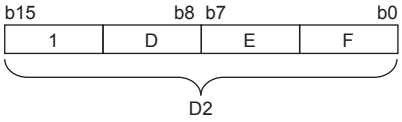
Labels

Input label

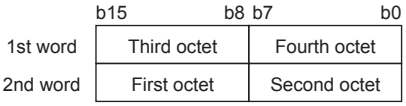
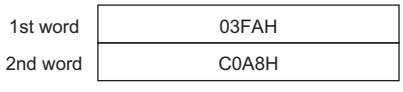
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the connection number for receiving data.
(4)	i_bEnableRead	Reading execution	Bit	On, off	On: Execute reading Off: Not execute reading
(5)	i_bBitOrWord	Bit/word selection	Bit	On, off	On: Select bit for read device Off: Select word for read device
(6)	i_uModbusAddress	MODBUS address	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	Specify the head MODBUS address which executes reading.
(7)	i_uAccessPoints	Access points	Word [Unsigned]/Bit String [16-bit]	1 to 2000, 1 to 125	When selecting bit: 1 to 2000 When selecting word: 1 to 125

Output label

No.	Variable name	Name	Data type	Default value	Description
(8)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(9)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the opening of the connection has completed normally.
(10)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(11)	o_bReadComplete	Reading completion	Bit	Off	When this label is on, it indicates that the reading has completed normally.
(12)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(13)	o_bUnitErr	Module error outbreak flag	Bit	Off	The on state indicates that a module error has occurred.

No.	Variable name	Name	Data type	Default value	Description
(14)	o_uUnitErrId	Module error code	Word [Unsigned]/Bit String [16-bit]	0	The error code of an error occurred in the module is stored.
(15)	o_uReadData	Read data storage destination	Word [Unsigned]/Bit String [16-bit]	0	The values read from the server device are stored in word units. • When bit/word selection is on, bit device is read. Example: When reading bit device M100 to M115 (for 1 word) 1st word：  • When bit/word selection is off, word device is read. Example: When reading word device D0 to D2 1st word：  2nd word：  3rd word： 

Public label

No.	Variable name	Name	Data type	Range	Description
(16)	pbi_bUseParameters	Parameter used	Bit	On, off	Specify whether to use the parameter values set by the engineering tool or the following operation parameter ((17) to (19)) values when processing for opening a connection. • Off: Performs open processing according to the target device configuration setting made by the engineering tool. (The following operation parameters ((17) to (19)) need not be set. Any settings are ignored if made.) • On: Performs open processing according to the following operation parameters ((17) to (19)).
(17)	pbi_uLocal_Port_No	Own node port number	Word [Unsigned]/Bit String [16-bit]	1 to 5548, 5570 to 65534	Specify the port number of the own node. Own node port numbers 1 to 1023 are generally reserved port numbers, and 61440 to 65534 are used by other communication functions. Therefore, port numbers 1024 to 5548 and 5570 to 61439 should be used.
(18)	pbi_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the destination port number.
(19)	pbi_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device.  Example: When IP address is 192.168.3.250 
(20)	pbi_uCommunication_ID	Communication ID	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	Client uses this label for matching with response message from the server.

FB details

Available device

■CPU module

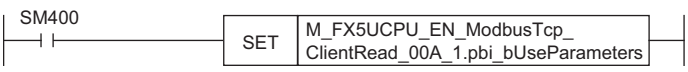
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.045X or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	813 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.18K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

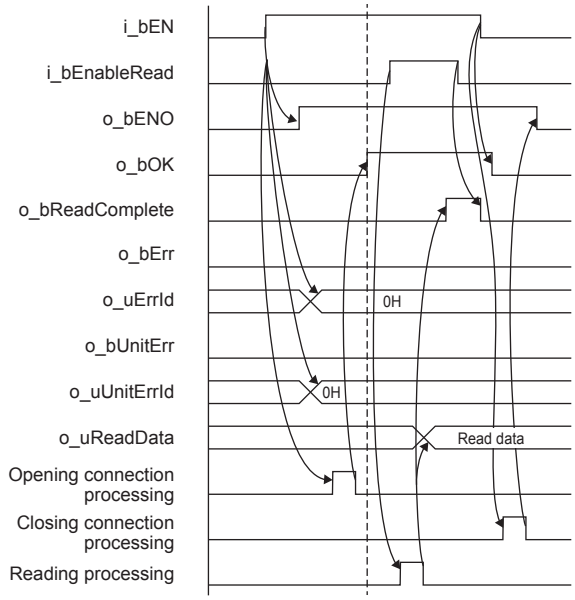
Processing

- Perform Active open processing by turning i_bEN (Execution command) on. When the connection is the open status, the open processing is not executed. After the open processing has completed, o_bOK (Normal completion) turns on.
- Perform Active close processing by turning i_bEN (Execution command) off. When the connection is the closed status, the close processing is not executed.
- Execute reading from the external device according to the description set for arguments of input by turning i_bEnableRead (Reading execution) on, and the data is output to o_uReadData (Read data storage destination).
- When the setting values of i_uAccessPoints (Access points) are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, the error code 100 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 74 Error code.
- The target connection needs to be opened by Active connection of TCP. When the connection is opened while these conditions are not satisfied, o_bErr (Error completion) turns on, and the FB processing is stopped. The error code 101 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 74 Error code.
- When an error has occurred in the reading processing of the open/close/information of the connection, or the reading processing by MODBUS/TCP client, o_bUnitErr (Module error outbreak flag) turns on. Also, an error code is stored in o_uUnitErrId (Module error code). For the error code, refer to ☞ Page 74 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 22 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to turn on the parameters used (M_FX5UCPU_EN_ModbusTcp_ClientRead_00A_1.pbi_bUseParameters).

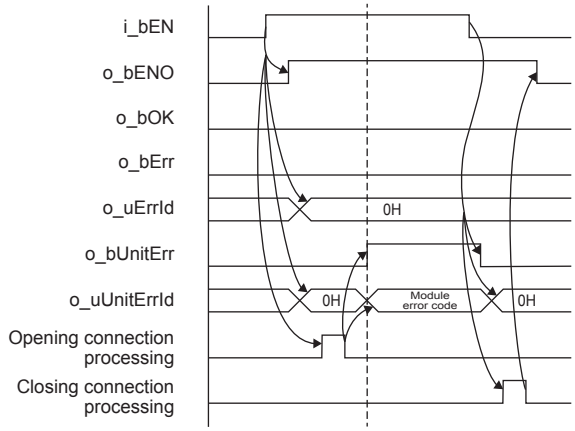


Timing chart of I/O signals

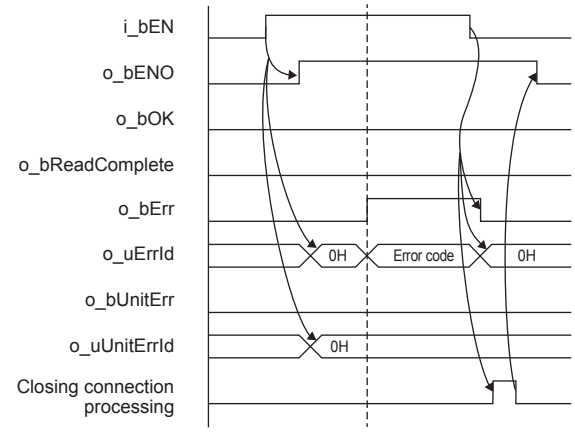
■For normal completion



■When a module error has occurred



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses SP.SOCCINF instruction, SP.SOCOPEN instruction, SP.SOCCLOSE instruction, SP.SOCRCV instruction, and SP.SOCSND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion), o_bReadComplete (Reading completion), o_bErr (Error completion), or o_bUnitErr (Module error outbreak flag) turns on. By turning off i_bEN (Execution command), o_bOK (Normal completion), o_bReadComplete (Reading completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) turn off, and then o_uErrId (Error code) and o_uUnitErrId (Module error code) are cleared to zero. However, when performing writing during RUN of this FB, o_bOK (Normal completion), o_bReadComplete (Reading completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) may not be turned on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, stations in other network cannot be set as the target station.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses TCP communications. Set the protocol setting of the target device to TCP.
- This FB requires circuit settings for all the input labels.

Parameter setting

For the parameter setting, refer to ☞ Page 22 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	Only opening	5.47ms	0.913ms	11 scans
	Reading processing of access points with one word after opening	5.72ms	0.746ms	12 scans
	Reading processing of access points with 125 words after opening	7.24ms	2.950ms	13 scans
FX5UJ	Only opening	5.26ms	0.757ms	14 scans
	Reading processing of access points with one word after opening	5.72ms	0.746ms	12 scans
	Reading processing of access points with 125 words after opening	7.16ms	1.770ms	15 scans
FX5U, FX5UC*1*2	Only opening	5.03ms	0.404ms	14 scans
	Reading processing of access points with one word after opening	4.84ms	0.410ms	16 scans
	Reading processing of access points with 125 words after opening	6.92ms	1.510ms	14 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

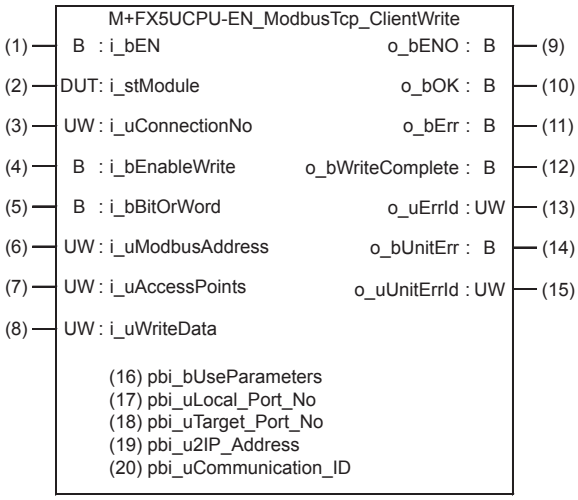
Error code

Error code (hexadecimal)	Description	Action
100H	The setting values of i_uAccessPoints (Access points) are out of range. Access points are set to the value other than 1 to 2000 (when bit is selected), or 1 to 125 (when word is selected).	After reviewing the setting, re-execute the FB.
101H	The target connection is opened by any of the following conditions. • UDP/IP connection • Unpassive open • Fullpassive open	Close the target connection, review the setting and execute the FB again.
Error code other than the above	Same as the error code caused by the following instruction. Stored in o_uUnitErrId (Module error code). • Reading connection information (SP.SOCCINF) instruction • Opening a connection (SP.SOCOPEN) instruction • Closing a connection (SP.SOCCLOSE) instruction • Receive data (SP.SOCRCV) instruction • Send data (SP.SOCSND) instruction	Refer to the MELSEC iQ-F FX5 User's Manual (Communication).

2.11 M+FX5UCPU-EN_ModbusTcp_ClientWrite (Writing by MODBUS/TCP client)

Overview

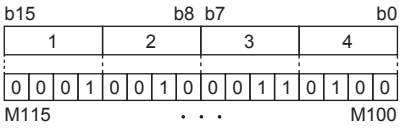
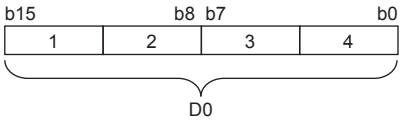
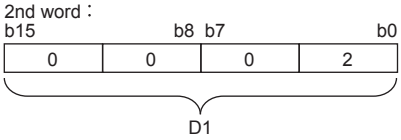
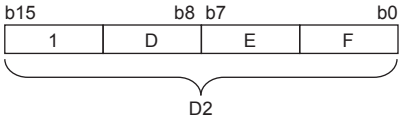
This FB performs the open/close processing and writing by MODBUS/TCP client in socket communication.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the connection number for sending data.
(4)	i_bEnableWrite	Writing execution	Bit	On, off	On: Execute writing Off: Not execute writing
(5)	i_bBitOrWord	Bit/word selection	Bit	On, off	On: Select bit for write device Off: Select word for write device
(6)	i_uModbusAddress	MODBUS address	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	Specify the head MODBUS address which executes writing.
(7)	i_uAccessPoints	Access points	Word [Unsigned]/Bit String [16-bit]	1 to 1968, 1 to 123	When selecting bit: 1 to 1968 When selecting word: 1 to 123

No.	Variable name	Name	Data type	Range	Description
(8)	i_uWriteData	Write data storage destination	Word [Unsigned]/Bit String [16-bit]	—	The values to be written to the server device are stored in word units. • When bit/word selection is on, the values are written to bit device. Example: When writing to bit device M100 to M115 (for 1 word) 1st word：  • When bit/word selection is off, the values are written to word device. Example: When writing to word device D0 to D2 1st word：  2nd word：  3rd word： 

Output label

No.	Variable name	Name	Data type	Default value	Description
(9)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(10)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the opening of the connection has completed normally.
(11)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(12)	o_bWriteComplete	Writing completion	Bit	Off	When this label is on, it indicates that the writing has completed normally.
(13)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(14)	o_bUnitErr	Module error outbreak flag	Bit	Off	The on state indicates that a module error has occurred.
(15)	o_uUnitErrId	Module error code	Word [Unsigned]/Bit String [16-bit]	0	The error code of an error occurred in the module is stored.

Public label

No.	Variable name	Name	Data type	Range	Description
(16)	pbi_bUseParameters	Parameter used	Bit	On, off	Specify whether to use the parameter values set by the engineering tool or the following operation parameter ((17) to (19)) values when processing for opening a connection. • Off: Performs open processing according to the target device configuration setting made by the engineering tool. (The following operation parameters ((17) to (19)) need not be set. Any settings are ignored if made.) • On: Performs open processing according to the following operation parameters ((17) to (19)).
(17)	pbi_uLocal_Port_No	Own node port number	Word [Unsigned]/Bit String [16-bit]	1 to 5548, 5570 to 65534	Specify the port number of the own node. Own node port numbers 1 to 1023 are generally reserved port numbers, and 61440 to 65534 are used by other communication functions. Therefore, port numbers 1024 to 5548 and 5570 to 61439 should be used.
(18)	pbi_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the destination port number.
(19)	pbi_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device. b15 b8 b7 b0 1st word: Third octet | Fourth octet 2nd word: First octet | Second octet Example: When IP address is 192.168.3.250 1st word: 03FAH 2nd word: C0A8H
(20)	pbi_uCommunication_ID	Communication ID	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	Client uses this label for matching with response message from the server.

FB details

Available device

■CPU module

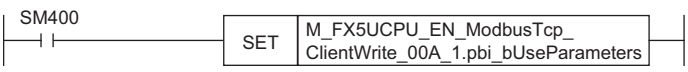
Target module	Firmware version	Engineering tool
FX5S	1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	1.040 or later	GX Works3 Version 1.045X or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	883 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.18K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

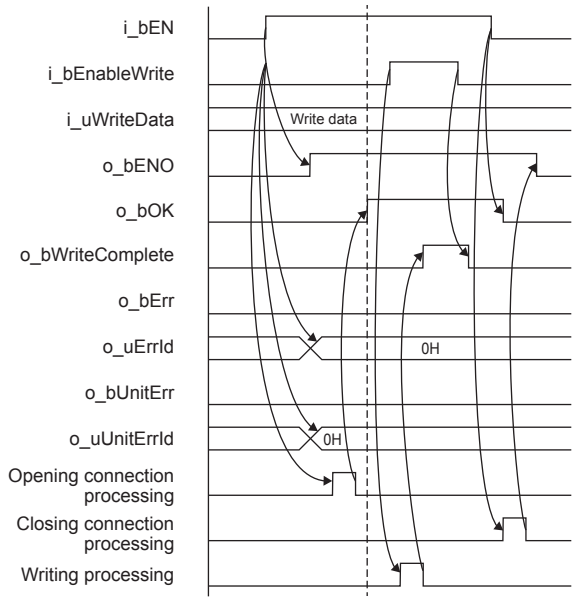
Processing

- Perform Active open processing by turning i_bEN (Execution command) on. When the connection is the open status, the open processing is not executed. After the open processing has completed, o_bOK (Normal completion) turns on.
- Perform Active close processing by turning i_bEN (Execution command) off. When the connection is the closed status, the close processing is not executed.
- Execute writing to the external device according to the description set for arguments of input by turning i_bEnableWrite (Writing execution) on. When the writing has completed normally, o_bWriteComplete (Writing completion) turns on.
- When the setting values of i_uAccessPoints (Access points) are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, the error code 100 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 81 Error code.
- The target connection needs to be opened by Active connection of TCP. When the connection is opened while these conditions are not satisfied, o_bErr (Error completion) turns on, and the FB processing is stopped. The error code 101 (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 81 Error code.
- When an error has occurred in the writing processing of the open/close/information of the connection, or the writing processing by MODBUS/TCP client, o_bUnitErr (Module error outbreak flag) turns on. Also, an error code is stored in o_uUnitErrId (Module error code). For the error code, refer to ☞ Page 81 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 22 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to turn on the parameters used (M_FX5UCPU_EN_ModbusTcp_ClientWrite_00A_1.pbi_bUseParameters).

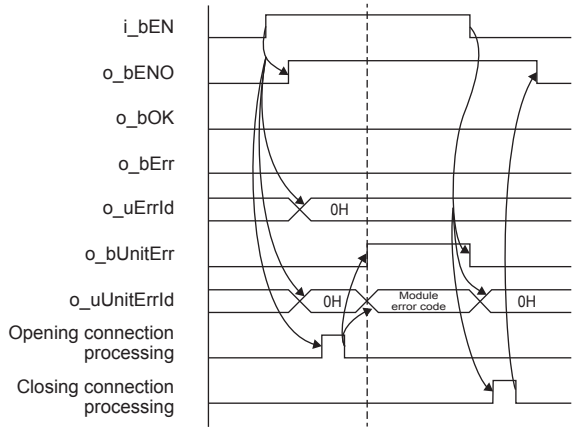


Timing chart of I/O signals

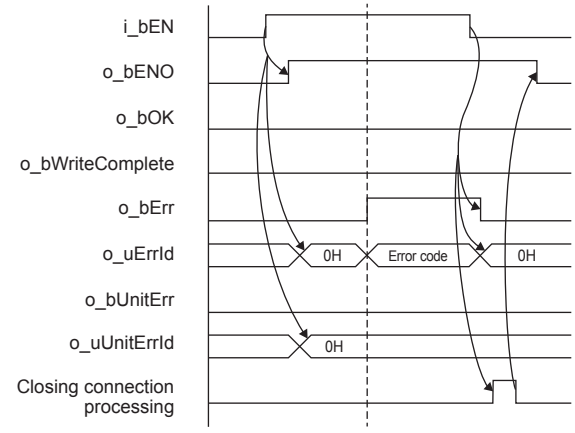
■For normal completion



■When a module error has occurred



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses SP.SOCCINF instruction, SP.SOCOPEN instruction, SP.SOCCLOSE instruction, SP.SOCRCV instruction, and SP.SOCSND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion), o_bWriteComplete (Writing completion), o_bErr (Error completion), or o_bUnitErr (Module error outbreak flag) turns on. By turning off i_bEN (Execution command), o_bOK (Normal completion), o_bWriteComplete (Writing completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) turn off, and then o_uErrId (Error code) and o_uUnitErrId (Module error code) are cleared to zero. However, when performing writing during RUN of this FB, o_bOK (Normal completion), o_bWriteComplete (Writing completion), o_bErr (Error completion), and o_bUnitErr (Module error outbreak flag) may not be turned on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, stations in other network cannot be set as the target station.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses TCP communications. Set the protocol setting of the target device to TCP.
- This FB requires circuit settings for all the input labels.

Parameter setting

For the parameter setting, refer to ☞ Page 22 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5S	Only opening	29.60ms	10.300ms	2 scans
	Writing processing of access points with one bit after opening	5.450ms	0.428ms	14 scans
	Writing processing of access points with 1968 bits after opening	39.00ms	12.600ms	4 scans
FX5UJ	Only opening	29.60ms	10.300ms	2 scans
	Writing processing of access points with one bit after opening	5.450ms	0.428ms	14 scans
	Writing processing of access points with 1968 bits after opening	39.00ms	12.600ms	4 scans
FX5U, FX5UC*1*2	Only opening	29.60ms	10.300ms	2 scans
	Writing processing of access points with one bit after opening	5.450ms	0.428ms	14 scans
	Writing processing of access points with 1968 bits after opening	39.00ms	12.600ms	4 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

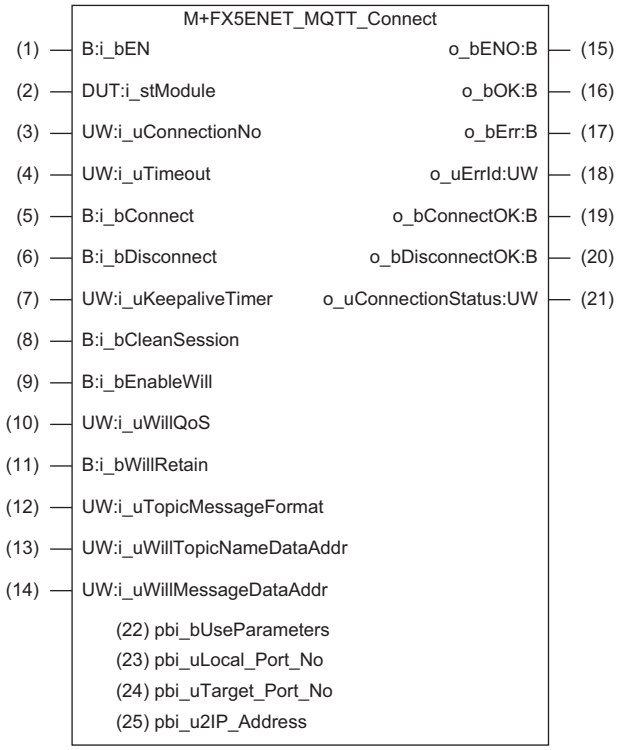
Error code

Error code (hexadecimal)	Description	Action
100H	The setting values of i_uAccessPoints (Access points) are out of range. Access points are set to the value other than 1 to 1968 (when bit is selected), or 1 to 123 (when word is selected).	After reviewing the setting, re-execute the FB.
101H	The target connection is opened by any of the following conditions. • UDP/IP connection • Unpassive open • Fullpassive open	Close the target connection, review the setting and execute the FB again.
Error code other than the above	Same as the error code caused by the following instruction. Stored in o_uUnitErrId (Module error code). • Reading connection information (SP.SOCCINF) instruction • Opening a connection (SP.SOCOPEN) instruction • Closing a connection (SP.SOCCLOSE) instruction • Receive data (SP.SOCRCV) instruction • Send data (SP.SOCSND) instruction	Refer to the MELSEC iQ-F FX5 User's Manual (Communication).

2.12 M+FX5ENET_MQTT_Connect (MQTT connection establishment)

Overview

This FB controls the connection with an MQTT broker (server) to establish a TCP or TLS session on the CONNECT instruction or to disconnect the session on the DISCONNECT instruction.



Labels

Input label

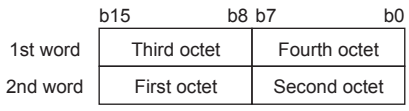
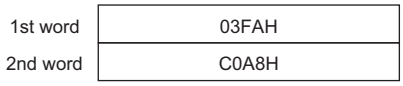
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_uTimeout	Timeout setting	Word [Unsigned]/ Bit String [16-bit]	1 to 65535	Specify the connection timeout (s).
(5)	i_bConnect	CONNECT instruction	Bit	On, off	Turn on this label when establishing a TCP or TLS session.
(6)	i_bDisconnect	DISCONNECT instruction	Bit	On, off	Turn on this label when disconnecting a TCP or TLS session.
(7)	i_uKeepaliveTimer	keepalive timer	Word [Unsigned]/ Bit String [16-bit]	0 to 65535	Specify the KeepAlive timer (s) to an MQTT broker.
(8)	i_bCleanSession	Clean session setting	Bit	On, off	Select the operation when the communication is disconnected once and it is reconnected while the FX5-ENET (MQTT client) is communicating with the MQTT broker. • Off: Stored • On: Not stored ■The operation when off (Stored) is selected Since the MQTT broker stores Topic to which the FX5-ENET has subscribed before the communication disconnection, the message that the MQTT broker has received while the communications are disconnected can be received when the FX5-ENET is connected again. QoS 0 message may not be received by the server and service. ■The operation when on (Not stored) is selected The message that the MQTT broker has received while the communications are disconnected cannot be received when the FX5-ENET is connected again.
(9)	i_bEnableWill	Enable Will	Bit	On, off	On: Will is enabled. Off: Will is disabled.
(10)	i_uWillQoS	Will QoS	Word [Unsigned]/ Bit String [16-bit]	0 to 2	Specify the QoS to be used for sending Will.
(11)	i_bWillRetain	Will Retain	Bit	On, off	Specify the Retain flag of Will messages.
(12)	i_uTopicMessageFormat	Will topic/message format (ASCII/Unicode string[*1] specification)	Word [Unsigned]/ Bit String [16-bit]	0 to 1	Specify the character code of Will topic/message.[*2] • 0: ASCII is used for Will topic/message. • 1: The Unicode string[*1] is used for Will topic/message.
(13)	i_uWillTopicNameDataAddr	Will topic name data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which the Will message topic name is stored.[*3] ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end)
(14)	i_uWillMessageDataAddr	Will message data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which the Will message content is stored.[*4] ■Maximum number of characters • For ASCII: 500 characters (excluding NULL at the end) • For Unicode: 250 characters (excluding NULL at the end)

*1 For GX Works3, the Unicode string is UTF-16.
*2 The mixture of the ASCII code and Unicode strings cannot be specified.
*3 The Will topic name data area is treated as 511 bytes (excluding NULL).
*4 The Will message data area is treated as 500 bytes (excluding NULL).

Output label

No.	Variable name	Name	Data type	Default value	Description
(15)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(16)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(17)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(18)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(19)	o_bConnectOK	Establishment completion	Bit	Off	When this label is on, it indicates that Connect has been processed normally.
(20)	o_bDisconnectOK	Disconnection completion	Bit	Off	When this label is on, it indicates that Disconnect has been processed normally.
(21)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

Public label

No.	Variable name	Name	Data type	Range	Description
(22)	pbi_bUseParameters	Parameter used	Bit	On, off	Specify whether to use the parameter values set by the engineering tool or the following operation parameter ((23) to (25)) values when processing for opening a connection. • Off: Performs open processing according to the target device configuration setting made by the engineering tool. (The following operation parameters ((23) to (25)) need not be set. Any settings are ignored if made.) • On: Performs open processing according to the following operation parameters ((23) to (25)).
(23)	pbi_uLocal_Port_No	Own node port number	Word [Unsigned]/Bit String [16-bit]	1 to 5548, 5570 to 65534	Specify the port number of the own node. Own node port numbers 1 to 1023 are generally reserved port numbers, and 61440 to 65534 are used by other communication functions. Therefore, port numbers 1024 to 5548 and 5570 to 61439 should be used.
(24)	pbi_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the destination port number.
(25)	pbi_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.255	Specify the IP address of the target device.  Example: When IP address is 192.168.3.250 

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■CPU module

Target module	Firmware version	Engineering tool
FX5U, FX5UC	1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	1.040 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	845 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 1.67K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 1 point (Device number: Z9) • Long index register: 0 points When using an interrupt program, do not use the index register within the interrupt program.
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

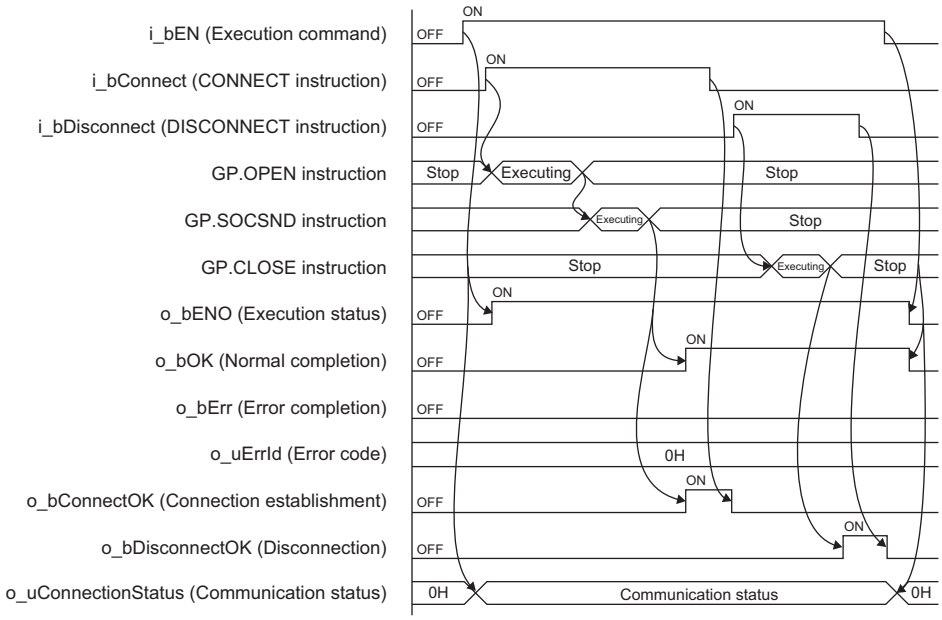
Processing

- After i_bEN (Execution command) turns on, a session is established by turning on i_bConnect (CONNECT instruction) and is disconnected by turning on i_bDisconnect (DISCONNECT instruction).
- After i_bEN (Execution command) turns on, o_bOK (Normal completion) turns on when the first session is completely established or disconnected.
- When the session is completely established, o_bConnectOK (Establishment completion) turns on. When i_bConnect (CONNECT instruction) turns off from on, o_bSendOK (Establishment completion) turns off.
- When the session is completely disconnected, o_bDisconnectOK (Disconnection completion) turns on. When i_bDisconnect (DISCONNECT instruction) turns off from on, o_bDisconnectOK (Disconnection completion) turns off.
- If an error occurs during establishment/disconnection of the session, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108975) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

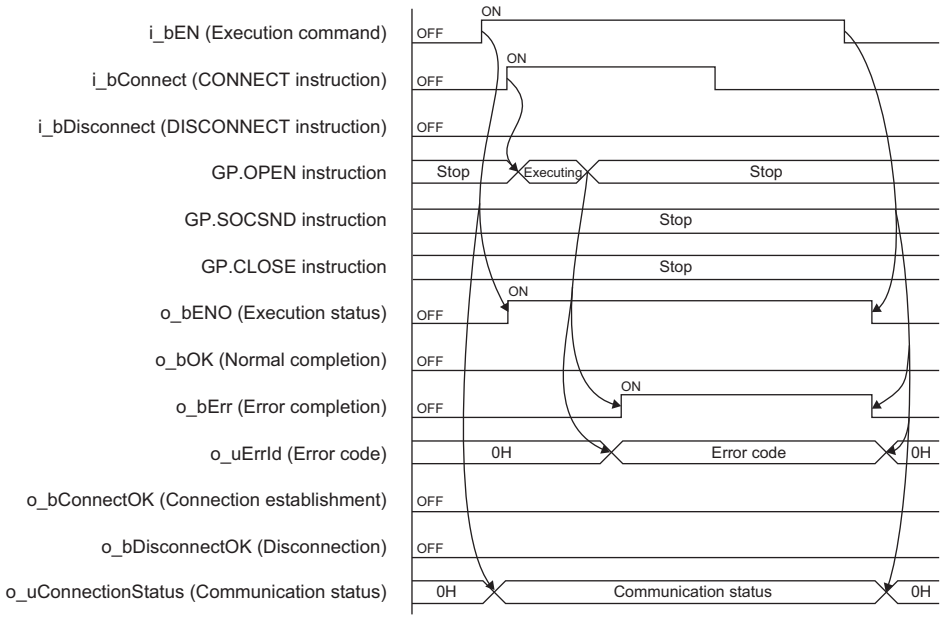
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion (Starting when i_bConnect or i_bDissconnect turns on)



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

GP.OPEN instruction
GP.SOCSND instruction
GP.CLOSE instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- The i_uKeepaliveTimer (keepalive timer) value does not always apply. Some connection target devices may be disconnected before the time set with i_uKeepaliveTimer (keepalive timer).
- Do not concurrently turn on i_bConnect (CONNECT instruction) and i_bDisconnect (DISCONNECT instruction).
- When using more than one of this FB, do not concurrently turn on i_bConnect (CONNECT instruction) or i_bDisconnect (DISCONNECT instruction) of the more than one FBs.
- Do not concurrently execute this FB and any other Ethernet module dedicated instruction or any FB including an Ethernet module dedicated instruction. For example, do not concurrently turn on the GP.SOCSND instruction and i_bConnect (CONNECT instruction) or i_bDisconnect (DISCONNECT instruction) of this FB, or do not concurrently turn on i_bEN (Execution command) of M+FX5ENET_MQTT_Receive (Receiving of MQTT data) FB and i_bConnect (CONNECT instruction) or i_bDisconnect (DISCONNECT instruction) of this FB.

Parameter setting

Set the target device connection configuration on MQTT communication by using GX Works3.

Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-ENET] ⇨ [Basic Settings] ⇨ [External Device Configuration]

In the target device connection configuration setting, set the protocol to the TLS connection or TCP connection. Set the certificate by using Certificate Configuration Tool for FX5-ENET. For details on the setting method, refer to the following.

MELSEC iQ-F FX5 Ethernet Module User's Manual

Performance value

CPU module	Input label	Performance value		Number of scans
	CONNECT/DISCONNECT	Processing time	Maximum scan time	
FX5UJ*1	CONNECT	509.000ms	1.340ms	1219 scans
	DISCONNECT	180.000ms	1.410ms	259 scans
FX5U, FX5UC*1*2*3	CONNECT	493.000ms	1.140ms	1425 scans
	DISCONNECT	180.000ms	1.250ms	305 scans

*1 A personal computer in the same LAN is connected via a hub.
*2 When the program capacity is set to 128K steps, the processing speed may be reduced.
*3 The labels in the standard area are used.

Error code

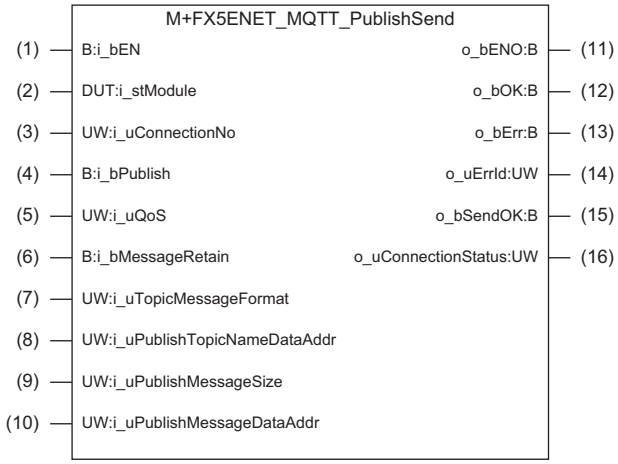
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	Contention has occurred between i_bConnect (CONNECT instruction) and i_bDisconnect (DISCONNECT instruction).	After reviewing the setting, re-execute the FB.
102H	The i_uWillQoS (WillQoS) setting value is out of range.	After reviewing the setting, re-execute the FB.
103H	The i_uTimeout (Timeout value) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uTopicMessageFormat (Will topic/message format) setting value is out of range.	After reviewing the setting, re-execute the FB.
120H	The i_uWillTopicNameDataAddr (Will topic name data start address) topic name is not set.	After setting the topic name with one or more characters, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
210H	There is an overlapping part in the following two areas. Otherwise, the range of file register areas is exceeded. • Will topic data area • Will message data area	Set the following two areas so that no overlap occurs. • Will topic data area • Will message data area After reviewing the setting, re-execute the FB.
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.13 M+FX5ENET_MQTT_PublishSend (Sending of MQTT data)

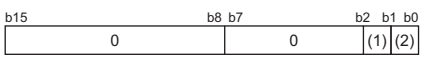
Overview

This FB sends a message to an MQTT broker (server).



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_bPublish	PUBLISH instruction (Rise detection)	Bit	On, off	Sends data on the PUBLISH command.
(5)	i_uQoS	QoS	Word [Unsigned]/ Bit String [16-bit]	0 to 2	Specify the QoS level to be used for send.
(6)	i_bMessageRetain	Retain send message	Bit	On, off	Specify the Retain flag of the PUBLISH command.
(7)	i_uTopicMessageFormat	Topic/message format[*1] specification	Word [Unsigned]/ Bit String [16-bit]	0 to 3	Specify the character code of topic/message. • 0 (b1 = 0, b0 = 0): ASCII is used for topic/message. • 1 (b1 = 0, b0 = 1): The Unicode string[*1] is used for topic/message. • 2 (b1 = 1, b0 = 0): ASCII is used for topic and binary is used for message. • 3 (b1 = 1, b0 = 1): The Unicode string[*1] is used for topic and binary is used for message.  • (1): Binary is specified for message. • (2): ASCII/UTF-16 is specified for topic/message.

No.	Variable name	Name	Data type	Range	Description
(8)	i_uPublishTopicNameDataAddr	Publish topic name data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which the send message topic name is stored.*4 ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end) ASCII/Unicode string*1
(9)	i_uPublishSendMessageSize	Publish message size	Word [Unsigned]/ Bit String [16-bit]	0 to 32768	Specify the send message size. When 0 is specified, the send message size is automatically set.*2*3 If the number of characters reaches the maximum length, manually set NULL at the position of the maximum length + 1 in the send message. Therefore, secure a space of 32768 bytes.
(10)	i_uPublishSendMessageDataAddr	Publish message data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which the send message content is stored. Binary/ASCII/Unicode string*1

*1 For GX Works3, the Unicode string is UTF-16.
*2 The Publish message data area is treated as 32768 bytes (excluding NULL).
*3 When i_uTopicMessageFormat (Topic/message format) is binary, this area is treated as 0 byte data.
*4 The Publish topic name data area is treated as 511 bytes (excluding NULL).

Output label

No.	Variable name	Name	Data type	Default value	Description
(11)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(12)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(13)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(14)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(15)	o_bSendOK	Send completion	Bit	Off	When this label is on, it indicates that send or response receive on the PUBLISH command has been processed normally.
(16)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■CPU module

Target module	Firmware version	Engineering tool
FX5U, FX5UC	1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	1.040 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	828 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 2.40K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 1 point (Device number: Z9) • Long index register: 0 points When using an interrupt program, do not use the index register within the interrupt program.
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

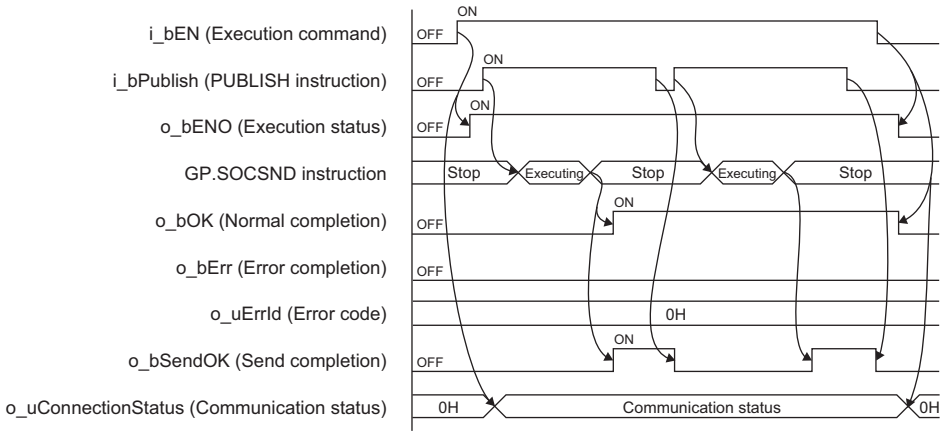
Processing

- After i_bEN (Execution command) turns on, the PUBLISH command is sent by turning on i_bPublish (PUBLISH instruction).
- If i_bPublish (PUBLISH instruction) turns on before the turning on of i_bEN (Execution command), the PUBLISH command is not sent.
- After i_bEN (Execution command) turns on, o_bOK (Normal completion) turns on when the first PUBLISH command is completed.
- When the PUBLISH command is completed, o_bSendOK (Send completion) turns on. When i_bPublish (PUBLISH instruction) turns off from on, o_bSendOK (Send completion) turns off.
- If an error occurs during the PUBLISH command execution, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108977) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

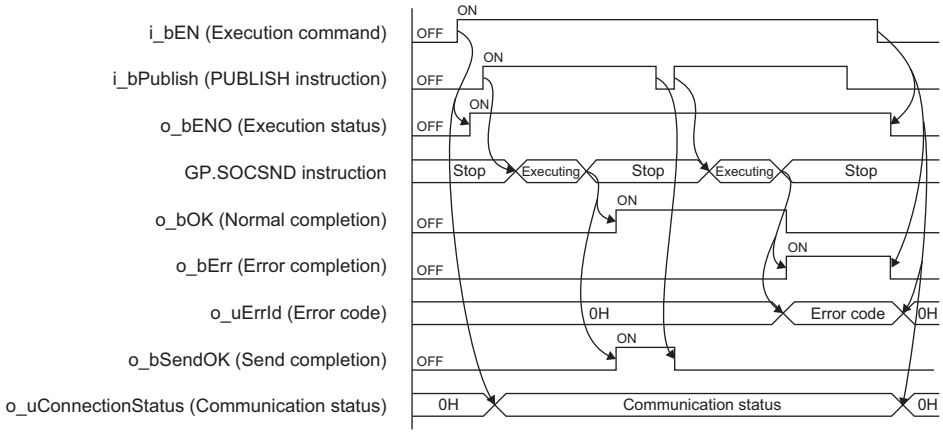
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instruction.

GP.SOCSND instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- When using more than one of this FB, do not concurrently turn on ibPublish (PUBLISH instruction) of the more than one FBs.
- Specify a NULL character at the end of each string.
- When K0 is specified for i_uPublishSendMessageSize (Publish message size) and i_uTopicMessageFormat (Topic/message format) is binary, the send message size is 0 bytes.
- When K0 is specified for i_uPublishSendMessageSize (Publish message size) and i_uTopicMessageFormat (Topic/message format) is ASCII, the maximum send message size is 32767 bytes.
- When K0 is specified for i_uPublishSendMessageSize (Publish message size) and i_uTopicMessageFormat (Topic/message format) is Unicode, the maximum send message size is 16383 words.
- To send a 32768 byte message with ASCII or Unicode specified for i_uTopicMessageFormat (Topic/message format), follow the conditions listed below.
  - Do not specify any NULL character at the end of Publish messages.
  - Specify K32768 for i_uPublishSendMessageSize (Publish message size).

- Do not concurrently execute this FB and any other Ethernet module dedicated instruction or any FB including an Ethernet module dedicated instruction. For example, do not concurrently turn on the GP.SOCSND instruction and i_bPublish (PUBLISH instruction) of this FB, or do not concurrently turn on i_bEN (Execution command) of M+FX5ENET_MQTT_Receive (Receiving of MQTT data) FB and i_bPublish (PUBLISH instruction) of this FB.

Parameter setting

For the parameter setting, refer to the following.

☞ Page 87 Parameter setting

Performance value

CPU module	Input label	Performance value		Number of scans
	Send size (byte)	Processing time	Maximum scan time	
FX5UJ*1	1	180.000ms	1.340ms	223 scans
	16384	181.000ms	43.800ms	260 scans
	32768	180.000ms	87.100ms	298 scans
FX5U, FX5UC*1*2*3	1	180.000ms	1.360ms	264 scans
	16384	183.000ms	41.400ms	316 scans
	32768	185.000ms	82.400ms	367 scans

*1 A personal computer in the same LAN is connected via a hub.
*2 When the program capacity is set to 128K steps, the processing speed may be reduced.
*3 The labels in the standard area are used.

Error code

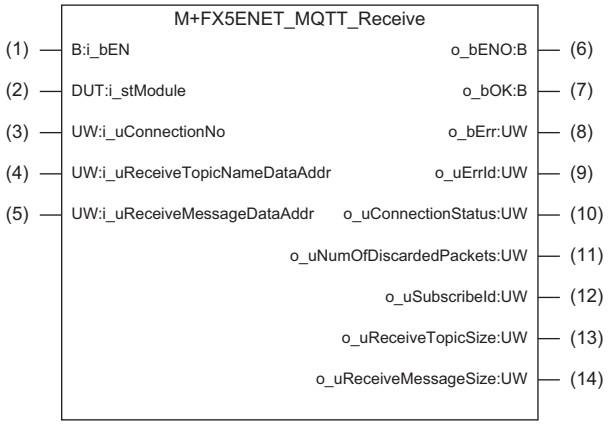
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
102H	The i_uQoS (QoS) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uTopicMessageFormat (Topic/message format) setting value is out of range.	After reviewing the setting, re-execute the FB.
105H	The i_uPublishTopicNameDataAdd (Publish topic name data start address) topic name is not set.	After setting the topic name with one or more characters, re-execute the FB.
130H	The i_uPublishMessageSize (Publish message size) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
210H	There is an overlapping part in the following two areas. Otherwise, the range of file register areas is exceeded. • Publish topic data area • Publish message data area	Set the following two areas so that no overlap occurs. • Publish topic data area • Publish message data area*2 After reviewing the setting, re-execute the FB.
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual
Socket communication error code	Same as the error code caused by the connection establishment (GP.SOCRCV) instruction	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.
*2 When the i_uPublishMessageSize (Publish message size) is set to 0, this area is treated as the area of 32768 bytes.

2.14 M+FX5ENET_MQTT_Receive (Receiving of MQTT data)

Overview

This FB reads a message received from an MQTT broker (server).



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_uReceiveTopicNameDataAddr	Receive topic name data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which to store the receive topic. ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end) ASCII/UTF-16 string
(5)	i_uReceiveMessageDataAddr	Receive message data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which to store the receive message content. ■Maximum number • For binary: 32768 bytes • For ASCII: 32767 characters (excluding NULL at the end) • For Unicode: 16383 characters (excluding NULL at the end) ASCII/UTF-16 string

Output label

No.	Variable name	Name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(7)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(8)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(9)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(10)	o_uConnectionStatus	Communication status	Word [Unsigned]/ Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual
(11)	o_uNumOfDiscardedPackets	Number of discarded packets	Word [Unsigned]/ Bit String [16-bit]	0	Stores the number of discarded packets.
(12)	o_uSubscribeId	Subscribe ID	Word [Unsigned]/ Bit String [16-bit]	0	Stores the ID associated with the topic filter specified during Subscribe.
(13)	o_uReceiveTopicSize	Receive topic size	Word [Unsigned]/ Bit String [16-bit]	0	Stores the receive topic size.
(14)	o_uReceiveMessageSize	Receive message size	Word [Unsigned]/ Bit String [16-bit]	0	Stores the receive message size.

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■CPU module

Target module	Firmware version	Engineering tool
FX5U, FX5UC	1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	1.040 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	604 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 2.40K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 1 point (Device number: Z9) • Long index register: 0 points When using an interrupt program, do not use the index register within the interrupt program.
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

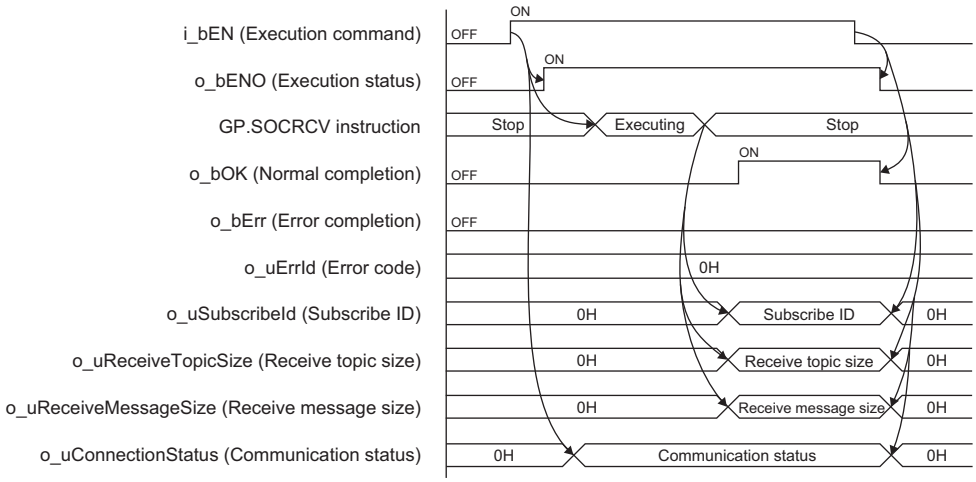
Processing

- After i_bEN (Execution command) turns on, this FB reads the data being received to the connection specified by the input argument.
- After the data receive is completed, o_bOK (Normal completion) turns on.
- If an error occurs during data receive, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108981) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

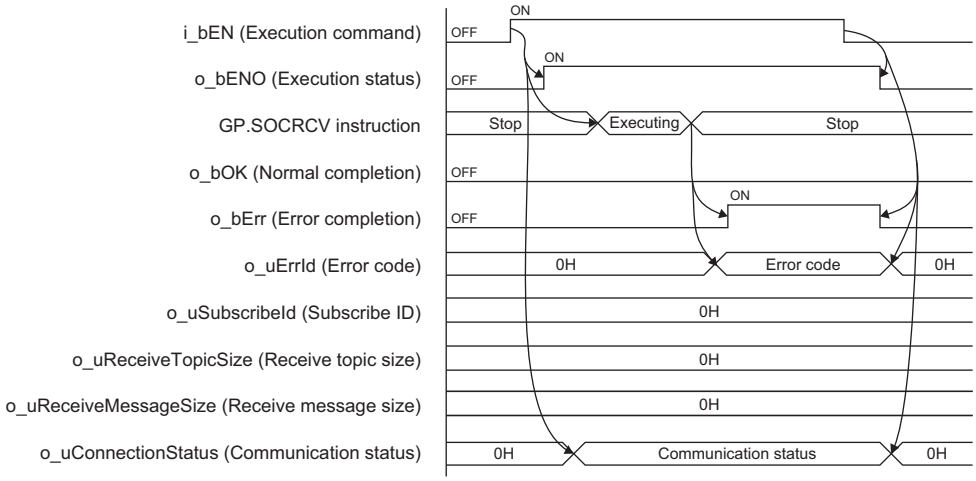
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instruction.

GP. SOCRCV instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- When using more than one of this FB, do not concurrently turn on i_bEN (Execution command) of the more than one FBs.
- Do not concurrently execute this FB and any other Ethernet module dedicated instruction or any FB including an Ethernet module dedicated instruction. For example, do not concurrently turn on the GP.SOCSND instruction and i_bEN (Execution command) of this FB, or do not concurrently turn on i_bPublish (PUBLISH instruction) of M+FX5ENET_MQTT_PublishSend (Sending of MQTT data) FB and i_bEN (Execution command) of this FB.

Parameter setting

For the parameter setting, refer to the following.

☞ Page 87 Parameter setting

Performance value

CPU module	Input label	Performance value		Number of scans
	Receive size (byte)	Processing time	Maximum scan time	
FX5UJ*1	1	2.000ms	2.310ms	5 scans
	16384	35.100ms	1.890ms	46 scans
	32768	69.100ms	1.960ms	89 scans
FX5U, FX5UC*1*2*3	1	2.000ms	1.190ms	5 scans
	16384	31.400ms	1.640ms	50 scans
	32768	60.600ms	1.630ms	94 scans

*1 A personal computer in the same LAN is connected via a hub.
*2 When the program capacity is set to 128K steps, the processing speed may be reduced.
*3 The labels in the standard area are used.

Error code

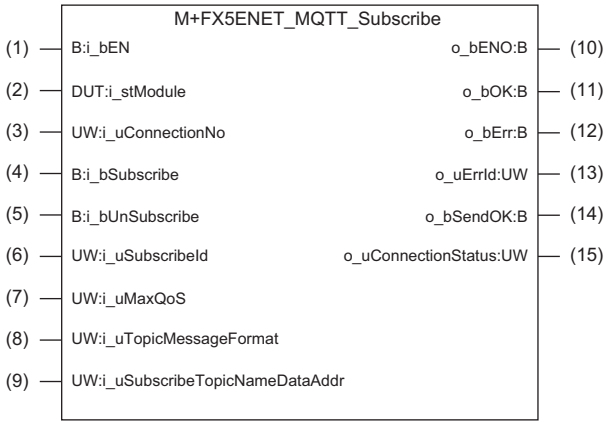
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
210H	There is an overlapping part in the following two areas. Otherwise, the range of file register areas is exceeded. • Receive topic name data area • Receive message data area	Set the following two areas so that no overlap occurs. • Receive topic name data area • Receive message data area After reviewing the setting, re-execute the FB.
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual
Socket communication error code	Same as the error code caused by the connection establishment (GP.SOCRCV) instruction	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.15 M+FX5ENET_MQTT_Subscribe (Sending of Subscribe command)

Overview

This FB sends a SUBSCRIBE/UNSUBSCRIBE command to an MQTT broker (server).



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_bSubscribe	SUBSCRIBE instruction*1	Bit	On, off	When On (rise) is detected, this FB sends the SUBSCRIBE command of the specified topic.
(5)	i_bUnSubscribe	UNSUBSCRIBE instruction	Bit	On, off	When On (rise) is detected, this FB sends the UNSUBSCRIBE command of the specified topic.
(6)	i_uSubscribeId	Subscribe ID	Word [Unsigned]/ Bit String [16-bit]	0 to 255	In the range of 1 to 255, specify ID1*2 to be associated with the topic to be subscribed to. When 0 is specified, no ID association is performed. This input label is valid only for the SUBSCRIBE instruction. The setting value is ignored for the UNSUBSCRIBE instruction. If a subscribe ID that has been already set is specified again for another topic, an error completion occurs.
(7)	i_uMaxQoS	Maximum QoS	Word [Unsigned]/ Bit String [16-bit]	0 to 2	Specify the maximum QoS level at message receive on SUBSCRIBE. The actual QoS level varies depending on the broker specifications. This input label is valid only for the SUBSCRIBE instruction. The setting value is ignored for the UNSUBSCRIBE instruction.

No.	Variable name	Name	Data type	Range	Description
(8)	i_uTopicMessageFormat	Topic/message format (Binary/ ASCII/Unicode string[*3] specification)	Word [Unsigned]/ Bit String [16-bit]	0 to 3	Specify the character code to be input in the send topic data start address (i_uSendTopicDataAddr) of FB: MQTT_Subscribe. Also, specify the data type and character code to be output with the receive topic data start address (o_uReceiveTopicDataAddr)/receive message data start address (i_uReceiveMessageDataAddr) of FB: MQTT_Receive. • 0: ASCII is used for topic/message. • 1: The Unicode string[*3] is used for topic/message. • 2: ASCII is used for topic and binary is used for message. • 3: The Unicode string[*3] is used for topic and binary is used for message. (Default: 0) Even when messages whose format differs between binary and string depending on the topic filter, those messages are converted and output as the received messages in accordance with this setting.
(9)	i_uSubscribeTopicName DataAddr	Subscribe topic name data start address	ASCII/Unicode string[*3]	—	Specify the start address of the file register (R) in which topic executing SUBSCRIBE or UNSUBSCRIBE (topic filter) is stored. ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end) If SUBSCRIBE is specified again for the topic for which SUBSCRIBE has been already set with another subscribe ID, error completion occurs. If UNSUBSCRIBE is specified for a topic for which SUBSCRIBE is not set, normal completion occurs without any action.

*1 The normal MQTT executes Subscribe only for the first time for each topic.
For how to receive data after Subscribe is executed, refer to the following.
☞ Page 349 M+FX5ENET_MQTT_Receive (Receiving of MQTT data)

*2 While the normal MQTT uses topics to distinguish the receive data, this label uses subscribe IDs (numbers) in the replacement of the topics.
For example, when the topic of test/abc1 is replaced with the subscribe ID 1 and the topic of test/bcd2 is replaced with the subscribe ID 2, those numbers are output at MQTT_Receive. Therefore, the topic can be determined from the ID.

*3 For GX Works3, the Unicode string is UTF-16.

Output label

No.	Variable name	Name	Data type	Default value	Description
(10)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(11)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(12)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(13)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(14)	o_bSendOK	Send completion	Bit	Off	When this label is on, it indicates that Subscribe/ Unsubscribe has been completed normally.
(15)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■CPU module

Target module	Firmware version	Engineering tool
FX5U, FX5UC	1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	1.040 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	500 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 1.90K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 1 point (Device number: Z9) • Long index register: 0 points When using an interrupt program, do not use the index register within the interrupt program.
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

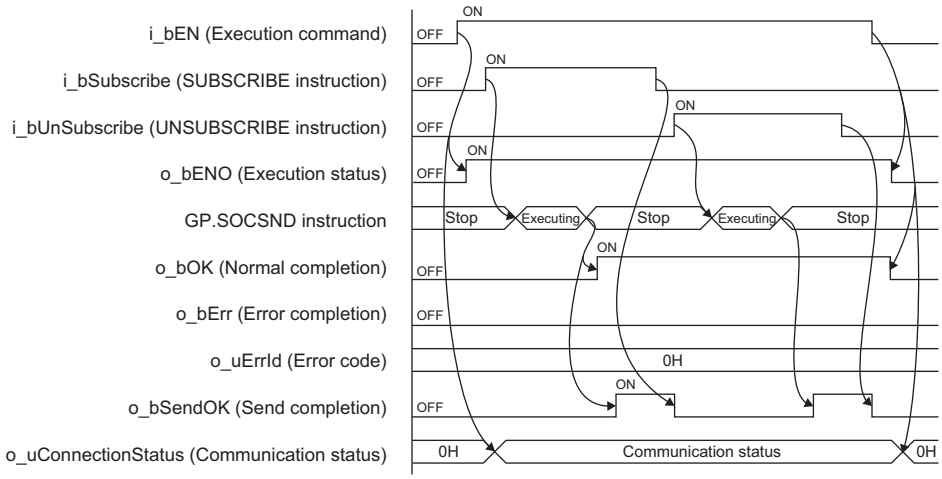
Processing

- After i_bEN (Execution command) turns on, the SUBSCRIBE command is sent to an MQTT broker (server) by turning on i_bSubscribe (SUBSCRIBE instruction) and the UNSUBSCRIBE command is sent by turning on (rising) i_bUnSubscribe (UNSUBSCRIBE instruction).
- After i_bEN (Execution command) turns on, o_bOK (Normal completion) turns on when the first SUBSCRIBE/UNSUBSCRIBE is completed.
- When the SUBSCRIBE/UNSUBSCRIBE is completed, o_bSendOK (Send completion) turns on. When i_bSubscribe (SUBSCRIBE instruction) or i_bUnSubscribe (UNSUBSCRIBE instruction) turns off from on, o_bSendOK (Send completion) turns off.
- If an error occurs during the SUBSCRIBE/UNSUBSCRIBE execution, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108979) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

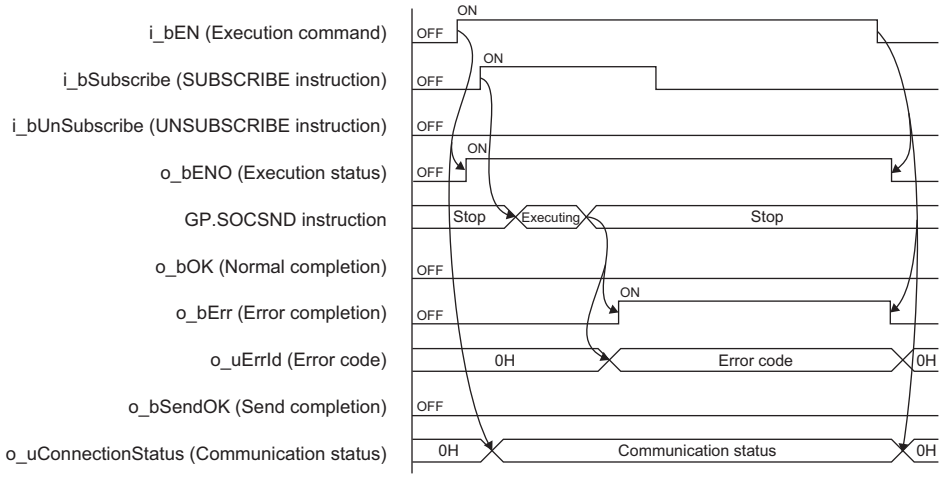
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instruction.

GP.SOCSND instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- Do not concurrently turn on i_bSubscribe (SUBSCRIBE instruction) and i_bUnSubscribe (UNSUBSCRIBE instruction).
- When using more than one of this FB, do not concurrently turn on i_bSubscribe (SUBSCRIBE instruction) or i_bUnSubscribe (UNSUBSCRIBE instruction) of the more than one FBs.
- Do not concurrently execute this FB and any other Ethernet module dedicated instruction or any FB including an Ethernet module dedicated instruction. For example, do not concurrently turn on the GP.SOCSND instruction and i_bSubscribe (SUBSCRIBE instruction) or i_bUnSubscribe (UNSUBSCRIBE instruction) of this FB, or do not concurrently turn on i_bEN (Execution command) of M+FX5ENET_MQTT_Receive (Receiving of MQTT data) FB and i_bSubscribe (SUBSCRIBE instruction) or i_bUnSubscribe (UNSUBSCRIBE instruction) of this FB.

Parameter setting

For the parameter setting, refer to the following.

☞ Page 87 Parameter setting

Performance value

CPU module	Input label	Performance value		Number of scans
	Command	Processing time	Maximum scan time	
FX5UJ*1	SUBSCRIBE instruction	186.000ms	1.360ms	243 scans
	UNSUBSCRIBE instruction	187.000ms	1.900ms	245 scans
FX5U, FX5UC*1*2*3	SUBSCRIBE instruction	185.000ms	1.340ms	287 scans
	UNSUBSCRIBE instruction	186.000ms	1.210ms	288 scans

*1 A personal computer in the same LAN is connected via a hub.
*2 When the program capacity is set to 128K steps, the processing speed may be reduced.
*3 The labels in the standard area are used.

Error code

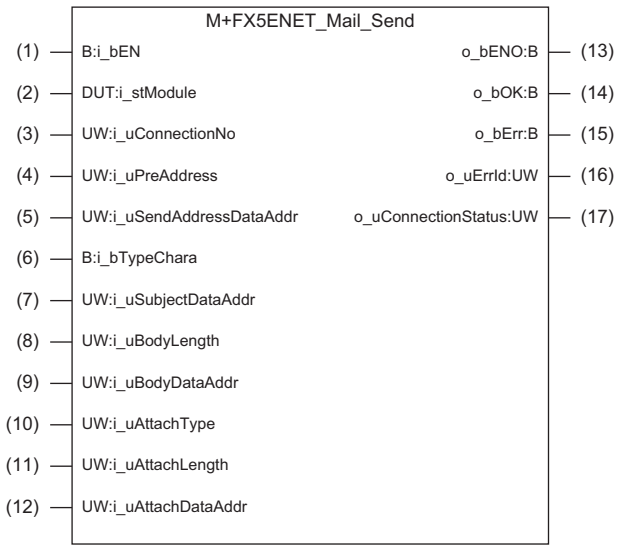
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	Contention has occurred between i_bSubscribe (SUBSCRIBE instruction) and i_bUnSubscribe (UNSUBSCRIBE instruction).	Review the timing of instructions so that they do not cause contention.
102H	The i_uMaxQoS (Maximum QoS) setting value is out of range.	After reviewing the setting, re-execute the FB.
103H	The i_uTimeout (Timeout value) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uTopicMessageFormat (Topic/message format) setting value is out of range.	After reviewing the setting, re-execute the FB.
105H	The i_uSubscribeTopicNameDataAddr (Subscribe topic data start address) topic name is not set.	After setting the topic name with one or more characters, re-execute the FB.
150H	The i_uSubscribeId (Subscribe ID) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.16 M+FX5ENET_Mail_Send (Sending of E-mail)

Overview

This FB establishes a TLS/TCP session with an SMTP server. Then, it sends E-mail data.
After sending the E-mail, it disconnects the TLS/TCP session.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_uPreAddress	Preset send address instruction	Word [Unsigned]/ Bit String [16-bit]	0000H to 03FFH	When the send destination E-mail addresses whose parameters are set with GXW3 are specified, the corresponding bits turn on. • b0: Send destination E-mail address No.1 • b1: Send destination E-mail address No.2 ⋮ • b9: Send destination E-mail address No.10
(5)	i_uSendAddressDataAddr	Send destination address data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which to store the send destination E-mail address within 256 characters.*2 Multiple E-mail addresses (10 or more is also possible.) can be specified in the comma-delimited format. Also, this label can be concurrently used with the preset send address instruction. Set the end of string to NULL because it is used for size determination. If the number of characters reaches the maximum length, secure the space of 257 bytes because NULL is set at the position of the maximum length + 1 in the subject.
(6)	i_bTypeChara	ASCII/UTF-16 string specification	Bit	On, off	On: ASCII is used for subject/message body. Off: UTF-16 is used for subject/message body.
(7)	i_uSubjectDataAddr	Subject data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which to store the subject. The maximum number of characters varies depending on the setting value of the ASCII/UTF-16 string specification.*3 ■Maximum number of characters • For ASCII: 128 bytes/128 characters • For Unicode: 128 bytes/64 characters Set the end of string to NULL because it is used for size determination. If the number of characters reaches the maximum length, secure the space of 65 words (130 bytes) because NULL is set at the position of the maximum length + 1 in the subject.
(8)	i_uBodyLength	Number of message body characters	Word [Unsigned]/ Bit String [16-bit]	0 to 1024, 0 to 512	Specify the number of message body data characters. • When ASCII is used: 0 to 1024 characters • When UTF-16 is used: 0 to 512 characters When 0 is specified, the number of message body characters is automatically set.*1
(9)	i_uBodyDataAddr	Message body data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which to store the message body. When the number of the message body characters is 0, set the end of string to NULL because it is used for size determination. If the number of characters reaches the maximum length, secure the space of 513 words (1026 bytes) because NULL is set at the position of the maximum length + 1 in the subject.
(10)	i_uAttachType	Attachment format	Word [Unsigned]/ Bit String [16-bit]	0 to 3	Specify the presence/absence of an attachment and the file format. • 0: No attachment • 1: CSV format • 2: BIN format • 3: ASCII format

No.	Variable name	Name	Data type	Range	Description
(11)	i_uAttachLength	Attachment size	Word [Unsigned]/ Bit String [16-bit]	0 to 16384	Specify the attachment size (number of words). When the format is 0 (no attachment), this item is not used.
(12)	i_uAttachDataAddr	Attachment data start address	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start address of the file register (R) in which the attachment (maximum 32768 bytes) data is stored.

*1 The data area for number of message body characters is treated as 1024 bytes (excluding NULL).
*2 The send destination address data area is treated as 256 bytes (excluding NULL).
*3 The subject data area is treated as 128 bytes (excluding NULL).

Output label

No.	Variable name	Name	Data type	Default value	Description
(13)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(14)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(15)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(16)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(17)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■CPU module

Target module	Firmware version	Engineering tool
FX5U, FX5UC	1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	1.040 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	1081 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 2.41K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 1 point (Device number: Z9) • Long index register: 0 points When using an interrupt program, do not use the index register within the interrupt program.
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

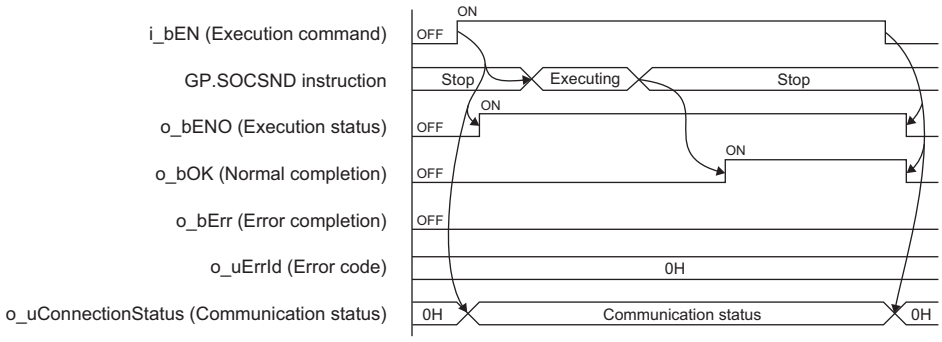
Processing

- After i_bEN (Execution command) turns on, this FB sends the E-mail send command.
- When the E-mail send command is completed, this FB turns on o_bOK (Normal completion) or turns on o_bErr (Error completion) and stores the error code in o_uErrId (Error code).
- When i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G4380) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

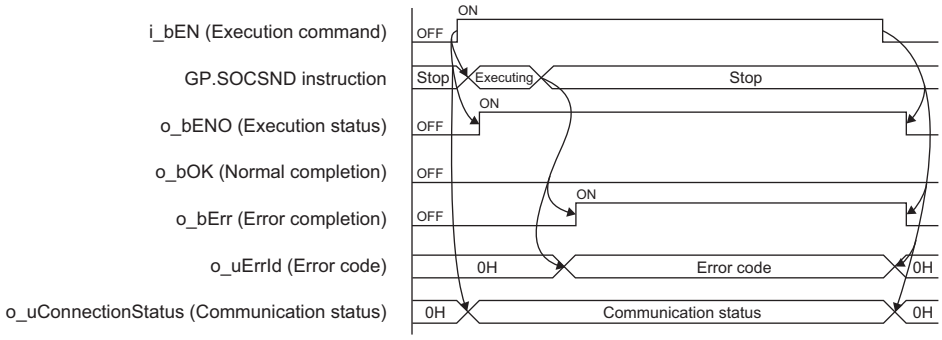
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

GP.OPEN instruction
GP.SOCSND instruction
GP.CLOSE instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- When using more than one of this FB, do not concurrently turn on i_bEN (Execution command) of the more than one FBs.
- When K0 is specified for i_uBodyLength (Number of message body characters) and i_bTypeChara (ASCII/UTF-16 string specification) is ASCII, the maximum send message size is 1023 bytes.
- When K0 is specified for i_uBodyLength (Number of message body characters) and i_bTypeChara (ASCII/UTF-16 string specification) is Unicode, the maximum send message size is 511 words.
- To send the maximum size of message body data, follow the conditions listed below.
  - Do not specify any NULL character at the end of message body data.
  - When i_bTypeChara (ASCII/UTF-16 string specification) is ASCII, specify K1024 for i_uBodyLength (Number of message body characters).
  - When i_bTypeChara (ASCII/UTF-16 string specification) is Unicode, specify K512 for i_uBodyLength (Number of message body characters).
- Do not concurrently execute this FB and any other Ethernet module dedicated instruction or any FB including an Ethernet module dedicated instruction. For example, do not concurrently turn on the GP.SOCSND instruction and i_bEN (Execution command) of this FB, or do not concurrently turn on i_bPublish (PUBLISH instruction) of M+FX5ENET_MQTT_PublishSend (Sending of MQTT data) FB and i_bEN (Execution command) of this FB.

Parameter setting

Set the target device connection configuration for E-mail send by using GX Works3.

Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-ENET] ⇨ [Basic Settings] ⇨ [External Device Configuration]

In the target device connection configuration setting, set the protocol to the TLS connection or TCP connection. Set the certificate by using Certificate Configuration Tool for FX5-ENET. For details on the setting method, refer to the following.

MELSEC iQ-F FX5 Ethernet Module User's Manual

Performance value

CPU module	Input label	Performance value		Number of scans
	Send size (byte)	Processing time	Maximum scan time	
FX5UJ*1	1	5170.000ms	0.946ms	10173 scans
	16384	6330.000ms	2.400ms	13251 scans
	32768	6790.000ms	2.570ms	16079 scans
FX5U, FX5UC*1*2*3	1	3750.000ms	0.829ms	11117 scans
	16384	5480.000ms	1.710ms	15823 scans
	32768	6790.000ms	2.030ms	19185 scans

*1 Connect with a free mail service.
*2 When the program capacity is set to 128K steps, the processing speed may be reduced.
*3 The labels in the standard area are used.

Error code

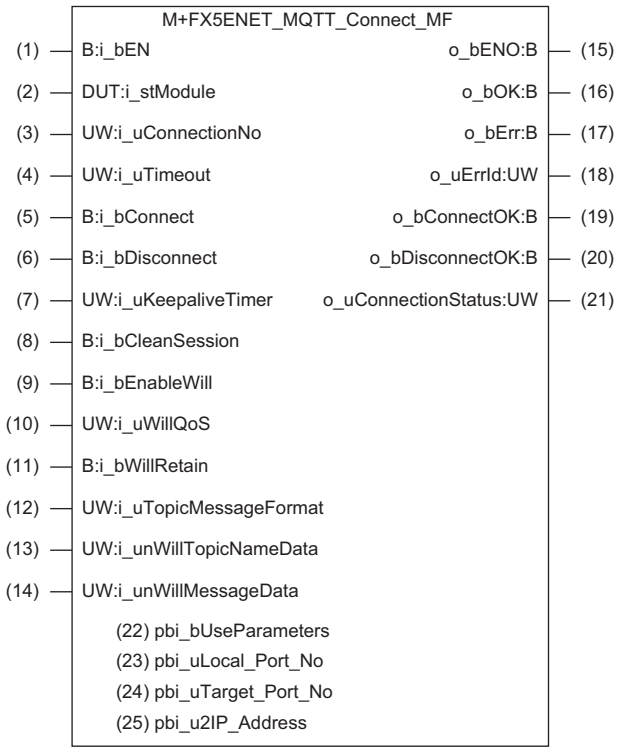
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	The i_uPreAddress (Preset send address instruction) setting value is out of range.	After reviewing the setting, re-execute the FB.
102H	The i_uBodyLength (Number of message body characters) setting value is out of range.	After reviewing the setting, re-execute the FB.
103H	The i_uAttachType (Attachment format) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uAttachLength (Attachment size) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
210H	There is an overlapping part in the following four areas. Otherwise, the range of file register areas is exceeded. • Send destination address data area • Subject data area • Message body data area • Attachment data area	Set the following four areas so that no overlap occurs. • Send destination address data area • Subject data area • Message body data area • Attachment data area After reviewing the setting, re-execute the FB.
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.17 M+FX5ENET_MQTT_Connect_MF (MQTT connection establishment)

Overview

This FB controls the connection with an MQTT broker (server) to establish a TCP or TLS session on the CONNECT instruction or to disconnect the session on the DISCONNECT instruction.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_uTimeout	Timeout setting	Word [Unsigned]/Bit String [16-bit]	1 to 65535	Specify the connection timeout (s).
(5)	i_bConnect	CONNECT instruction	Bit	On, off	Turn on this label when establishing a TCP or TLS session.
(6)	i_bDisconnect	DISCONNECT instruction	Bit	On, off	Turn on this label when disconnecting a TCP or TLS session.
(7)	i_uKeepaliveTimer	keepalive timer	Word [Unsigned]/Bit String [16-bit]	0 to 65535	Specify the KeepAlive timer (s) to an MQTT broker.
(8)	i_bCleanSession	Clean session setting	Bit	On, off	Select the operation to be performed when a session already exists at CONNECT.
(9)	i_bEnableWill	Enable Will	Bit	On, off	On: Will is enabled. Off: Will is disabled.
(10)	i_uWillQoS	Will QoS	Word [Unsigned]/Bit String [16-bit]	0 to 2	Specify the QoS to be used for sending Will.
(11)	i_bWillRetain	Will Retain	Bit	On, off	Specify the Retain flag of Will messages.
(12)	i_uTopicMessageFormat	Will topic/message format (ASCII/Unicode string*1 specification)	Word [Unsigned]/Bit String [16-bit]	0 to 1	Specify the character code of Will topic/message.*2 • 0: ASCII is used for Will topic/message. • 1: The Unicode string*1 is used for Will topic/message.
(13)	i_unWillTopicNameData	Will topic name data	Word [Unsigned]/Bit String [16-bit]	—	Specify the start element of the array label in which the Will message topic name is stored.*3 ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end)
(14)	i_unWillMessageData	Will message data	Word [Unsigned]/Bit String [16-bit]	—	Specify the start element of the array label in which the Will message content is stored.*4 ■Maximum number of characters • For ASCII: 500 characters (excluding NULL at the end) • For Unicode: 250 characters (excluding NULL at the end)

*1 For GX Works3, the Unicode string is UTF-16.

*2 The mixture of the ASCII code and Unicode strings cannot be specified.

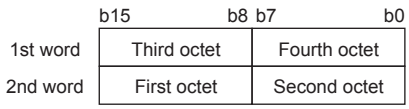
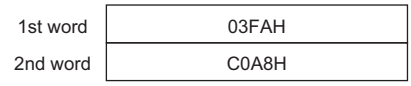
*3 The Will topic name data area is treated as 511 bytes (excluding NULL). Therefore, set the number of elements in the array label to 256. If the number of elements in the array label is insufficient, an undefined value may be included.

*4 The Will message data area is treated as 500 bytes (excluding NULL). Therefore, set the number of elements in the array label to 250. If the number of elements in the array label is insufficient, an undefined value may be included.

Output label

No.	Variable name	Name	Data type	Default value	Description
(15)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(16)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(17)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(18)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(19)	o_bConnectOK	Establishment completion	Bit	Off	When this label is on, it indicates that Connect has been processed normally.
(20)	o_bDisconnectOK	Disconnection completion	Bit	Off	When this label is on, it indicates that Disconnect has been processed normally.
(21)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

Public label

No.	Variable name	Name	Data type	Range	Description
(22)	pbi_bUseParameters	Parameter used	Bit	On, off	Specify whether to use the parameter values set by the engineering tool or the following operation parameter ((23) to (25)) values when processing for opening a connection. • Off: Performs open processing according to the target device configuration setting made by the engineering tool. (The following operation parameters ((23) to (25)) need not be set. Any settings are ignored if made.) • On: Performs open processing according to the following operation parameters ((23) to (25)).
(23)	pbi_uLocal_Port_No	Own node port number	Word [Unsigned]/Bit String [16-bit]	1 to 5548, 5570 to 65534	Specify the port number of the own node. Own node port numbers 1 to 1023 are generally reserved port numbers, and 61440 to 65534 are used by other communication functions. Therefore, port numbers 1024 to 5548 and 5570 to 61439 should be used.
(24)	pbi_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the destination port number.
(25)	pbi_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.255	Specify the IP address of the target device.  Example: When IP address is 192.168.3.250 

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■Controller

Target module	Firmware version	Engineering tool
MXF100	106 or later	GX Works3 Version 1.095Z or later

Basic specifications

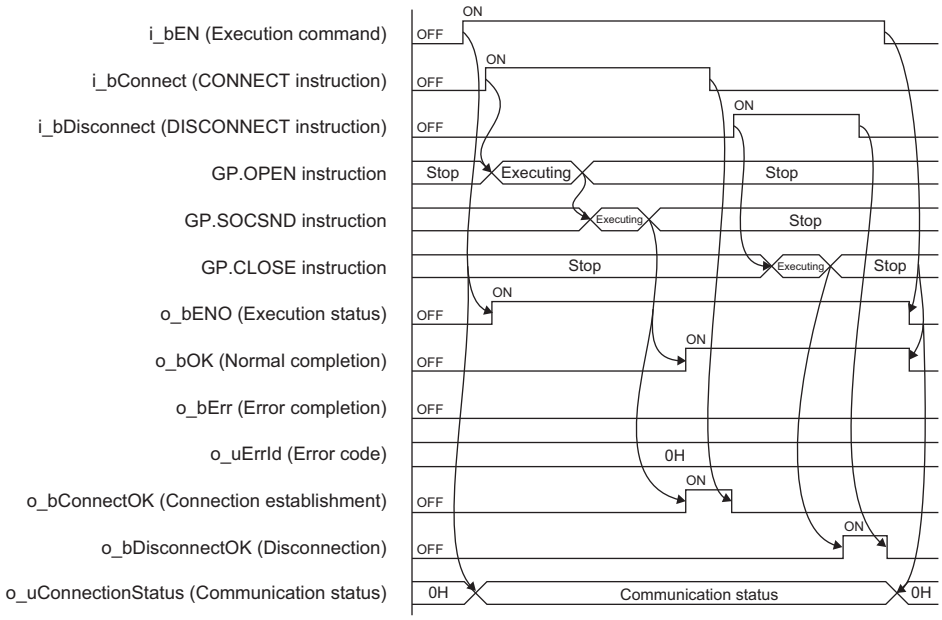
Item	Description
Number of steps	254 steps The number of steps of the FB embedded in the program varies depending on the controller used, the input/output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 0.33K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the controller used, the device specified in an argument and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

Processing

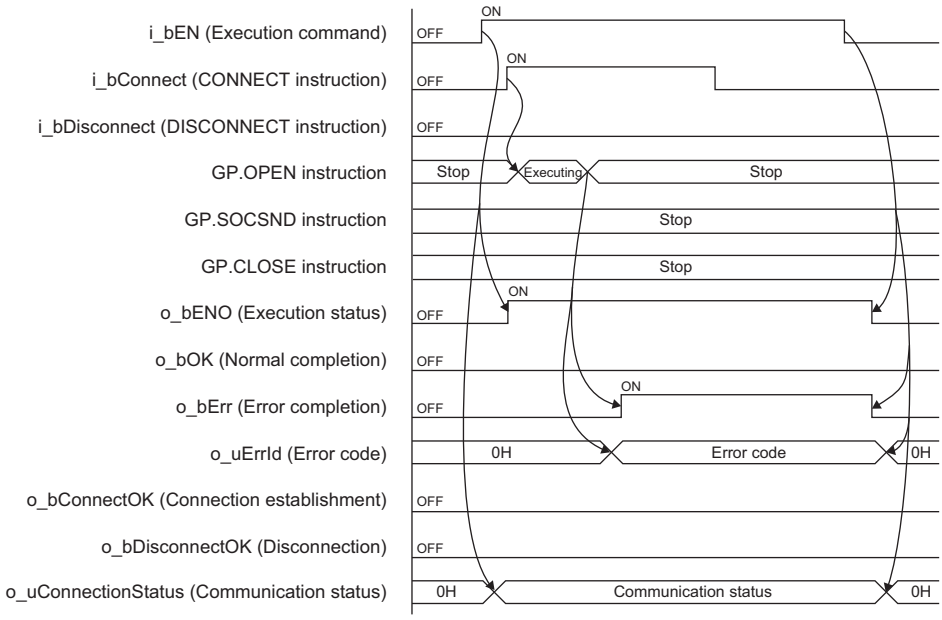
- After i_bEN (Execution command) turns on, a session is established by turning on i_bConnect (CONNECT instruction) and is disconnected by turning on i_bDisconnect (DISCONNECT instruction).
- After i_bEN (Execution command) turns on, o_bOK (Normal completion) turns on when the first session is completely established or disconnected.
- When the session is completely established, o_bConnectOK (Establishment completion) turns on. When i_bConnect (CONNECT instruction) turns off from on, o_bSendOK (Establishment completion) turns off.
- When the session is completely disconnected, o_bDisconnectOK (Disconnection completion) turns on. When i_bDisconnect (DISCONNECT instruction) turns off from on, o_bDisconnectOK (Disconnection completion) turns off.
- If an error occurs during establishment/disconnection of the session, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108975) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. (☞ Page 87 Parameter setting)

Timing chart of I/O signals

■For normal completion (Starting when i_bConnect or i_bDissconnect turns on)



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

GP.OPEN instruction
GP.SOCSND instruction
GP.CLOSE instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- The i_uKeepaliveTimer (keepalive timer) value does not always apply. Some connection target devices may be disconnected before the time set with i_uKeepaliveTimer (keepalive timer).
- Do not concurrently turn on i_bConnect (CONNECT instruction) and i_bDisconnect (DISCONNECT instruction).
- When using more than one of this FB, do not concurrently turn on i_bConnect (CONNECT instruction) or i_bDisconnect (DISCONNECT instruction) of the more than one FBs.
- If the number of elements in the array label specified in i_unWillTopicNameData (Will topic name data) or i_unWillMessageData (Will message data) is insufficient, an undefined value may be included.
- Specify the start element of the array label in i_unWillTopicNameData (Will topic name data) and i_unWillMessageData (Will message data).
- When TLS connection is specified to perform the CONNECT instruction while simple CPU communication is being performed, simple CPU communication may be performed with a delay of less than one second until the MQTT connection is established.

Parameter setting

Set the target device connection configuration on MQTT communication by using GX Works3.

Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-ENET] ⇨ [Basic Settings] ⇨ [External Device Configuration]

In the target device connection configuration setting, set the protocol to the TLS connection or TCP connection. Set the certificate by using Certificate Configuration Tool for FX5-ENET. For details on the setting method, refer to the following.
MELSEC iQ-F FX5 Ethernet Module User's Manual

Performance value

Controller	Input label	Performance value		Number of scans
	CONNECT/DISCONNECT	Processing time	Maximum scan time	
MXF100*1	CONNECT	34.600ms	0.542ms	21 scans
	DISCONNECT	8.090ms	0.543ms	4 scans

*1 A personal computer in the same LAN is connected via a hub.

Error code

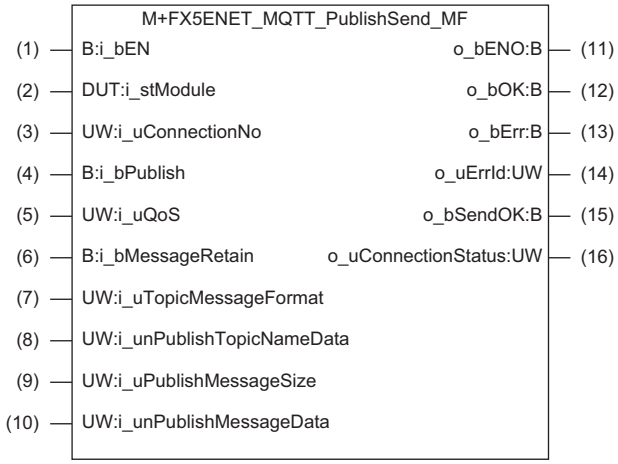
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	Contention has occurred between i_bConnect (CONNECT instruction) and i_bDisconnect (DISCONNECT instruction).	After reviewing the setting, re-execute the FB.
102H	The i_uWillQoS (WillQoS) setting value is out of range.	After reviewing the setting, re-execute the FB.
103H	The i_uTimeout (Timeout value) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uTopicMessageFormat (Will topic/message format) setting value is out of range.	After reviewing the setting, re-execute the FB.
120H	The i_uWillTopicNameDataAddr (Will topic name data start address) topic name is not set.	After setting the topic name with one or more characters, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.18 M+FX5ENET_MQTT_PublishSend_MF (Sending of MQTT data)

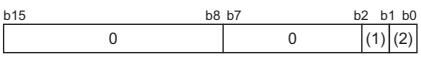
Overview

This FB sends a message to an MQTT broker (server).



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_bPublish	PUBLISH instruction (Rise detection)	Bit	On, off	Sends data on the PUBLISH command.
(5)	i_uQoS	QoS	Word [Unsigned]/ Bit String [16-bit]	0 to 2	Specify the QoS level to be used for send.
(6)	i_bMessageRetain	Retain send message	Bit	On, off	Specify the Retain flag of the PUBLISH command.
(7)	i_uTopicMessageFormat	Topic/message format*1 specification	Word [Unsigned]/ Bit String [16-bit]	0 to 3	Specify the character code of topic/message. • 0 (b1 = 0, b0 = 0): ASCII is used for topic/message. • 1 (b1 = 0, b0 = 1): The Unicode string*1 is used for topic/message. • 2 (b1 = 1, b0 = 0): ASCII is used for topic and binary is used for message. • 3 (b1 = 1, b0 = 1): The Unicode string*1 is used for topic and binary is used for message.  • (1): Binary is specified for message. • (2): ASCII/UTF-16 is specified for topic/message.

No.	Variable name	Name	Data type	Range	Description
(8)	i_unPublishTopicNameData	Publish topic name data	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start element of the array label in which the send message topic name is stored.*4 ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end) ASCII/Unicode string*1
(9)	i_uPublishSendMessageSize	Publish message size	Word [Unsigned]/ Bit String [16-bit]	0 to 32768	Specify the send message size. When 0 is specified, the send message size is automatically set.*2*3 If the number of characters reaches the maximum length, manually set NULL at the position of the maximum length + 1 in the send message. Therefore, secure a space of 32768 bytes.
(10)	i_unPublishMessageData	Publish message data	Word [Unsigned]/ Bit String [16-bit]	—	Specify the start element of the array label in which the send message content is stored. Binary/ASCII/Unicode string*1

*1 For GX Works3, the Unicode string is UTF-16.

*2 The Publish message data area is treated as 32768 bytes (including NULL). Therefore, set the number of elements of the array label according to the Publish message size. If 0 is specified for the Publish message size, the area is treated as the maximum length + 1 byte. Therefore, set the number of elements of the array label to 16384.

*3 When i_uTopicMessageFormat (Topic/message format) is binary, this area is treated as 0 byte data.

*4 The Publish topic name data area is treated as 511 bytes (excluding NULL). Therefore, set the number of elements of the array label to 256. If the number of elements in the array label is insufficient, an undefined value may be included.

Output label

No.	Variable name	Name	Data type	Default value	Description
(11)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(12)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(13)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(14)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(15)	o_bSendOK	Send completion	Bit	Off	When this label is on, it indicates that send or response receive on the PUBLISH command has been processed normally.
(16)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■Controller

Target module	Firmware version	Engineering tool
MXF100	106 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	226 steps The number of steps of the FB embedded in the program varies depending on the controller used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 1.05K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the controller used, the device specified in an argument and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

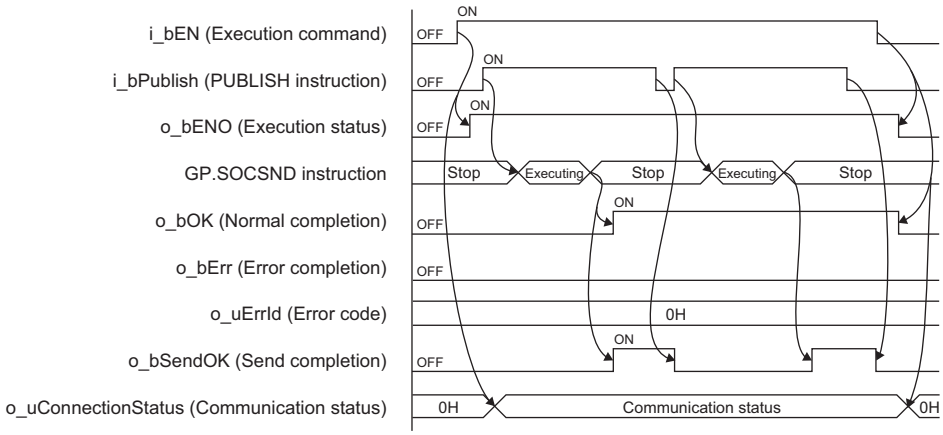
Processing

- After i_bEN (Execution command) turns on, the PUBLISH command is sent by turning on i_bPublish (PUBLISH instruction).
- If i_bPublish (PUBLISH instruction) turns on before the turning on of i_bEN (Execution command), the PUBLISH command is not sent.
- After i_bEN (Execution command) turns on, o_bOK (Normal completion) turns on when the first PUBLISH command is completed.
- When the PUBLISH command is completed, o_bSendOK (Send completion) turns on. When i_bPublish (PUBLISH instruction) turns off from on, o_bSendOK (Send completion) turns off.
- If an error occurs during the PUBLISH command execution, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108977) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

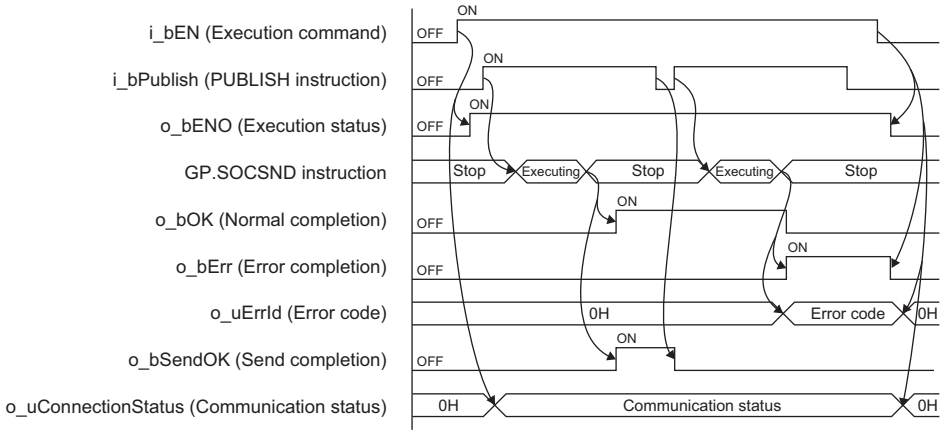
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instruction.

GP.SOCSND instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- When using more than one of this FB, do not concurrently turn on ibPublish (PUBLISH instruction) of the more than one FBs.
- Specify a NULL character at the end of each string.
- When K0 is specified for i_uPublishSendMessageSize (Publish message size) and i_uTopicMessageFormat (Topic/message format) is binary, the send message size is 0 bytes.
- When K0 is specified for i_uPublishSendMessageSize (Publish message size) and i_uTopicMessageFormat (Topic/message format) is ASCII, the maximum send message size is 32767 bytes.
- When K0 is specified for i_uPublishSendMessageSize (Publish message size) and i_uTopicMessageFormat (Topic/message format) is Unicode, the maximum send message size is 16383 words.
- To send a 32768 byte message with ASCII or Unicode specified for i_uTopicMessageFormat (Topic/message format), follow the conditions listed below.
  - Do not specify any NULL character at the end of Publish messages.
  - Specify K32768 for i_uPublishSendMessageSize (Publish message size).
- If the number of elements in the array label specified in i_unPublishTopicNameData (Publish topic name data) or i_unPublishSendMessageData (Publish message data) is insufficient, an undefined value may be included.
- Specify the start element of the array label in i_unPublishTopicNameData (Publish topic name data) and i_unPublishSendMessageData (Publish message data).

Parameter setting

For the parameter setting, refer to the following.

☞ Page 87 Parameter setting

Performance value

Controller	Input label	Performance value		Number of scans
	Send size (byte)	Processing time	Maximum scan time	
MXF100*1	1	6.450ms	0.718ms	15 scans
	16384	39.200ms	1.260ms	100 scans
	32768	69.200ms	1.310ms	184 scans

*1 A personal computer in the same LAN is connected via a hub.

Error code

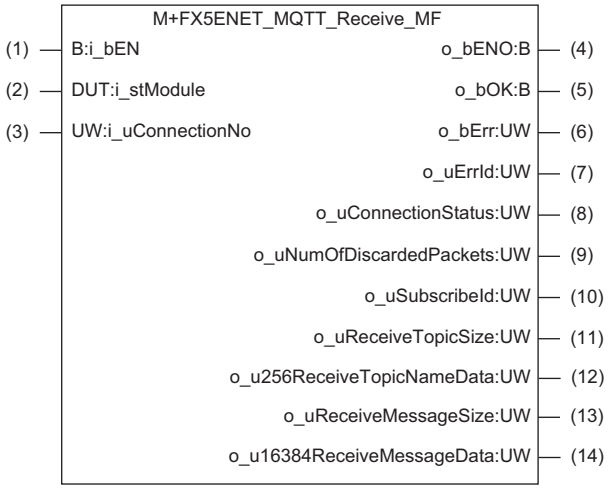
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
102H	The i_uQoS (QoS) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uTopicMessageFormat (Topic/message format) setting value is out of range.	After reviewing the setting, re-execute the FB.
105H	The i_uPublishTopicNameDataAdd (Publish topic name data start address) topic name is not set.	After setting the topic name with one or more characters, re-execute the FB.
130H	The i_uPublishMessageSize (Publish message size) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual
Socket communication error code	Same as the error code caused by the connection establishment (GP.SOCRCV) instruction	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.19 M+FX5ENET_MQTT_Receive_MF (Receiving of MQTT data)

Overview

This FB reads a message received from an MQTT broker (server).



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(8)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual
(9)	o_uNumOfDiscardedPackets	Number of discarded packets	Word [Unsigned]/Bit String [16-bit]	0	Stores the number of discarded packets.
(10)	o_uSubscribeId	Subscribe ID	Word [Unsigned]/Bit String [16-bit]	0	Stores the ID associated with the topic filter specified during Subscribe.
(11)	o_uReceiveTopicSize	Receive topic size	Word [Unsigned]/Bit String [16-bit]	0	Stores the receive topic size.
(12)	o_u256ReceiveTopicNameData	Receive topic name data storage destination	Word [Unsigned]/Bit String [16-bit] (0..255)	—	Specify the array label in which to store the receive topic.*1 ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end) ASCII/UTF-16 string
(13)	o_uReceiveMessageSize	Receive message size	Word [Unsigned]/Bit String [16-bit]	0	Stores the receive message size.
(14)	o_u16384ReceiveMessageData	Receive message data storage destination	Word [Unsigned]/Bit String [16-bit] (0..16383)	—	Specify the array label in which to store the receive message content.*1 ■Maximum number of characters • For binary: 32768 bytes • For ASCII: 32767 characters (excluding NULL at the end) • For Unicode: 16383 characters (excluding NULL at the end) ASCII/UTF-16 string

*1 If a label other than an array label is specified, an undefined value may be included.

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■Controller

Target module	Firmware version	Engineering tool
MXF100	106 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	155 steps The number of steps of the FB embedded in the program varies depending on the controller used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 17.29K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the controller used, the device specified in an argument and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 0 points • Long index register: 0 points When using an interrupt program, do not use the index register within the interrupt program.
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

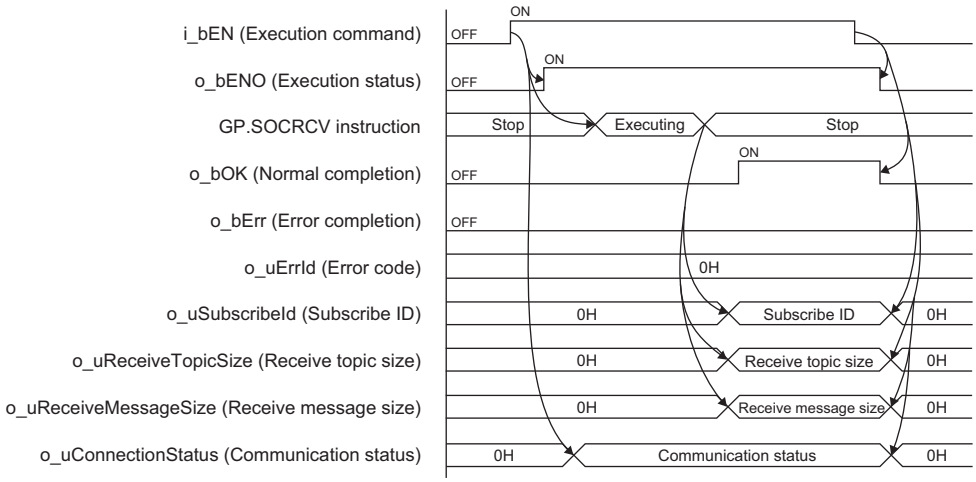
Processing

- After i_bEN (Execution command) turns on, this FB reads the data being received to the connection specified by the input argument.
- After the data receive is completed, o_bOK (Normal completion) turns on.
- If an error occurs during data receive, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108981) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

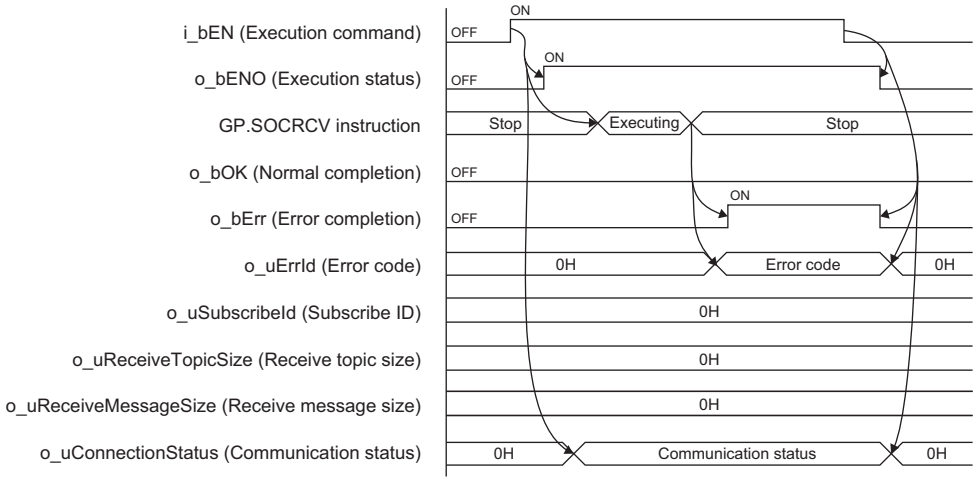
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instruction.

GP. SOCRCV instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- When using more than one of this FB, do not concurrently turn on i_bEN (Execution command) of the more than one FBs.
- If a label other than an array label is specified in o_u256ReceiveTopicNameData (Receive topic name data storage destination) or o_u16384ReceiveMessageData (Receive message data storage destination), an undefined value may be included.

Parameter setting

For the parameter setting, refer to the following.

☞ Page 87 Parameter setting

Performance value

Controller	Input label	Performance value		Number of scans
	Receive size (byte)	Processing time	Maximum scan time	
MXF100*1	1	3.850ms	0.756ms	8 scans
	16384	30.000ms	1.220ms	71 scans
	32768	56.000ms	1.2000ms	131 scans

*1 A personal computer in the same LAN is connected via a hub.

Error code

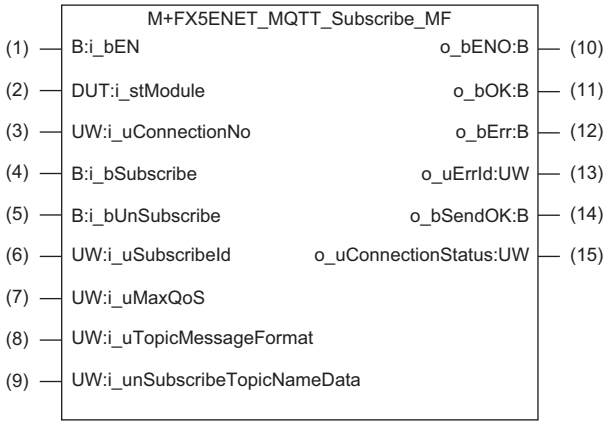
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual
Socket communication error code	Same as the error code caused by the connection establishment (GP.SOCRCV) instruction	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.20 M+FX5ENET_MQTT_Subscribe_MF (Sending of Subscribe command)

Overview

This FB sends a SUBSCRIBE/UNSUBSCRIBE command to an MQTT broker (server).



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_bSubscribe	SUBSCRIBE instruction	Bit	On, off	When On (rise) is detected, this FB sends the SUBSCRIBE command of the specified topic.
(5)	i_bUnSubscribe	UNSUBSCRIBE instruction	Bit	On, off	When On (rise) is detected, this FB sends the UNSUBSCRIBE command of the specified topic.
(6)	i_uSubscribeId	Subscribe ID	Word [Unsigned]/ Bit String [16-bit]	0 to 255	In the range of 1 to 255, specify ID1[*1] to be associated with the topic to be subscribed to. When 0 is specified, no ID association is performed. This input label is valid only for the SUBSCRIBE instruction. The setting value is ignored for the UNSUBSCRIBE instruction. If a subscribe ID that has been already set is specified again for another topic, an error completion occurs.
(7)	i_uMaxQoS	Maximum QoS	Word [Unsigned]/ Bit String [16-bit]	0 to 2	Specify the maximum QoS level at message receive on SUBSCRIBE. The actual QoS level varies depending on the broker specifications. This input label is valid only for the SUBSCRIBE instruction. The setting value is ignored for the UNSUBSCRIBE instruction.

No.	Variable name	Name	Data type	Range	Description
(8)	i_uTopicMessageFormat	Topic/message format (Binary/ ASCII/Unicode string[*3] specification)	Word [Unsigned]/ Bit String [16-bit]	0 to 3	Specify the character code to be input in the send topic data start address (i_uSendTopicDataAddr) of FB: MQTT_Subscribe. Also, specify the data type and character code to be output with the receive topic data start address (o_uReceiveTopicDataAddr)/receive message data start address (i_uReceiveMessageDataAddr) of FB: MQTT_Receive. • 0: ASCII is used for topic/message. • 1: The Unicode string[*3] is used for topic/message. • 2: ASCII is used for topic and binary is used for message. • 3: The Unicode string[*3] is used for topic and binary is used for message. (Default: 0) Even when messages whose format differs between binary and string depending on the topic filter, those messages are converted and output as the received messages in accordance with this setting.
(9)	i_unSubscribeTopicName Data	Subscribe topic name data	Word [Unsigned]/ Bit String [16-bit][*1]	—	Specify the start element of the array label in which the topic executing SUBSCRIBE or UNSUBSCRIBE (topic filter) is stored.[*2] ■Maximum number of characters • For ASCII: 511 characters (excluding NULL at the end) • For Unicode: 255 characters (excluding NULL at the end) ASCII/Unicode string[*3] If SUBSCRIBE is specified again for the topic for which SUBSCRIBE has been already set with another subscribe ID, error completion occurs. If UNSUBSCRIBE is specified for a topic for which SUBSCRIBE is not set, normal completion occurs without any action.

*1 While the normal MQTT uses topics to distinguish the receive data, this label uses subscribe IDs (numbers) in the replacement of the topics.
For example, when the topic of test/abc1 is replaced with the subscribe ID 1 and the topic of test/bcd2 is replaced with the subscribe ID 2, those numbers are output at MQTT_Receive. Therefore, the topic can be determined from the ID.

*2 The Publish topic name data area is treated as 511 bytes (excluding NULL). Therefore, set the number of elements of the array label to 256. If the number of elements in the array label is insufficient, an undefined value may be included.

*3 For GX Works3, the Unicode string is UTF-16.

Output label

No.	Variable name	Name	Data type	Default value	Description
(10)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(11)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(12)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(13)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(14)	o_bSendOK	Send completion	Bit	Off	When this label is on, it indicates that Subscribe/Unsubscribe has been completed normally.
(15)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■Controller

Target module	Firmware version	Engineering tool
MXF100	106 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	184 steps The number of steps of the FB embedded in the program varies depending on the controller used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 0.55K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the controller used, the device specified in an argument and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 0 points • Long index register: 0 points When using an interrupt program, do not use the index register within the interrupt program.
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

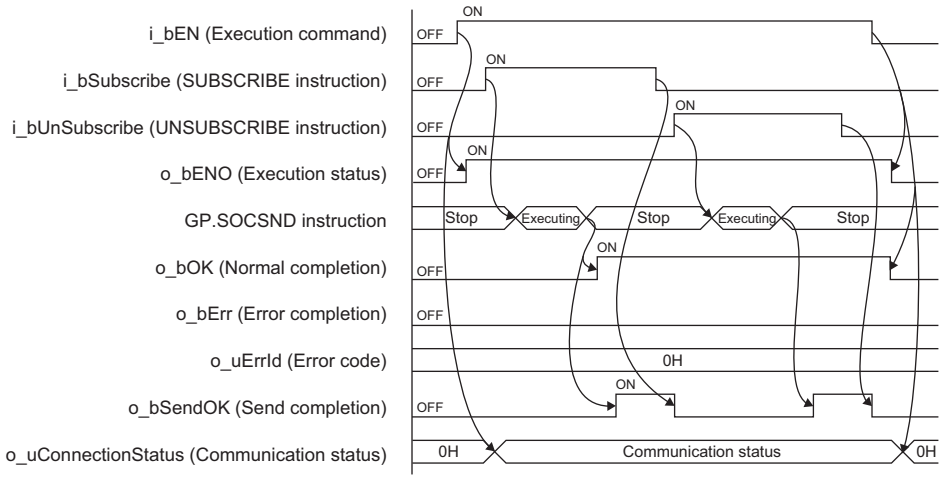
Processing

- After i_bEN (Execution command) turns on, the SUBSCRIBE command is sent to an MQTT broker (server) by turning on i_bSubscribe (SUBSCRIBE instruction) and the UNSUBSCRIBE command is sent by turning on (rising) i_bUnSubscribe (UNSUBSCRIBE instruction).
- After i_bEN (Execution command) turns on, o_bOK (Normal completion) turns on when the first SUBSCRIBE/UNSUBSCRIBE is completed.
- When the SUBSCRIBE/UNSUBSCRIBE is completed, o_bSendOK (Send completion) turns on. When i_bSubscribe (SUBSCRIBE instruction) or i_bUnSubscribe (UNSUBSCRIBE instruction) turns off from on, o_bSendOK (Send completion) turns off.
- If an error occurs during the SUBSCRIBE/UNSUBSCRIBE execution, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- While i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G108979) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

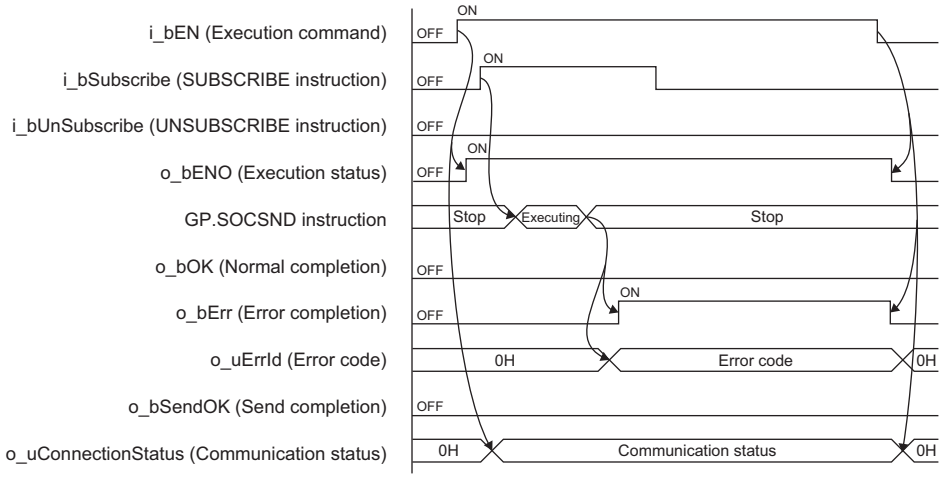
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instruction.

GP.SOCSND instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- Do not concurrently turn on i_bSubscribe (SUBSCRIBE instruction) and i_bUnSubscribe (UNSUBSCRIBE instruction).
- When using more than one of this FB, do not concurrently turn on i_bSubscribe (SUBSCRIBE instruction) or i_bUnSubscribe (UNSUBSCRIBE instruction) of the more than one FBs.
- If the number of elements in the array label specified in i_unSubscribeTopicNameData (Subscribe topic name data) is insufficient, an undefined value may be included.
- Specify the start element of the array label in i_unSubscribeTopicNameData (Subscribe topic name data).

Parameter setting

For the parameter setting, refer to the following.

☞ Page 87 Parameter setting

Performance value

Controller	Input label	Performance value		Number of scans
	Command	Processing time	Maximum scan time	
MXF100*1	SUBSCRIBE instruction	6.000ms	0.752ms	17 scans
	UNSUBSCRIBE instruction	126.000ms	0.718ms	314 scans

*1 A personal computer in the same LAN is connected via a hub.

Error code

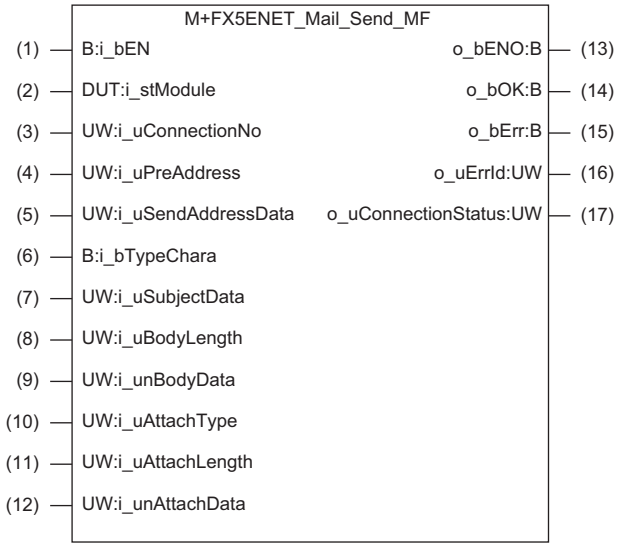
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	Contention has occurred between i_bSubscribe (SUBSCRIBE instruction) and i_bUnSubscribe (UNSUBSCRIBE instruction).	Review the timing of instructions so that they do not cause contention.
102H	The i_uMaxQoS (Maximum QoS) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uTopicMessageFormat (Topic/message format) setting value is out of range.	After reviewing the setting, re-execute the FB.
105H	The i_uSubscribeTopicNameDataAddr (Subscribe topic data start address) topic name is not set.	After setting the topic name with one or more characters, re-execute the FB.
150H	The i_uSubscribeId (Subscribe ID) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

*1 The output will be only for a single scan.

2.21 M+FX5ENET_Mail_Send_MF (Sending of E-mail)

Overview

This FB establishes a TLS/TCP session with an SMTP server. Then, it sends E-mail data.
After sending the E-mail, it disconnects the TLS/TCP session.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module for which the FB is to be executed. Specify the module label of the modules. (Example: FX5ENET_1)
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 32	Specify the number of the connection to be used.
(4)	i_uPreAddress	Preset send address instruction	Word [Unsigned]/Bit String [16-bit]	0000H to 03FFH	When the send destination E-mail addresses whose parameters are set with GXW3 are specified, the corresponding bits turn on. • b0: Send destination E-mail address No.1 • b1: Send destination E-mail address No.2 ⋮ • b9: Send destination E-mail address No.10
(5)	i_uSendAddressData	Send destination address data	Word [Unsigned]/Bit String [16-bit]	—	Specify the start element of the array label in which to store the send destination E-mail address within 256 characters.*2 Multiple E-mail addresses (10 or more is also possible.) can be specified in the comma-delimited format. Also, this label can be concurrently used with the preset send address instruction. Set the end of string to NULL because it is used for size determination. If the number of characters reaches the maximum length, secure the space of 257 bytes because NULL is set at the position of the maximum length + 1 in the subject.
(6)	i_bTypeChara	ASCII/UTF-16 string specification	Bit	On, off	On: ASCII is used for subject/message body. Off: UTF-16 is used for subject/message body.

No.	Variable name	Name	Data type	Range	Description
(7)	i_uSubjectData	Subject data	Word [Unsigned]/Bit String [16-bit]	—	Specify the start element of the array label in which to store the subject. The maximum number of characters varies depending on the setting value of the ASCII/UTF-16 string specification.*3 ■Maximum number of characters • For ASCII: 128 bytes/128 characters • For Unicode: 128 bytes/64 characters Set the end of string to NULL because it is used for size determination. If the number of characters reaches the maximum length, secure the space of 65 words (130 bytes) because NULL is set at the position of the maximum length + 1 in the subject.
(8)	i_uBodyLength	Number of message body characters	Word [Unsigned]/Bit String [16-bit]	0 to 1024, 0 to 512	Specify the number of message body data characters. • When ASCII is used: 0 to 1024 characters • When UTF-16 is used: 0 to 512 characters When 0 is specified, the number of message body characters is automatically set.*1
(9)	i_unBodyData	Message body data	Word [Unsigned]/Bit String [16-bit]	—	Specify the start element of the array label in which to store the message body. When the number of message body characters is 0, set the end of string to NULL because it is used for size determination. If the number of characters reaches the maximum length, secure the space of 513 words (1026 bytes) because NULL is set at the position of the maximum length + 1 in the subject.
(10)	i_uAttachType	Attachment format	Word [Unsigned]/Bit String [16-bit]	0 to 3	Specify the presence/absence of an attachment and the file format. • 0: No attachment • 1: CSV format • 2: BIN format • 3: ASCII format
(11)	i_uAttachLength	Attachment size	Word [Unsigned]/Bit String [16-bit]	0 to 16384	Specify the attachment size (number of words). When the format is 0 (no attachment), this item is not used.*4
(12)	i_unAttachData	Attachment data	Word [Unsigned]/Bit String [16-bit]	—	Specify the start element of the array label in which the attachment (up to 32768 bytes) data is stored.

*1 The message body data area is treated as the number of bytes (excluding NULL) specified in the number of message body characters. Therefore, set the number of elements of the array label according to the number of message body characters. If 0 is specified for the number of message body characters, the area is treated as the maximum length + 1 byte. Therefore, set the number of elements of the array label to 513. If the number of elements in the array label is insufficient, an undefined value may be included.

*2 The send destination address data area is treated as 256 bytes (excluding NULL). Therefore, set the number of elements of the array label to 128. If the number of elements in the array label is insufficient, an undefined value may be included.

*3 The subject data area is treated as 128 bytes (excluding NULL). Therefore, set the number of elements of the array label to 64. If the number of elements in the array label is insufficient, an undefined value may be included.

*4 The attachment data area is treated as the number of bytes (excluding NULL) specified in the attachment size. Therefore, set the number of elements of the array label according to the attachment size. If the number of elements in the array label is insufficient, an undefined value may be included.

Output label

No.	Variable name	Name	Data type	Default value	Description
(13)	o_bENO	Execution status	Bit	Off	The execution status of the FB is output. • On: In execution • Off: Not in execution
(14)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the FB has been processed normally.
(15)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(16)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(17)	o_uConnectionStatus	Communication status	Word [Unsigned]/Bit String [16-bit]	0	Monitors the FX5-ENET status buffer memory. When i_bEN (Execution command) is on, the status is constantly output. For details, refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

FB details

Available device

■Ethernet module

Target module	Firmware version	Engineering tool
FX5-ENET	1.200 or later	GX Works3 Version 1.095Z or later

■Controller

Target module	Firmware version	Engineering tool
MXF100	106 or later	GX Works3 Version 1.095Z or later

Basic specifications

Item	Description
Number of steps	260 steps The number of steps of the FB embedded in the program varies depending on the controller used, the input/output definitions, and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Label usage	• Label: 1.06K points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the controller used, the device specified in an argument and the option setting of GX Works3. For the option settings of GX Works3, refer to the following. 📖GX Works3 Operating Manual
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

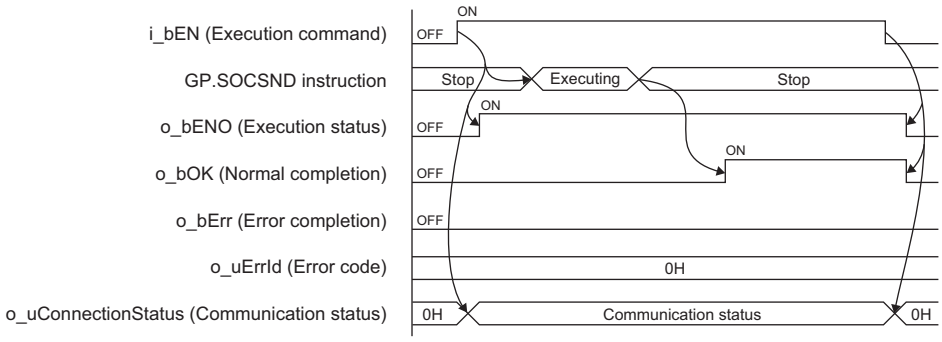
Processing

- After i_bEN (Execution command) turns on, this FB sends the E-mail send command.
- When the E-mail send command is completed, this FB turns on o_bOK (Normal completion) or turns on o_bErr (Error completion) and stores the error code in o_uErrId (Error code).
- When i_bEN (Execution command) is on, o_uConnectionStatus (Communication status) returns the buffer memory session status (Un\G4380) value.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the following.

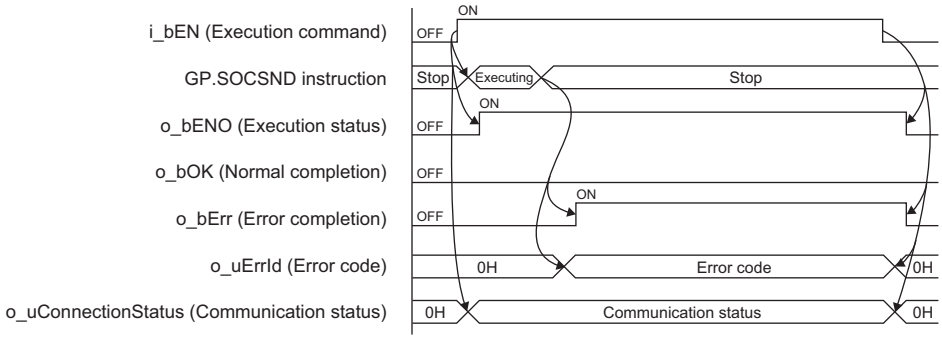
☞ Page 87 Parameter setting

Timing chart of I/O signals

■For normal completion



■For error completion



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with your system and the required operation.
- This FB uses the following instructions.

GP.OPEN instruction
GP.SOCSND instruction
GP.CLOSE instruction

- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB requires circuit settings for all the input labels.
- This FB cannot be used in an interrupt program.
- When using more than one of this FB, do not concurrently turn on i_bEN (Execution command) of the more than one FBs.
- When K0 is specified for i_uBodyLength (Number of message body characters) and i_bTypeChara (ASCII/UTF-16 string specification) is ASCII, the maximum send message size is 1023 bytes.
- When K0 is specified for i_uBodyLength (Number of message body characters) and i_bTypeChara (ASCII/UTF-16 string specification) is Unicode, the maximum send message size is 511 words.
- To send the maximum size of message body data, follow the conditions listed below.
  - Do not specify any NULL character at the end of message body data.
  - When i_bTypeChara (ASCII/UTF-16 string specification) is ASCII, specify K1024 for i_uBodyLength (Number of message body characters).
  - When i_bTypeChara (ASCII/UTF-16 string specification) is Unicode, specify K512 for i_uBodyLength (Number of message body characters).
- If the number of elements in the array label specified in i_unSendAddressData (Send destination address data), i_unSubjectData (Subject data), i_unBodyData (Message body data), or i_unAttachData (Attachment data) is insufficient, an undefined value may be included.
- Specify the start element of the array label in i_unSendAddressData (Send destination address data), i_unSubjectData (Subject data), i_unBodyData (Message body data), and i_unAttachData (Attachment data).

Parameter setting

Set the target device connection configuration for E-mail send by using GX Works3.

Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-ENET] ⇨ [Basic Settings] ⇨ [External Device Configuration]

In the target device connection configuration setting, set the protocol to the TLS connection or TCP connection. Set the certificate by using Certificate Configuration Tool for FX5-ENET. For details on the setting method, refer to the following.

MELSEC iQ-F FX5 Ethernet Module User's Manual

Performance value

Controller	Input label	Performance value		Number of scans
	Send size (byte)	Processing time	Maximum scan time	
MXF100*1	1	1250.000ms	0.996ms	5742 scans
	16384	1260.000ms	1.160ms	6378 scans
	32768	1350.000ms	1.230ms	7200 scans

*1 Connect with a free mail service.

Error code

Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	The i_uPreAddress (Preset send address instruction) setting value is out of range.	After reviewing the setting, re-execute the FB.
102H	The i_uBodyLength (Number of message body characters) setting value is out of range.	After reviewing the setting, re-execute the FB.
103H	The i_uAttachType (Attachment format) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uAttachLength (Attachment size) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of the execution command until normal completion, error completion, establishment completion, or disconnection completion turns on.*1
Latest error code (session)	Same as the latest error code stored in the buffer memory.	Refer to the following. MELSEC iQ-F FX5 Ethernet Module User's Manual

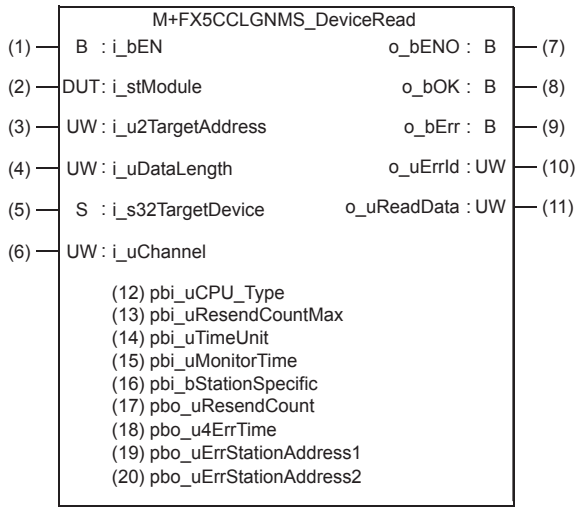
*1 The output will be only for a single scan.

3 FB FOR CC-Link IE TSN

3.1 M+FX5CCLGNMS_DeviceRead (Reading of another station device)

Overview

This FB reads data from a specified device in the programmable controller of another station.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.
(3)	i_u2TargetAddress	Target station address	Word [Unsigned]/Bit String [16-bit] (0..1)	The setting range differs depending on the target station address specification method.	■When the target station address specification method is off Specify the network number and station number for the target station. To specify with a label, use an array for the data type. b15 b0 1st word: Network number: 1 to 239 2nd word: Station number • 125: Master station • 1 to 120: Device stations ■When the target station address specification method is on Specify the IP address for the target station. To specify with a label, use an array for the data type. • Valid range: 00000001H to FFFFFFFEH Specify 1 to 254 (FEH) for the fourth octet. b15 b8 b7 b0 1st word: Third octet / Fourth octet 2nd word: First octet / Second octet

No.	Variable name	Name	Data type	Range	Description
(4)	i_uDataLength	Read data length	Word [Unsigned]/Bit String [16-bit]	1 to 960	Specify the number of words to be read. • When the target station is RCPU, QCPU, LCPU, or FX5CPU: 1 to 960 (words) • When the target station is QnACPU: 1 to 480 (words)
(5)	i_s32TargetDevice	Target station read device	Character string (32)	—	Specify the head device of the target station from which data is to be read. Refer to the MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on specifying the device.
(6)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the channel to be used by own station.

Output label

No.	Variable name	Name	Data type	Default value	Description
(7)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(8)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the device has been read out correctly.
(9)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(10)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.
(11)	o_uReadData	Read data storage device	Word [Unsigned]/Bit String [16-bit]	0	Specify the start number of the device for storing the read data.

Public label (operation parameters)

No.	Variable name	Name	Data type	Range	Description
(12)	pbi_uCPU_Type	Target station CPU type	Word [Unsigned]/Bit String [16-bit]	0000H, 03D0H to 03D3H, 03E0H to 03E3H, 03FFH	Specify the CPU type of the target station. • 0000H: To CPU of target station (control CPU) • 03D0H: To control system CPU • 03D1H: To standby system CPU • 03D2H: To system A CPU • 03D3H: To system B CPU • 03E0H: To multiple CPU No.1 • 03E1H: To multiple CPU No.2 • 03E2H: To multiple CPU No.3 • 03E3H: To multiple CPU No.4 • 03FFH: To CPU of target station (control CPU)
(13)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(14)	pbi_uTimeUnit	Arrival monitoring time unit	Word [Unsigned]/Bit String [16-bit]	0, 1	Specify the arrival monitoring time unit.*1 • 0: 1s • 1: 100ms
(15)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0 to 65535	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in the "maximum number of resends" is reached. • 0: 10 seconds ■When arrival monitoring time unit is set to 1s • Valid range 1 to 32767: 1 to 32767 seconds ■When arrival monitoring time unit is set to 100ms • Valid range 1 to 65535: 1 to 65535 × 100ms
(16)	pbi_bStationSpecific	Target station address specification method	Bit	On, off	Specify the target station address specification method. • Off: Specify with the network number and station number. • On: Specify with the IP address (IPv4).

*1 Set the lower 2 bits (bit 0 and 1) of the set value in bits 8 and 9 of the completion type for READ instruction control data error. With the dedicated instructions, if the lower 2 bits exceed the valid range, an error (D24AH) will occur.

Public label (monitor)

No.	Variable name	Name	Data type	Default value	Description
(17)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	0	The number of resends performed (result) is stored. When an error is detected, the number of resends performed (results) between the detection of the error to stopping of resending is stored.
(18)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	0	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Year (00H to 99H) (Last 2 digits of the year) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Year (00H to 99H) (Upper 2 digits of the year) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(19)	pbo_uErrStationAddress1	Error-detected station IP address 1	Word [Unsigned]/Bit String [16-bit]	0	■When the target station address specification method is off The network number of the station in which an error was detected is stored. ■When the target station address specification method is on The IP address (third octet, fourth octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • 0102H
(20)	pbo_uErrStationAddress2	Error-detected station IP address 2	Word [Unsigned]/Bit String [16-bit]	0	■When the target station address specification method is off The station number of the station in which an error was detected is stored. • 007DH (125): Master station • 0001H to 0078H (1 to 120): Device station ■When the target station address specification method is on The IP address (first octet, second octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • C0A8H

FB details

Available device

■CC-Link IE TSN module

Target module	Firmware version	Engineering tool
FX5-CCLGN-MS	—	GX Works3 Version 1.065T or later

■CPU module

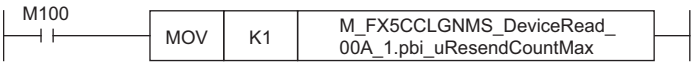
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

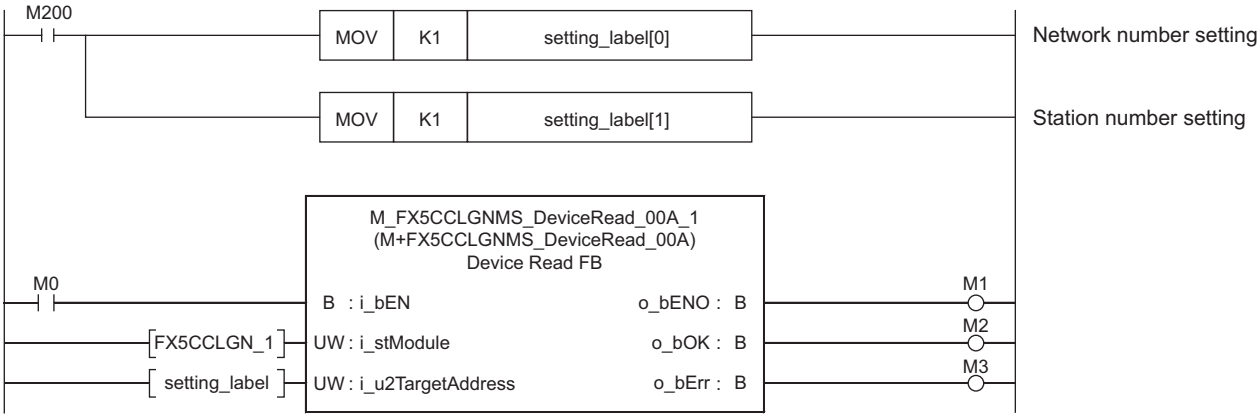
Item	Description
Language	Ladder diagram
Number of steps	152 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Label usage	• Label: 0.05K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

- When i_bEN (Execution command) is turned on, data corresponding to the read data length is read from the read device of the specified target station address.
- If an error occurs during device read, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 143 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 143 Parameter setting.
- When setting or monitoring the public label (operation parameters) or public label (monitor), add a program to execute the setting or monitor as described below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the maximum number of resends (M_FX5CCLGNMS_DeviceRead_00A_1.pbi_uResendCountMax) to set the number of resends to be performed if the transmission is not completed within the monitoring time specified in the arrival monitoring time.

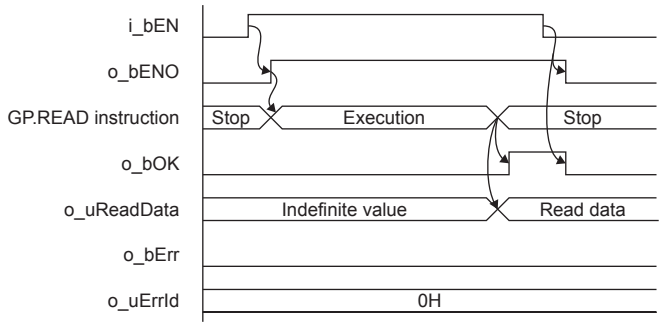


- Since the i_u2TargetAddress (Target station address) data type is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set that label value in i_u2TargetAddress (Target station address). The following program sets the target station network number and station number in i_u2TargetAddress (Target station address). Define the global label setting_label (data type: bit, class: VAR_GLOBAL). Set the target station network number 1 (K1) in setting_label[0] and CC-Link IE TSN station number 1 (K1) in setting_label[1].



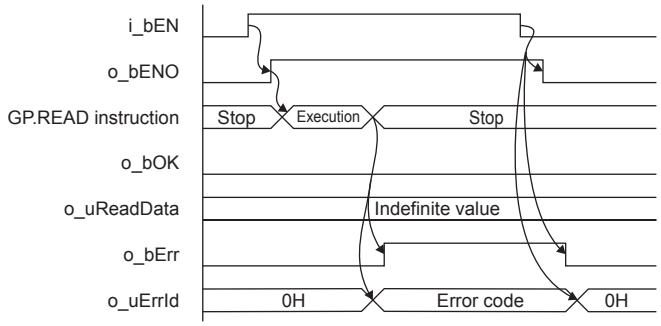
Timing chart of I/O signals

■For normal completion



■For error completion

(Same when a module error has occurred)



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.READ instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.READ instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- When booting the CPU module, if the program file using this FB is specified for the booting, add the program-specific label default value file also to the boot settings. Refer to the 📖MELSEC iQ-F FX5 User's Manual (Application) for details on the setting methods.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label (operation parameter) as needed.

Parameter setting

For CC-Link IE TSN settings, set the parameters on GX Works3.

Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-CCLGN-MS]

Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual.

Performance value

CPU module	Measurement conditions*3	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5U, FX5UC*1*2	Read data length: 1 word	9.26ms	0.717ms	26 scans
	Read data length: 960 words	9.94ms	1.280ms	26 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.
*3 The read data is K1234.

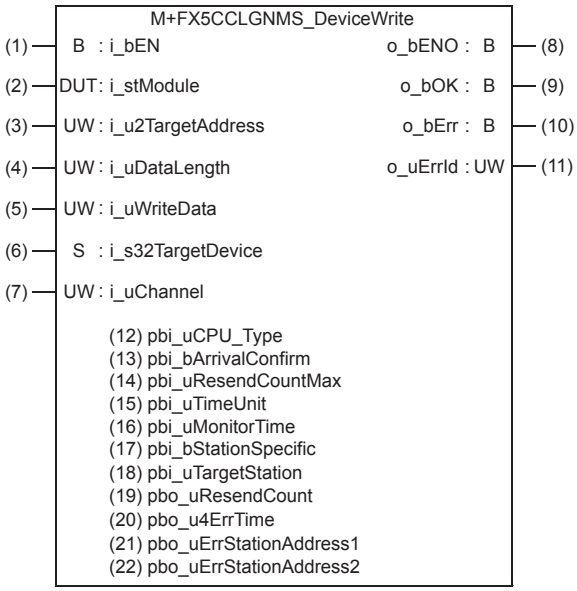
Error code

Error code (hexadecimal)	Description	Action
C000H to CFFFH D000H to DFFFH	This error code is the same as the error code that occurs with the (GP.READ) instruction for reading data in the programmable controller of another station.	Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual.

3.2 M+FX5CCLGNMS_DeviceWrite (Writing to another station device)

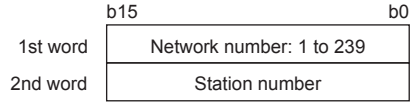
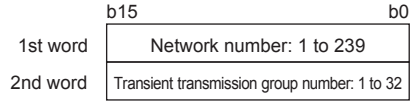
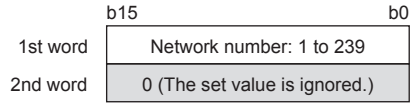
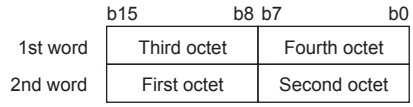
Overview

This FB writes data to a specified device in the programmable controller of another station.



Labels

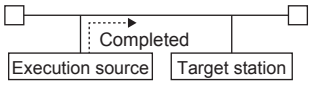
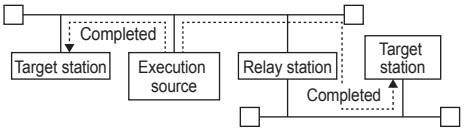
Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.
(3)	i_u2TargetAddress	Target station address	Word [Unsigned]/Bit String [16-bit] (0..1)	The setting range differs depending on the target station address specification method.	When the target station address specification method is off Specify the network number and station number for the target station. To specify with a label, use an array for the data type. ■When "target station specification method" is set to 0 to specify a station number  • 125: Master station • 1 to 120: Device stations ■When "target station specification method" is set to 1 to specify a group  ■When "target station specification method" is set to 2 to specify all stations 
					When the target station address specification method is on Specify the IP address for the target station. To specify with a label, use an array for the data type. • Valid range: 00000001H to FFFFFFFEH Specify 1 to 254 (FEH) for the fourth octet. 
(4)	i_uDataLength	Write data length	Word [Unsigned]/Bit String [16-bit]	1 to 960	Specify the number of words to be written. • When writing to RCPU, QCPU, LCPU, or FX5CPU: 1 to 960 (words) • When writing to QnACPU: 1 to 480 (words)
(5)	i_uWriteData	Write data storage device	Word [Unsigned]/Bit String [16-bit]	—	Specify the head device of the own station that is storing the written data.
(6)	i_s32TargetDevice	Target station write device	Character string (32)	—	Specify the head device of the target station to which data is to be written. Refer to the MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on specifying the device.
(7)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the channel to be used by own station.

Output label

No.	Variable name	Name	Data type	Default value	Description
(8)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(9)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the device has been written correctly.
(10)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(11)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.

Public label (operation parameters)

No.	Variable name	Name	Data type	Range	Description
(12)	pbi_uCPU_Type	Target station CPU type	Word [Unsigned]/Bit String [16-bit]	0000H, 03D0H to 03D3H, 03E0H to 03E3H, 03FFH	Specify the CPU type of the target station. • 0000H: To CPU of target station (control CPU) • 03D0H: To control system CPU • 03D1H: To standby system CPU • 03D2H: To system A CPU • 03D3H: To system B CPU • 03E0H: To multiple CPU No.1 • 03E1H: To multiple CPU No.2 • 03E2H: To multiple CPU No.3 • 03E3H: To multiple CPU No.4 • 03FFH: To CPU of target station (control CPU)
(13)	pbi_bArrivalConfirm	Arrival acknowledgment	Bit	On, off	Specify whether to use arrival acknowledgment. ■Off: None • When the target station is within the own network, sending data from the own station completes the sending.  ■On: Check • Sending data is completed when the data is written to the target station. 
(14)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(15)	pbi_uTimeUnit	Arrival monitoring time unit	Word [Unsigned]/Bit String [16-bit]	0, 1	Specify the arrival monitoring time unit.*1 • 0: 1s • 1: 100ms
(16)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0 to 65535	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in the "maximum number of resends" is reached. • 0: 10 seconds ■When arrival monitoring time unit is set to 1s • Valid range 1 to 32767: 1 to 32767 seconds ■When arrival monitoring time unit is set to 100ms • Valid range 1 to 65535: 1 to 65535 × 100ms
(17)	pbi_bStationSpecific	Target station address specification method	Bit	On, off	Specify the target station address specification method. • Off: Specify with the network number and station number. • On: Specify with the IP address (IPv4).
(18)	pbi_uTargetStation	Target station specification method	Word [Unsigned]/Bit String [16-bit]	0 to 2	Specify the target station specification method. • 0: Station number specification Station with station number specified with the target station address • 1: Group specification All station numbers in transient transmission group number specified with target station address (Selectable when off (none) is specified for arrival acknowledgment.) • 2: All stations All station numbers in network number specified with target station address (simultaneous broadcast excluding own station) (Selectable when off (none) is specified for arrival acknowledgment.)

*1 Set the lower 2 bits (bit 0 and 1) of the set value in bits 8 and 9 of the completion type for WRITE instruction control data execution/error. With the dedicated instructions, if the lower 2 bits exceed the valid range, an error (D24AH) will occur.

Public label (monitor)

No.	Variable name	Name	Data type	Default value	Description
(19)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	0	The number of resends performed (result) is stored. When an error is detected, the number of resends performed (results) between the detection of the error to stopping of resending is stored.
(20)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	0	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Year (00H to 99H) (Last 2 digits of the year) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Year (00H to 99H) (Upper 2 digits of the year) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(21)	pbo_uErrStationAddress1	Error-detected station IP address 1	Word [Unsigned]/Bit String [16-bit]	0	■When the target station address specification method is off The network number of the station in which an error was detected is stored. ■When the target station address specification method is on The IP address (third octet, fourth octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • 0102H
(22)	pbo_uErrStationAddress2	Error-detected station IP address 2	Word [Unsigned]/Bit String [16-bit]	0	■When the target station address specification method is off The station number of the station in which an error was detected is stored. • 007DH (125): Master station • 0001H to 0078H (1 to 120): Device station ■When the target station address specification method is on The IP address (first octet, second octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • C0A8H

FB details

Available device

■CC-Link IE TSN module

Target module	Firmware version	Engineering tool
FX5-CCLGN-MS	—	GX Works3 Version 1.065T or later

■CPU module

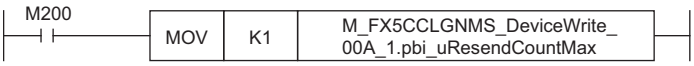
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	181 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Label usage	• Label: 0.05K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

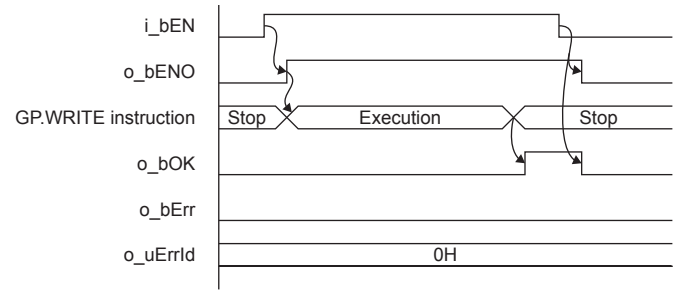
- When i_bEN (Execution command) is turned on, data corresponding to the write data length is written from the device specified with the write data storage device into the target station write device of the specified target station address.
- If an error occurs during device write, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 151 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 143 Parameter setting.
- When setting or monitoring the public label (operation parameters) or public label (monitor), add a program to execute the setting or monitor as described below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the maximum number of resends (M_FX5CCLGNMS_DeviceWrite_00A_1.pbi_uResendCountMax) to set the number of resends to be performed if the transmission is not completed within the monitoring time specified in the arrival monitoring time.



- Since the i_u2TargetAddress (Target station address) data type is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set that label value in i_u2TargetAddress (Target station address). For the setting procedure, refer to ☞ Page 138 M+FX5CCLGNMS_DeviceRead (Reading of another station device).

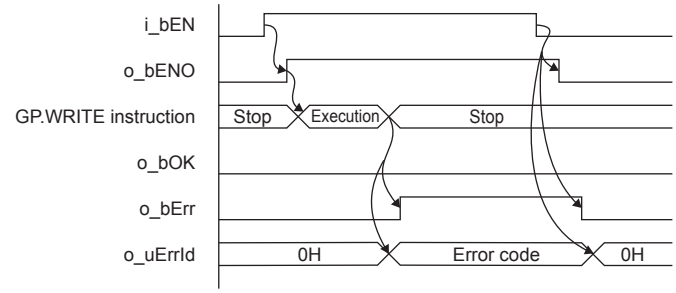
Timing chart of I/O signals

■For normal completion



■For error completion

(Same when a module error has occurred)



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.WRITE instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.WRITE instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- When booting the CPU module, if the program file using this FB is specified for the booting, add the program-specific label default value file also to the boot settings. Refer to the 📖MELSEC iQ-F FX5 User's Manual (Application) for details on the setting methods.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label (operation parameter) as needed.

Parameter setting

For the setting procedure, refer to ☞ Page 143 Parameter setting.

Performance value

CPU module	Measurement conditions*3	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5U, FX5UC*1*2	Write data length: 1 word	8.89ms	0.703ms	25 scans
	Write data length: 960 words	10.2ms	1.430ms	34 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.
*3 The written data is K1234.

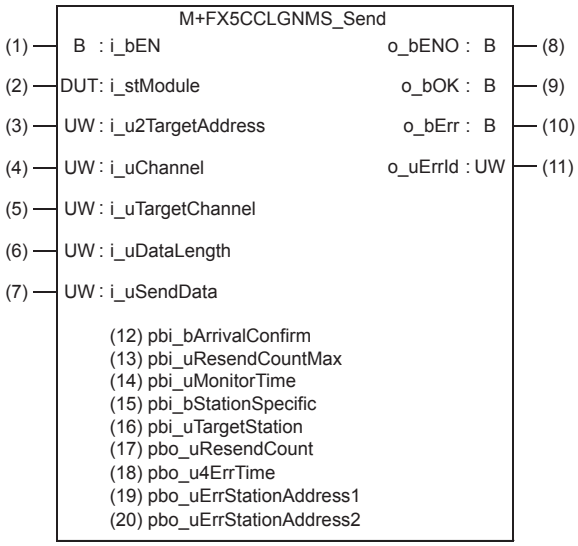
Error code

Error code (hexadecimal)	Description	Action
C000H to CFFFH D000H to DFFFH	This error code is the same as the error code that occurs with the (GP.WRITE) instruction for writing data in the programmable controller of another station.	Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/ Local Module User's Manual.

3.3 M+FX5CCLGNMS_Send (Sending of another station data)

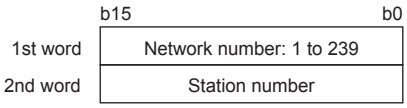
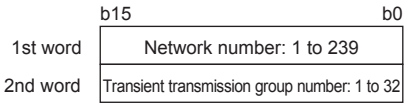
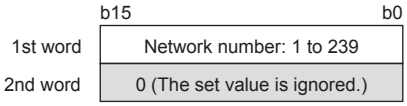
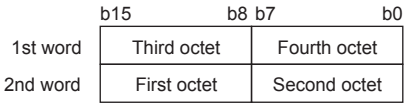
Overview

This FB sends data to the programmable controller of another station.



Labels

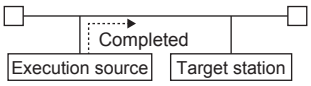
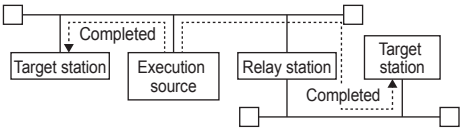
Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.
(3)	i_u2TargetAddress	Target station address	Word [Unsigned]/Bit String [16-bit] (0..1)	The setting range differs depending on the target station address specification method.	When the target station address specification method is off Specify the network number and station number for the target station. To specify with a label, use an array for the data type. ■When "target station specification method" is set to 0 to specify a station number  • 125: Master station • 1 to 120: Device stations ■When "target station specification method" is set to 1 to specify a group  ■When "target station specification method" is set to 2 to specify all stations 
					When the target station address specification method is on Specify the IP address for the target station. To specify with a label, use an array for the data type. • Valid range: 00000001H to FFFFFFFEH Specify 1 to 254 (FEH) for the fourth octet. 
(4)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the channel to be used by own station.
(5)	i_uTargetChannel	Target station data storage channel	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the channel of the target station for storing data. When the target station is a CC-Link IE Field Network master/local module, specify 1 or 2.
(6)	i_uDataLength	Send data length	Word [Unsigned]/Bit String [16-bit]	1 to 960	Specify the number of words to be sent. • When the target station is RCPU, QCPU, LCPU, or FX5CPU: 1 to 960 (words) • When the target station is QnACPU: 1 to 480 (words)
(7)	i_uSendData	Send data storage device	Word [Unsigned]/Bit String [16-bit]	—	Specify the head device of the own station containing the send data.

Output label

No.	Variable name	Name	Data type	Default value	Description
(8)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(9)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the data has been sent correctly.
(10)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(11)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.

Public label (operation parameters)

No.	Variable name	Name	Data type	Range	Description
(12)	pbi_bArrivalConfirm	Arrival acknowledgment	Bit	On, off	Specify whether to use arrival acknowledgment. ■Off: None • When the target station is within the own network, sending data from the own station completes the sending.  ■On: Check • Sending data is completed when the data is written to the target station. 
(13)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(14)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in the "maximum number of resends" is reached. • 0: 10 seconds • Valid range 1 to 32767: 1 to 32767 seconds
(15)	pbi_bStationSpecific	Target station address specification method	Bit	On, off	Specify the target station address specification method. • Off: Specify with the network number and station number. • On: Specify with the IP address (IPv4).
(16)	pbi_uTargetStation	Target station specification method	Word [Unsigned]/Bit String [16-bit]	0 to 2	Specify the target station specification method. • 0: Station number specification Station with station number specified with the target station address • 1: Group specification All station numbers in transient transmission group number specified with target station address (Selectable when off (none) is specified for arrival acknowledgment.) • 2: All stations All station numbers in network number specified with target station address (simultaneous broadcast excluding own station) (Selectable when off (none) is specified for arrival acknowledgment.)

Public label (monitor)

No.	Variable name	Name	Data type	Default value	Description
(17)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	0	The number of resends performed (result) is stored. When an error is detected, the number of resends performed (results) between the detection of the error to stopping of resending is stored.
(18)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	0	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Year (00H to 99H) (Last 2 digits of the year) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Year (00H to 99H) (Upper 2 digits of the year) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(19)	pbo_uErrStationAddress1	Error-detected station IP address 1	Word [Unsigned]/Bit String [16-bit]	0	■When the target station address specification method is off The network number of the station in which an error was detected is stored. ■When the target station address specification method is on The IP address (third octet, fourth octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • 0102H
(20)	pbo_uErrStationAddress2	Error-detected station IP address 2	Word [Unsigned]/Bit String [16-bit]	0	■When the target station address specification method is off The station number of the station in which an error was detected is stored. • 007DH (125): Master station • 0001H to 0078H (1 to 120): Device station ■When the target station address specification method is on The IP address (first octet, second octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • C0A8H

FB details

Available device

■CC-Link IE TSN module

Target module	Firmware version	Engineering tool
FX5-CCLGN-MS	—	GX Works3 Version 1.065T or later

■CPU module

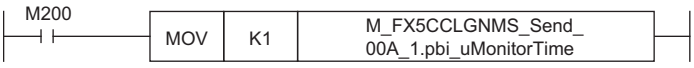
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	166 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.04K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

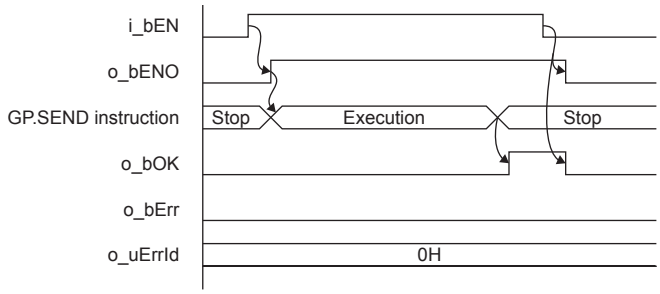
- When i_bEN (Execution command) is turned on, data corresponding to the send data length is sent from the send data storage device to the specified target station address.
- If an error occurs while sending data, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 158 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 143 Parameter setting.
- When setting or monitoring the public label (operation parameters) or public label (monitor), add a program to execute the setting or monitor as described below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the arrival monitoring time (M_FX5CCLGNMS_Send_00A_1.pbi_uMonitorTime) to specify the monitoring time until the completion of processing.



- Since the i_u2TargetAddress (Target station address) data type is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set that label value in i_u2TargetAddress (Target station address). For the setting procedure, refer to ☞ Page 138 M+FX5CCLGNMS_DeviceRead (Reading of another station device).

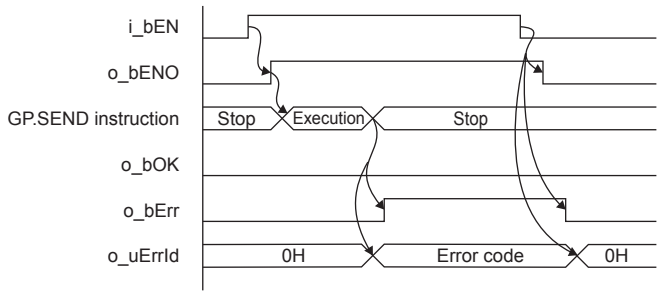
Timing chart of I/O signals

■For normal completion



■For error completion

(Same when a module error has occurred)



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.SEND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.SEND instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- When booting the CPU module, if the program file using this FB is specified for the booting, add the program-specific label default value file also to the boot settings. Refer to the 📖MELSEC iQ-F FX5 User's Manual (Application) for details on the setting methods.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label (operation parameter) as needed.

Parameter setting

For the setting procedure, refer to ☞ Page 143 Parameter setting.

Performance value

CPU module	Measurement conditions*3	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5U, FX5UC*1*2	Send data length: 1 word	5.36ms	0.655ms	10 scans
	Send data length: 960 words	7.56ms	1.390ms	17 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.
*3 The send data is K1234.

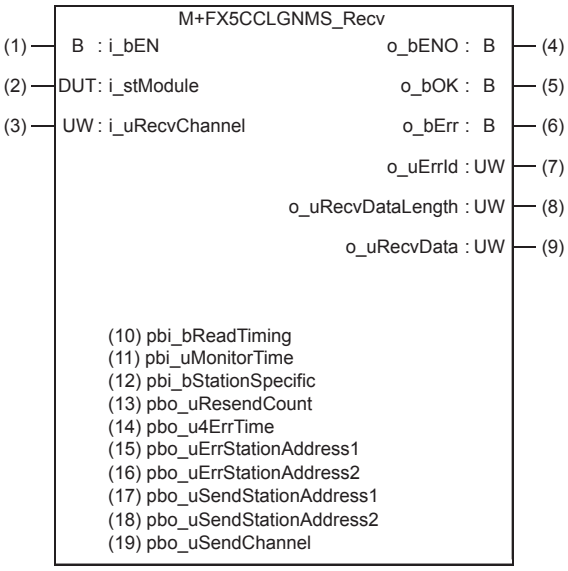
Error code

Error code (hexadecimal)	Description	Action
C000H to CFFFH D000H to DFFFH	This error code is the same as the error code that occurs with the (GP.SEND) instruction for sending data to the programmable controller of another station.	Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/ Local Module User's Manual.

3.4 M+FX5CCLGNMS_Recv (Receiving of another station data)

Overview

This FB reads the data received from the programmable controller of another station.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.
(3)	i_uRecvChannel	Receive data storage channel	Word [Unsigned]/Bit String [16-bit]	1 to 8	Specify the channel containing the data to be read.

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that reading of the received data has completed normally.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.
(8)	o_uRecvDataLength	Received data length	Word [Unsigned]/Bit String [16-bit]	0	The number of received data is stored. • 1 to 960 (words)
(9)	o_uRecvData	Received data storage device	Word [Unsigned]/Bit String [16-bit]	0	Specify the start number of the device for storing received data.

Public label (operation parameters)

No.	Variable name	Name	Data type	Range	Description
(10)	pbi_bReadTiming	Read timing	Bit	—	This label is not used in the FB program and does not need to be set. Data is read at the first END processing after the unit FB is started.
(11)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0 to 32767	Specify the monitoring time until completion of processing (valid only when read timing is on). If the processing is not completed within the monitoring time, it will end with an error. • 0: 10 seconds • Valid range 1 to 32767: 1 to 32767 seconds
(12)	pbi_bStationSpecific	Send station address display method	Bit	On, off	Specify the method of displaying the send station address. • Off: Specify with the network number and station number. • On: Specify with the IP address (IPv4).

Public label (monitor)

No.	Variable name	Name	Data type	Default value	Description
(13)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	0	0 is stored in this area.
(14)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	0	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Year (00H to 99H) (Last 2 digits of the year) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Year (00H to 99H) (Upper 2 digits of the year) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(15)	pbo_uErrStationAddress1	Error-detected station IP address 1	Word [Unsigned]/Bit String [16-bit]	0	■When the send station address display method is off The network number of the station in which an error was detected is stored. ■When the send station address display method is on The IP address (third octet, fourth octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • 0102H
(16)	pbo_uErrStationAddress2	Error-detected station IP address 2	Word [Unsigned]/Bit String [16-bit]	0	■When the send station address display method is off The station number of the station in which an error was detected is stored. • 007DH (125): Master station • 0001H to 0078H (1 to 120): Device station ■When the send station address display method is on The IP address (first octet, second octet) of the station in which an error was detected is stored. Example: When IP address is 192.168.1.2 • C0A8H
(17)	pbo_uSendStationAddress1	Send station address 1	Word [Unsigned]/Bit String [16-bit]	0	■When the send station address display method is off The network number and station number of the send station are stored. ■When the send station address display method is on The send station IP address (third octet, fourth octet) is stored. Example: When IP address is 192.168.1.2 • 0102H
(18)	pbo_uSendStationAddress2	Send station address 2	Word [Unsigned]/Bit String [16-bit]	0	■When the send station address display method is off The station number of the send station is stored. • 007DH (125): Master station • 0001H to 0078H (1 to 120): Device station ■When the send station address display method is on The send station IP address (first octet, second octet) is stored. Example: When IP address is 192.168.1.2 • C0A8H
(19)	pbo_uSendChannel	Channel used by send station	Word [Unsigned]/Bit String [16-bit]	0	The channel number used by the send station is stored. • 1 to 8

FB details

Available device

■CC-Link IE TSN module

Target module	Firmware version	Engineering tool
FX5-CCLGN-MS	—	GX Works3 Version 1.065T or later

■CPU module

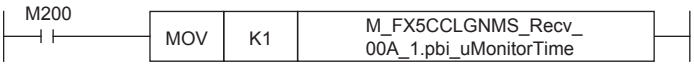
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	140 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.04K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

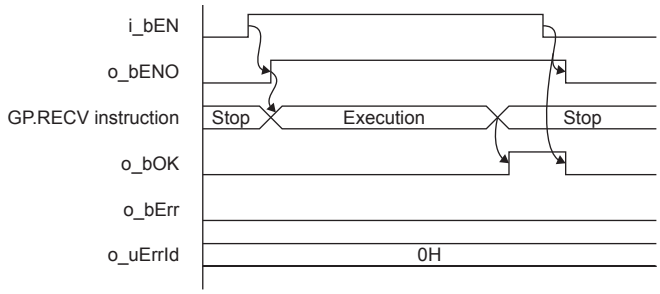
Processing

- When i_bEN (Execution command) is turned on, the received data is read from the specified receive data storage channel and saved into the received data storage device.
- If an error occurs while receiving the data, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 164 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 143 Parameter setting.
- When setting or monitoring the public label (operation parameters) or public label (monitor), add a program to execute the setting or monitor as described below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the arrival monitoring time (M_FX5CCLGNMS_Recv_00A_1.pbi_uMonitorTime) to specify the monitoring time until the completion of processing.



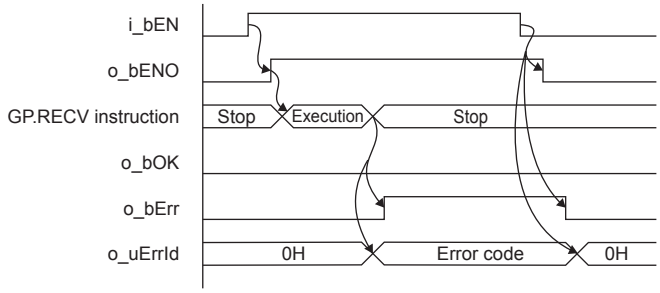
Timing chart of I/O signals

■For normal completion



■For error completion

(Same when a module error has occurred)



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.RECV instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.RECV instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- When booting the CPU module, if the program file using this FB is specified for the booting, add the program-specific label default value file also to the boot settings. Refer to the 📖MELSEC iQ-F FX5 User's Manual (Application) for details on the setting methods.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the receive data storage channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label (operation parameter) as needed.

Parameter setting

For the setting procedure, refer to ☞ Page 143 Parameter setting.

Performance value

CPU module	Measurement conditions*3	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5U, FX5UC*1*2	Received data length: 1 word	0.71ms	0.643ms	1 scan
	Received data length: 960 words	1.75ms	1.550ms	2 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.
*3 The received data is K1234.

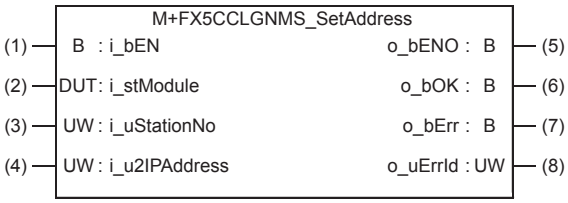
Error code

Error code (hexadecimal)	Description	Action
C000H to CFFFH D000H to DFFFH	This error code is the same as the error code generated with the data receiving (GP.RECV) instruction from the other station's programmable controller.	Refer to the MELSEC iQ-F FX5 CC-Link IE TSN Master/ Local Module User's Manual.

3.5 M+FX5CCLGNMS_SetAddress (Station number/IP address setting)

Overview

This FB sets the station number/IP address for the own station.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.
(3)	i_uStationNo	Own station number	Word [Unsigned]/Bit String [16-bit]	0 to 120	Specify the station number to be set. • Master station: 0 • Local station: 1 to 120
(4)	i_u2IPAddress	IP address	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address for the own station. To specify with a label, use an array for the data type. b15 b8 b7 b0 1st word: Third octet / Fourth octet 2nd word: First octet / Second octet Example: When IP address is 192.168.1.2 1st word: 0102H 2nd word: C0A8H

Output label

No.	Variable name	Name	Data type	Default value	Description
(5)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(6)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the parameters have been set correctly.
(7)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(8)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.

FB details

Available device

■CC-Link IE TSN module

Target module	Firmware version	Engineering tool
FX5-CCLGN-MS	—	GX Works3 Version 1.065T or later

■CPU module

FX5UJ/FX5U/FX5UC CPU module

Basic specifications

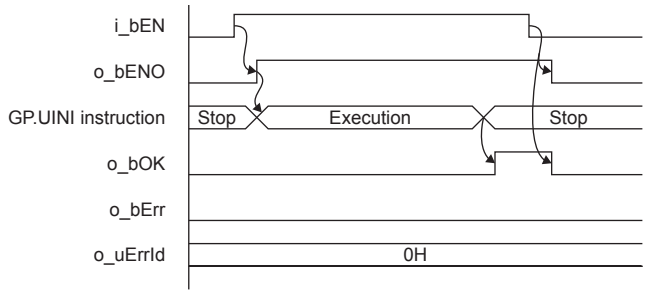
Item	Description
Language	Ladder diagram
Number of steps	89 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.02K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

- The station number/IP address is set in the own station by turning i_bEN (Execution command) on.
- If an error occurs while setting the parameters, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 168 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 143 Parameter setting.

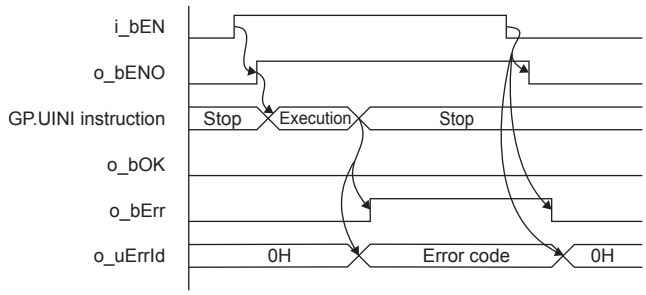
Timing chart of I/O signals

■For normal completion



■For error completion

(Same when a module error has occurred)



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.UINI instruction. Select "Set with programs" with the module parameter "Parameter setting method" to validate the GP.UINI instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.UINI instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- If a broadcast address or reserved address is set for the IP address, the data may not link. Do not set a broadcast address or reserved address for the IP address.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the setting procedure, refer to ☞ Page 143 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5U, FX5UC*1*2	Operation check of setting station No.1 (IP address: 192.168.3.250)	459.0ms	0.845ms	880 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

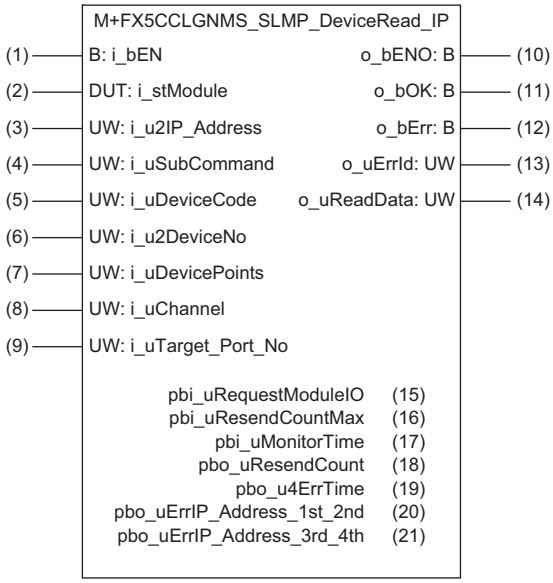
Error code

Error code (hexadecimal)	Description	Action
C000H to CFFFH D000H to DFFFH E000H to EFFFH	This error code is the same as the error code that occurs with the own station number and IP address setting (GP.UINI) instruction.	Refer to the MELSEC iQ-F FX5 CC-Link IE TSN Master/ Local Module User's Manual.

3.6 M+FX5CCLGNMS_SLMP_DeviceRead_IP (Reading of SLMP-compatible device)

Overview

This FB reads device data from the SLMP-compatible device by specifying IP address.



Labels

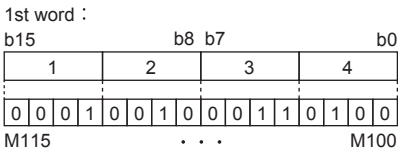
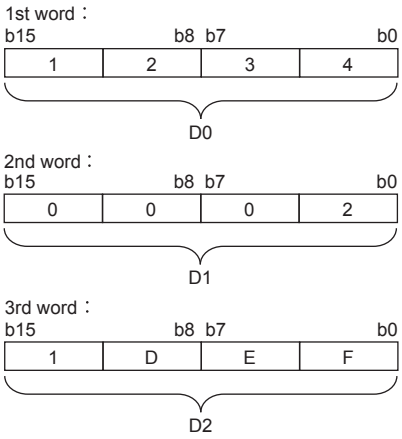
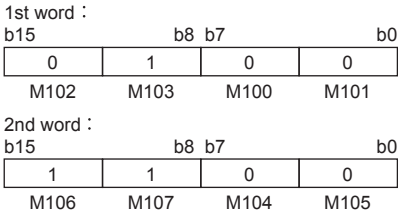
Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.
(3)	i_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device. Specify a value in the range of 1 to 254 (FEH) for the fourth octet. b15 b8 b7 b0 1st word: First octet / Third octet 2nd word: Second octet / Fourth octet
(4)	i_uSubCommand	Sub command	Word [Unsigned]/Bit String [16-bit]	0 to 3	Specify the read unit and specification method of a device. ■0th bit Specify whether the device is read in units of words or in units of bits. • 0: In units of words • 1: In units of bits ■1st bit Specify the combination of the number of digits of the device code and start device number of the device to be read. • 0: Specify the device code in 2 digits and the start device number in 6 digits. • 1: Specify the device code in 4 digits and the start device number in 8 digits.*1
(5)	i_uDeviceCode	Device code	Word [Unsigned]/Bit String [16-bit]	—	Specify the device code of the device to be read in binary code. • When the 1st bit of the subcommand is 0: 2 digits • When the 1st bit of the subcommand is 1: 4 digits
(6)	i_u2DeviceNo	Head device No.	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the start device number of the device to be read in binary code. • When the 1st bit of the subcommand is 0: 6 digits • When the 1st bit of the subcommand is 1: 8 digits
(7)	i_uDevicePoints	Number of device points	Word [Unsigned]/Bit String [16-bit]	1 to 960, 1 to 3972	Specify the number of device points of the device to be read in binary code. • When the 0th bit of the subcommand is 0: 1 to 960 digits • When the 0th bit of the subcommand is 1 Own station channel is 1 to 9: 1 to 3972 digits*2 Own station channel is 10 to 17: 1 to 3960 digits*2
(8)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1 to 17	Specify the channel to be used by own station according to the communication content. • 1: Do not add serial number. • 2 to 9: Add serial number. • 10 to 17: Communicate using station number extension frame.
(9)	i_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the UDP port number of target device.

*1 It can be specified when the target device for reading is MELSEC iQ-R Series. It cannot be specified when the target device for reading is MELSEC-Q/L Series or MELSEC iQ-F Series.

*2 The allowable range is 1 to 3584 when the target device for reading is MELSEC iQ-F Series.

Output label

No.	Variable name	Name	Data type	Default value	Description
(10)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(11)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the device has been read out correctly.
(12)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(13)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.
(14)	o_uReadData	Read data storage destination	Word [Unsigned]/Bit String [16-bit]	0	Specify the start device number of the device for storing the read data. • When the 0th bit of the subcommand is 0, the device data is read in units of words. Example: When reading the bit device M100 to M115 (one word) in units of words  Example: When reading the word device D0 to D2 in units of words  • When the 0th bit of the subcommand is 1, read the device data in units of bits. Example: When reading the bit device M100 to M107 in units of bits 

Operation parameter

No.	Variable name	Name	Data type	Range	Description
(15)	pbi_uRequestModuleIO	Requested module I/O No.	Word [Unsigned]/Bit String [16-bit]	03FFH, 03E0H to 03E3H, 03D0H to 03D3H	Specify the module of the access destination. • 03FFH: Own station, control CPU • 03E0H: Multiple CPU No.1 • 03E1H: Multiple CPU No.2 • 03E2H: Multiple CPU No.3 • 03E3H: Multiple CPU No.4 • 03D0H: Control system CPU • 03D1H: Standby system CPU • 03D2H: System A CPU • 03D3H: System B CPU
(16)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(17)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in "maximum number of resends" is reached. • 0: 10 seconds • 1 to 32767: 1 to 32767 seconds

Public variable

No.	Variable name	Name	Data type	Range	Description
(18)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	The number of resends performed (result) is stored. When an error is detected, the number of resends performed (results) between the detection of the error to stopping of resending is stored.
(19)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored.*1 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Year (00H to 99H) (Last 2 digits of the year) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Year (00H to 99H) (Upper 2 digits of the year) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(20)	pbo_uErrIP_Address_1st_2nd	Error-detected station IP address (1st and 2nd octets)	Word [Unsigned]/Bit String [16-bit]	—	The IP address (first octet, second octet) of the device in which an error was detected is stored.*1 Example: For 192.168.1.2 C0A8H
(21)	pbo_uErrIP_Address_3rd_4th	Error-detected station IP address (3rd and 4th octets)	Word [Unsigned]/Bit String [16-bit]	—	The IP address (third octet, fourth octet) of the device in which an error was detected is stored.*1 Example: For 192.168.1.2 0102H

*1 The value is stored only when a dedicated instruction is completed with an error.
The error-detected station IP address (1st and 2nd octets) and error-detected station IP address (3rd and 4th octets) store values set as the IP address of target device of the input argument.

FB details

Available device

■CC-Link IE TSN module

Target module	Firmware version	Engineering tool
FX5-CCLGN-MS	1.020 or later	GX Works3 Version 1.105K or later

■CPU module

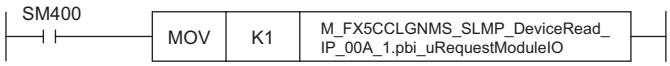
Target module	Firmware version	Engineering tool
FX5UJ	1.070 or later	GX Works3 Version 1.105K or later
FX5U, FX5UC	1.300 or later	GX Works3 Version 1.105K or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	425 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 1056 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed type (multiple scan execution type)

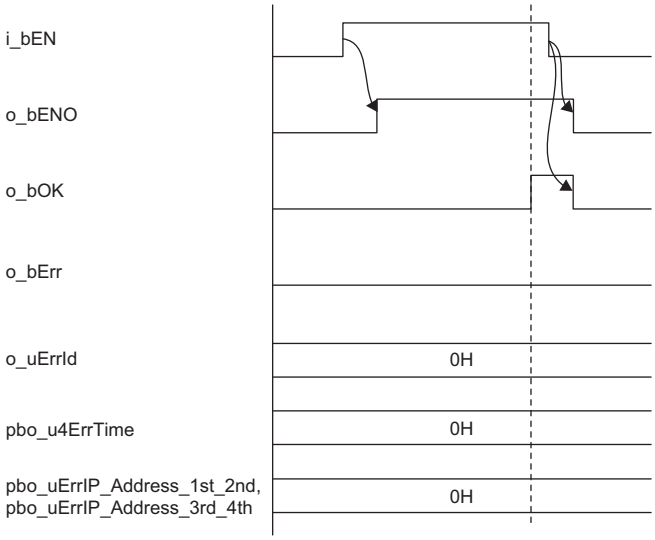
Processing

- When i_bEN (start condition) is turned on, this function reads device data from the SLMP-compatible device.
- Before executing this FB, specify the IP address of target device.
- This FB uses "Device Read (command: 0401H)" of SLMP. SLMP command messages are binary-coded. (📖MELSEC iQ-F FX5 User's Manual (Communication))
- If the set number of device points is out of the range, o_bErr (error completion) is turned on, and the processing of FB is suspended. Also, the error code 100H (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 176 Error code.
- If an error occurs during device data read, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 176 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the requested module I/O No. (M_FX5CCLGNMS_SLMP_DeviceRead_IP_00A_1.pbi_uRequestModuleIO).

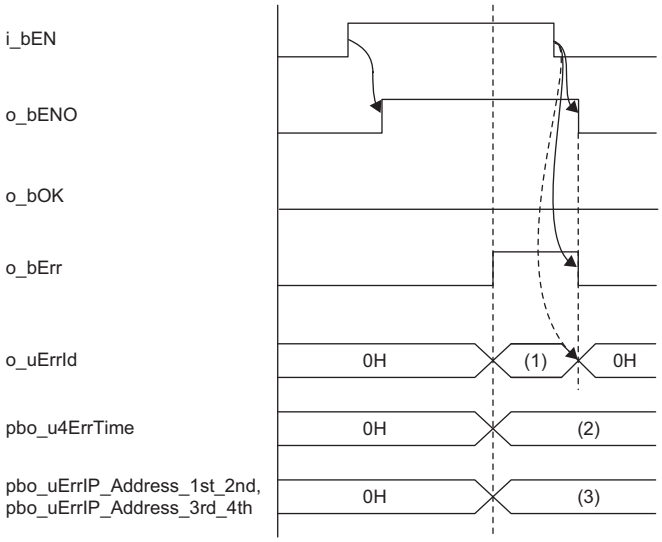


Timing chart of I/O signals

■For normal completion

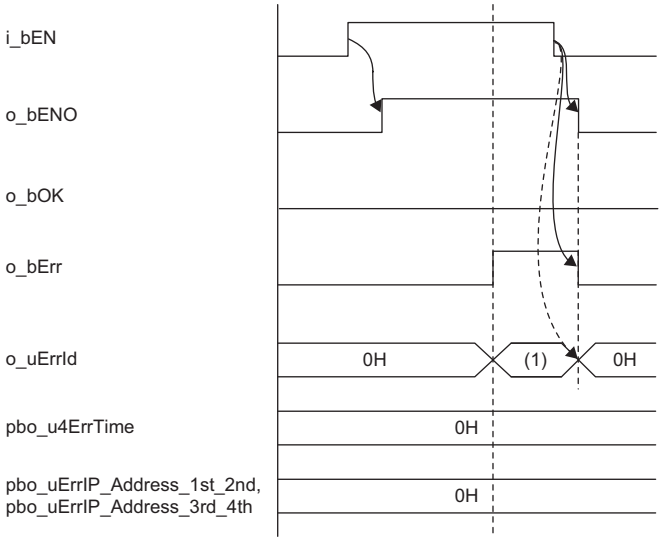


■For error completion (when a dedicated instruction is completed with an error)



(1) Error code
(2) Error occurrence time
(3) Error-detected station IP address

■For error completion (when a dedicated instruction is normally completed but the end code is issued with an error)



(1) Error code

Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.SLMPSND instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB uses the GP.SLMPSND instruction. The GP.SLMPSND instruction will be normally completed even if an abnormal response is returned from the target device. This FB judges the normal completion/error completion from the end code of the response frame. Therefore, when the error completion is judged from the end code, the end code is stored as the output label end code.
- When the GP.SLMPSND instruction is normally completed, the error occurrence time, error-detected device IP address (1st and 2nd octets), and error-detected device IP address (3rd and 4th octets) of the public variables do not store values. *1
- The constants are set to a part of the setting data as follows in the GP.SLMPSND instruction used in this FB.

Data range	Device	Item	Constant set by FB
Control data	(s1) + 0	Execution or error completion type	0081H
	(s1) + 6	Request destination network number	0000H
	(s1) + 7	Request destination station number	00FFH
	(s1) + 9	Request destination multidrop number	0000H
Request data	(s2) + 1	Monitoring timer	K2
	(s2) + 2	Command	0401H (Read)

- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, access devices (such as link direct device) that are accessed by the extension specification of SLMP cannot be read.
- In this FB, stations in other network cannot be set as the target station.
- For the port of target device where the remote password is set, execute this FB after performing the unlock processing of the remote password. When this FB is executed for the port of target device where the remote password is set, an error will occur.

- The target station must support "Device Read (Batch) (command: 0401H)" of 3E frame command.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses UDP communications. Set the protocol setting of the target device to UDP.
- Every input must be provided with a value for proper FB operation.
- When executing this FB from the first scan, set values for all public variables (operation parameters) in advance.

*1 When 0 (default value) is stored in the error occurrence time, error-detected station IP address (1st and 2nd octets), and error-detected station IP address (3rd and 4th octets), refer to the manual for the SLMP-compatible device used and take appropriate actions.

Parameter setting

No parameters are required to use this FB.

Example of use

For an example of use, refer to ☞ Page 286 EXAMPLE OF USE.

Performance value

CPU module	Measurement conditions*3	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Number of device points to read: K1	6.810ms	0.915ms	20 scans
	Number of device points to read: K960	8.310ms	1.850ms	21 scans
FX5U, FX5UC*1*2	Number of device points to read: K1	10.200ms	0.734ms	24 scans
	Number of device points to read: K960	12.600ms	1.550ms	28 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.
*3 The written data is K1234.

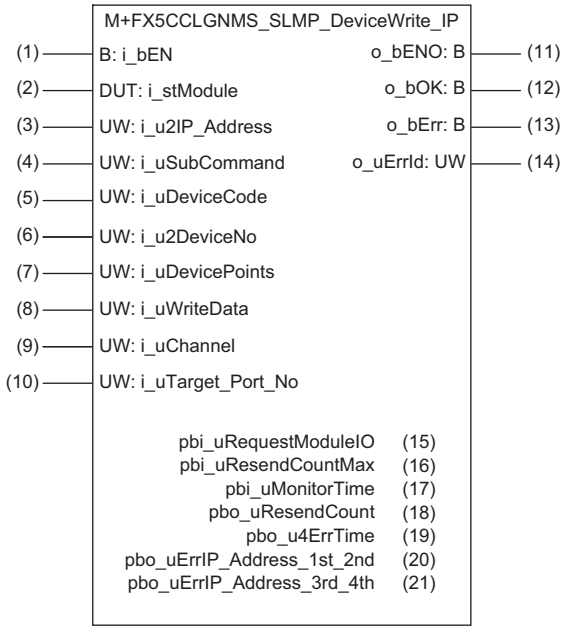
Error code

Error code (hexadecimal)	Description	Action
100H	When the read unit is 0 (in units of words), a value other than 1 to 960 was specified. When the read unit is 1 (in units of bits), a value other than 1 to 3972 was specified.	After reviewing the setting, re-execute the FB.
Error code other than 100H	Same as the error code caused by the SLMP frame sending (GP.SLMPSND) instruction.	Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/ Local Module User's Manual.

3.7 M+FX5CCLGNMS_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device)

Overview

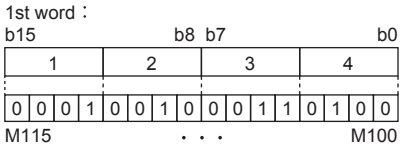
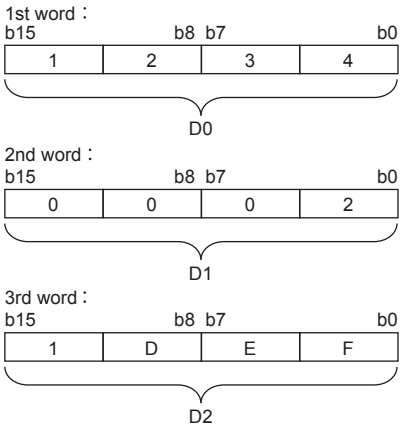
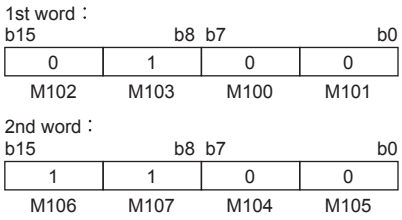
This FB writes device data to the SLMP-compatible device by specifying IP address.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.
(3)	i_u2IP_Address	IP address of target device	Word [Unsigned]/Bit String [16-bit] (0..1)	0.0.0.1 to 223.255.255.254	Specify the IP address of target device. Specify a value in the range of 1 to 254 (FEH) for the fourth octet. b15 b8 b7 b0 1st word: First octet / Third octet 2nd word: Second octet / Fourth octet
(4)	i_uSubCommand	Sub command	Word [Unsigned]/Bit String [16-bit]	0 to 3	Specify the write unit and specification method of a device. ■0th bit Specify whether the device is written in units of words or in units of bits. • 0: In units of words • 1: In units of bits ■1st bit Specify the combination of the number of digits of the device code and start device number of the device to be written. • 0: Specify the device code in 2 digits and the start device number in 6 digits. • 1: Specify the device code in 4 digits and the start device number in 8 digits.*1

No.	Variable name	Name	Data type	Range	Description
(5)	i_uDeviceCode	Device code	Word [Unsigned]/Bit String [16-bit]	—	Specify the device code of the device to be written in binary code. • When the 1st bit of the subcommand is 0: 2 digits • When the 1st bit of the subcommand is 1: 4 digits
(6)	i_u2DeviceNo	Head device No.	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the start device number of the device to be written in binary code. • When the 1st bit of the subcommand is 0: 2 digits • When the 1st bit of the subcommand is 1: 4 digits
(7)	i_uDevicePoints	Number of device points	Word [Unsigned]/Bit String [16-bit]	1 to 960, 1 to 3972	Specify the number of device points of the device to be written in binary code. • When the 0th bit of the subcommand is 0: 1 to 960 digits • When the 0th bit of the subcommand is 1: 1 to 3972 digits*2
(8)	i_uWriteData	Write data storage destination	Word [Unsigned]/Bit String [16-bit]	—	Specify the start device number of the device for storing the write data. • When the 0th bit of the subcommand is 0, the device data is written in units of words. Example: When writing the bit device M100 to M115 (one word) in units of words  Example: When writing the word device D0 to D2 in units of words  • When the 0th bit of the subcommand is 1, the device data is written in units of bits. Example: When writing the bit device M100 to M107 in units of bits 
(9)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1 to 17	Specify the channel to be used by own station according to the communication content. 1: Do not add serial number. 2 to 9: Add serial number. 10 to 17: Communicate using station number extension frame.
(10)	i_uTarget_Port_No	Destination port number	Word [Unsigned]/Bit String [16-bit]	1 to 65534	Specify the UDP port number of target device. For the port number to be specified, refer to the manual for the target device.

*1 It can be specified when the target device for reading is MELSEC iQ-R Series. It cannot be specified when the target device for reading is MELSEC-Q/L Series or MELSEC iQ-F Series.

*2 The allowable range is 1 to 3584 when the target device for reading is MELSEC iQ-F Series.

Output label

No.	Variable name	Name	Data type	Default value	Description
(11)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(12)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the device has been written correctly.
(13)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(14)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.

Operation parameter

No.	Variable name	Name	Data type	Range	Description
(15)	pbi_uRequestModuleIO	Requested module I/O No.	Word [Unsigned]/Bit String [16-bit]	03FFH, 03E0H to 03E3H, 03D0H to 03D3H	Specify the module of the access destination. • 03FFH: Own station, control CPU • 03E0H: Multiple CPU No.1 • 03E1H: Multiple CPU No.2 • 03E2H: Multiple CPU No.3 • 03E3H: Multiple CPU No.4 • 03D0H: Control system CPU • 03D1H: Standby system CPU • 03D2H: System A CPU • 03D3H: System B CPU
(16)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(17)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in "maximum number of resends" is reached. • 0: 10 seconds • 1 to 32767: 1 to 32767 seconds

Public variable

No.	Variable name	Name	Data type	Range	Description
(18)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	The number of resends performed (result) is stored. When an error is detected, the number of resends performed (results) between the detection of the error to stopping of resending is stored.
(19)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored.*1 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Year (00H to 99H) (Last 2 digits of the year) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Year (00H to 99H) (Upper 2 digits of the year) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(20)	pbo_uErrIP_Address_1st_2nd	Error-detected station IP address (1st and 2nd octets)	Word [Unsigned]/Bit String [16-bit]	—	The IP address (first octet, second octet) of the device in which an error was detected is stored.*1 Example: For 192.168.1.2 C0A8H
(21)	pbo_uErrIP_Address_3rd_4th	Error-detected station IP address (3rd and 4th octets)	Word [Unsigned]/Bit String [16-bit]	—	The IP address (third octet, fourth octet) of the device in which an error was detected is stored.*1 Example: For 192.168.1.2 0102H

*1 The value is stored only when a dedicated instruction is completed with an error.
The error-detected station IP address (1st and 2nd octets) and error-detected station IP address (3rd and 4th octets) store values set as the IP address of target device of the input argument.

FB details

Available device

■CC-Link IE TSN module

Target module	Firmware version	Engineering tool
FX5-CCLGN-MS	1.020 or later	GX Works3 Version 1.105K or later

■CPU module

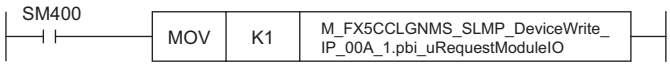
Target module	Firmware version	Engineering tool
FX5UJ	1.070 or later	GX Works3 Version 1.105K or later
FX5U, FX5UC	1.300 or later	GX Works3 Version 1.105K or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	460 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 1060 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed type (multiple scan execution type)

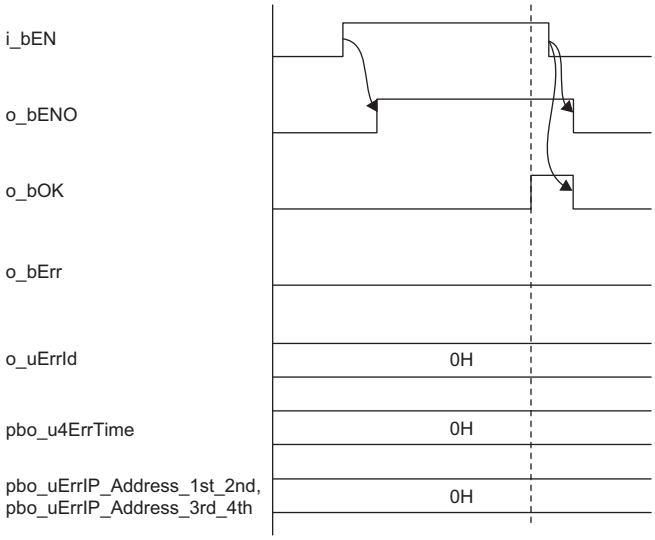
Processing

- When i_bEN (start condition) is turned on, this function writes device data of the SLMP-compatible device.
- Before executing this FB, specify the IP address of target device.
- This FB uses "Device Write (command: 1401H)" of SLMP. SLMP command messages are binary-coded. (📖MELSEC iQ-F FX5 User's Manual (Communication))
- If the set number of device points is out of the range, o_bErr (error completion) is turned on, and the processing of FB is suspended. Also, the error code 100H (hexadecimal) is stored in o_uErrId (error code). For the error code, refer to ☞ Page 184 Error code.
- If an error occurs during device data writing, o_bErr (error completion) is turned on, and the error code is stored in o_uErrId (error code). For the error code, refer to ☞ Page 184 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label as "FB instance"."public label". The following program is designed to assign K1 to the requested module I/O No. (M_FX5CCLGNMS_SLMP_DeviceWrite_IP_00A_1.pbi_uRequestModuleIO).

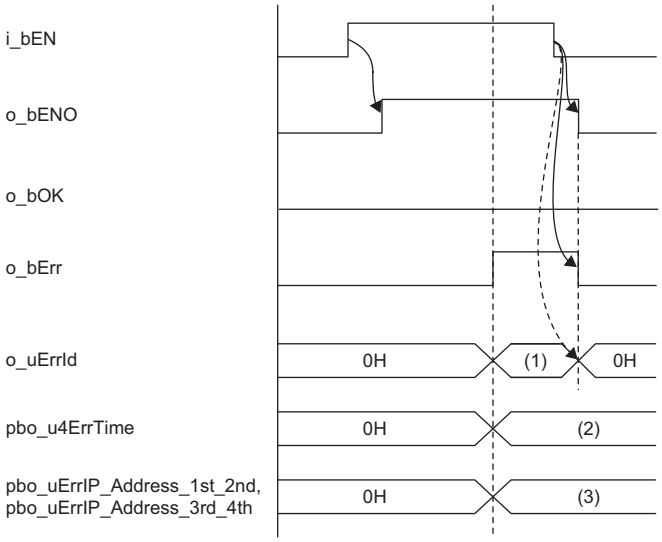


Timing chart of I/O signals

■For normal completion

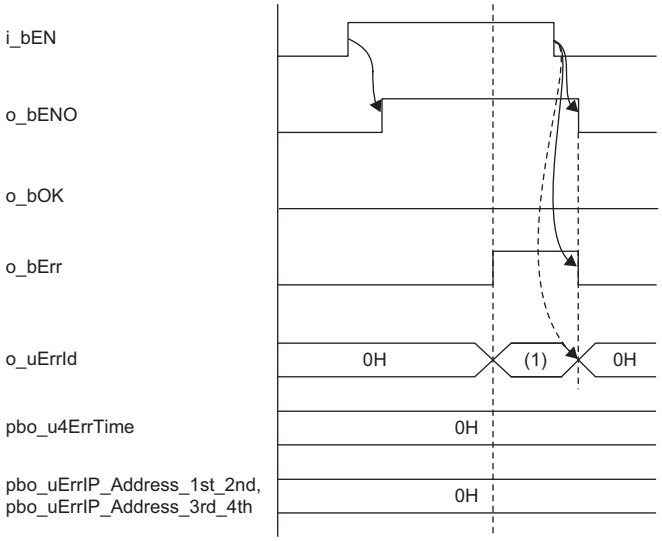


■For error completion (when a dedicated instruction is completed with an error)



(1) Error code
(2) Error occurrence time
(3) Error-detected station IP address

■For error completion (when a dedicated instruction is normally completed but the end code is issued with an error)



(1) Error code

Restrictions or precautions

- This FB does not include the error recovery processing. Program the error processing separately in accordance with the system and the required operation.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.SLMPSND instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB uses the GP.SLMPSND instruction. The GP.SLMPSND instruction will be normally completed even if an abnormal response is returned from the target device. This FB judges the normal completion/error completion from the end code of the response frame. Therefore, when the error completion is judged from the end code, the end code is stored as the output label end code.
- When the GP.SLMPSND instruction is normally completed, the error occurrence time, error-detected device IP address (1st and 2nd octets), and error-detected device IP address (3rd and 4th octets) of the public variables do not store values. *1
- The constants are set to a part of the setting data as follows in the GP.SLMPSND instruction used in this FB.

Data range	Device	Item	Constant set by FB
Control data	(s1) + 0	Execution or error completion type	0081H
	(s1) + 6	Request destination network number	0000H
	(s1) + 7	Request destination station number	00FFH
	(s1) + 9	Request destination multidrop number	0000H
Request data	(s2) + 1	Monitoring timer	K2
	(s2) + 2	Command	1401H (Write)

- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- In this FB, access devices (such as link direct device) that are accessed by the extension specification of SLMP cannot be written.
- In this FB, stations in other network cannot be set as the target station.
- For the port of target device where the remote password is set, execute this FB after performing the unlock processing of the remote password. When this FB is executed for the port of target device where the remote password is set, an error will occur.

- The target station must support "Device Write (Batch) (command: 1401H)" of 3E frame command.
- This FB is for communications in binary code only. (Communications using ASCII code cannot be performed.)
- This FB uses UDP communications. Set the protocol setting of the target device to UDP.
- Every input must be provided with a value for proper FB operation.
- When executing this FB from the first scan, set values for all public variables (operation parameters) in advance.

*1 When 0 (default value) is stored in the error occurrence time, error-detected station IP address (1st and 2nd octets), and error-detected station IP address (3rd and 4th octets), refer to the manual for the SLMP-compatible device used and take appropriate actions.

Parameter setting

No parameters are required to use this FB.

Example of use

For an example of use, refer to ☞ Page 286 EXAMPLE OF USE.

Performance value

CPU module	Measurement conditions*3	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Number of device points to read: K1	10.100ms	2.550ms	5 scans
	Number of device points to read: K960	11.200ms	3.310ms	6 scans
FX5U, FX5UC*1*2	Number of device points to read: K1	10.900ms	2.700ms	6 scans
	Number of device points to read: K960	12.800ms	2.880ms	6 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.
*3 The written data is K1234.

Error code

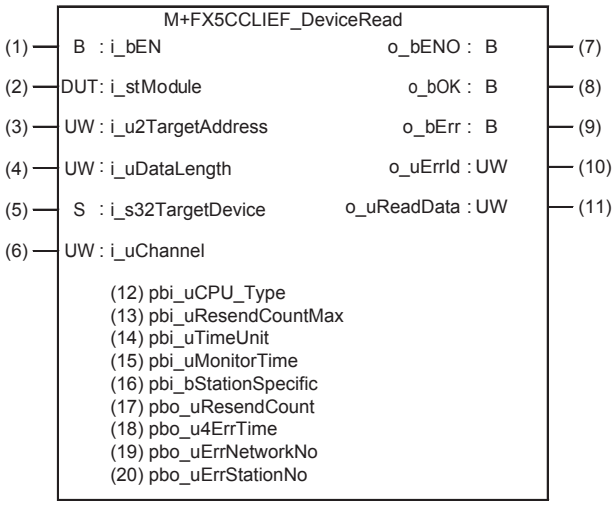
Error code (hexadecimal)	Description	Action
100H	When the read unit is 0 (in units of words), a value other than 1 to 960 was specified. When the read unit is 1 (in units of bits), a value other than 1 to 3972 was specified.	After reviewing the setting, re-execute the FB.
Error code other than 100H	Same as the error code caused by the SLMP frame sending (GP.SLMPSND) instruction.	Refer to the MELSEC iQ-F FX5 CC-Link IE TSN Master/ Local Module User's Manual.

4 FB FOR CC-Link IE Field Network

4.1 M+FX5CCLIEF_DeviceRead (Reading of another station device)

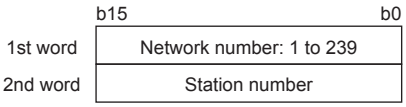
Overview

This FB reads data from a specified device in the programmable controller of another station.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.
(3)	i_u2TargetAddress	Target station address	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the network number and station number for the target station. To specify with a label, use an array for the data type.  Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 126: Master operating station • 1 to 120: Local station, remote device station, intelligent device station, submaster station
(4)	i_uDataLength	Read data length	Word [Unsigned]/Bit String [16-bit]	1 to 960	Specify the number of words to be read. • When reading data from RCPU, QCPU, LCPU, or FX5CPU: 1 to 960 • When reading data from QnACPU: 1 to 480
(5)	i_s32TargetDevice	Target station read device	Character string (32)	—	Specify the head device of the target station from which data is to be read. Refer to the MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual for details on specifying the device.
(6)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Specify the channel to be used by own station.

Output label

No.	Variable name	Name	Data type	Default value	Description
(7)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(8)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the device has been read out correctly.
(9)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(10)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.
(11)	o_uReadData	Read data storage device	Word [Unsigned]/Bit String [16-bit]	0	Specify the start number of the device for storing the read data.

Public label

No.	Variable name	Name	Data type	Range	Description
(12)	pbi_uCPU_Type	Target station CPU type	Word [Unsigned]/Bit String [16-bit]	0000H, 03D0H to 03D3H, 03E0H to 03E3H, 03FFH	Specify the CPU type of the target station. • 0000H: To CPU of target station (control CPU) • 03D0H: To control system CPU • 03D1H: To standby system CPU • 03D2H: To system A CPU • 03D3H: To system B CPU • 03E0H: To multiple CPU No.1 • 03E1H: To multiple CPU No.2 • 03E2H: To multiple CPU No.3 • 03E3H: To multiple CPU No.4 • 03FFH: To CPU of target station (control CPU)
(13)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(14)	pbi_uTimeUnit	Arrival monitoring time unit	Word [Unsigned]/Bit String [16-bit]	—	This label is not used in the FB program and does not need to be set.
(15)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in "maximum number of resends" is reached. • 0: 10s • 1 to 32767: 1 to 32767s
(16)	pbi_bStationSpecific	Target station address specification method	Bit	—	This label is not used in the FB program and does not need to be set.
(17)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	The number of resends performed (result) is stored.
(18)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Lower 2 digits of year (00H to 99H) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Upper 2 digits of year (00H to 99H) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(19)	pbo_uErrNetworkNo	Error detection network number	Word [Unsigned]/Bit String [16-bit]	—	The network number of the station in which an error was detected is stored.
(20)	pbo_uErrStationNo	Error-detected station number	Word [Unsigned]/Bit String [16-bit]	—	The station number of the station in which an error was detected is stored. Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 1 to 120: Local station, remote device station, intelligent device station, submaster station

FB details

Available device

■CC-Link IE Field Network module

Target module	Firmware version	Engineering tool
FX5-CCLIEF	—	GX Works3 Version 1.025B or later

■CPU module

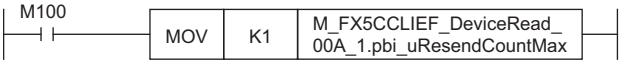
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

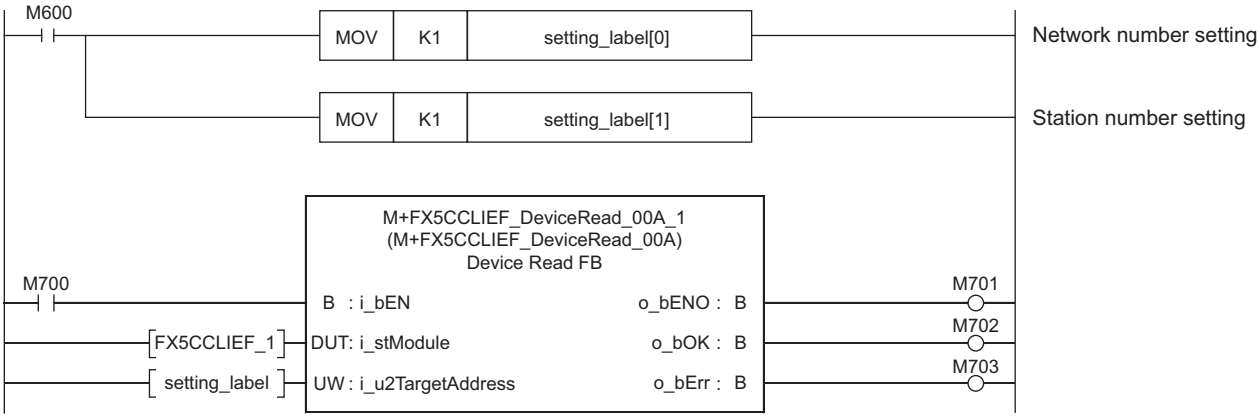
Item	Description
Language	Ladder diagram
Number of steps	113 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.05K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

- When i_bEN (Execution command) is turned on, data corresponding to the read data length is read from the read device of the specified target station address.
- If an error occurs during device read, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 190 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the 📖MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label with "FB instance". "public label". The following program is designed to assign K1 to the maximum number of resends (M_FX5CCLIEF_DeviceRead_00A_1.pbi_uResendCountMax) to set the number of resends to be performed if the transmission is not completed within the monitoring time specified in the arrival monitoring time.

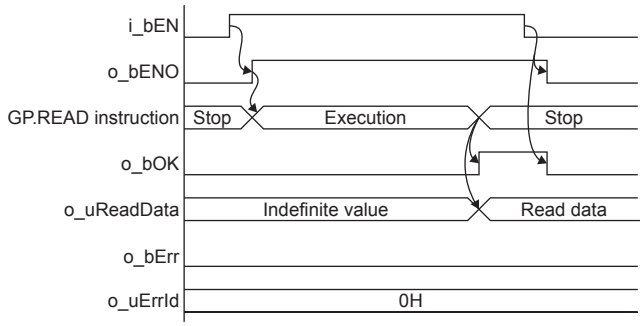


- Since the i_u2TargetAddress (Target station address) data type is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set that label value in i_u2TargetAddress (Target station address). The following program is designed to set the network No.1 (K1) of the target station in the global label setting_label[0] and set the station No.1 (K1) of Ethernet or CC-Link IE Controller Network in setting_label[1] and i_u2TargetAddress (target station address).



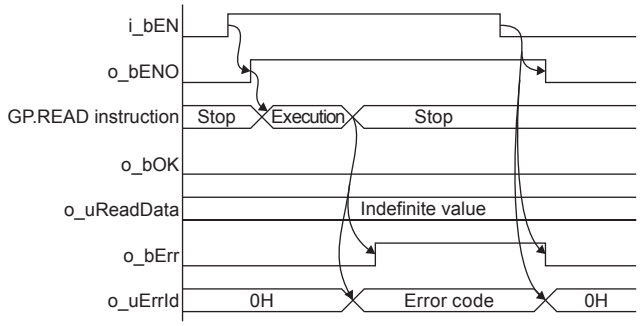
Timing chart of I/O signals

■For normal completion



■For error completion

For instruction error



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.READ instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.READ instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label as needed.

Parameter setting

For CC-Link IE Field Network settings, set the parameters on GX Works3.

Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-CCLIEF]

For details on the setting procedure, refer to the MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Read data length: 1 word	19.6ms	1.31ms	23 scans
	Read data length: 960 words	24.7ms	1.87ms	28 scans
FX5U, FX5UC*1*2	Read data length: 1 word	17.5ms	1.01ms	27 scans
	Read data length: 960 words	23.1ms	1.60ms	27 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.

*2 The labels in the standard area are used.

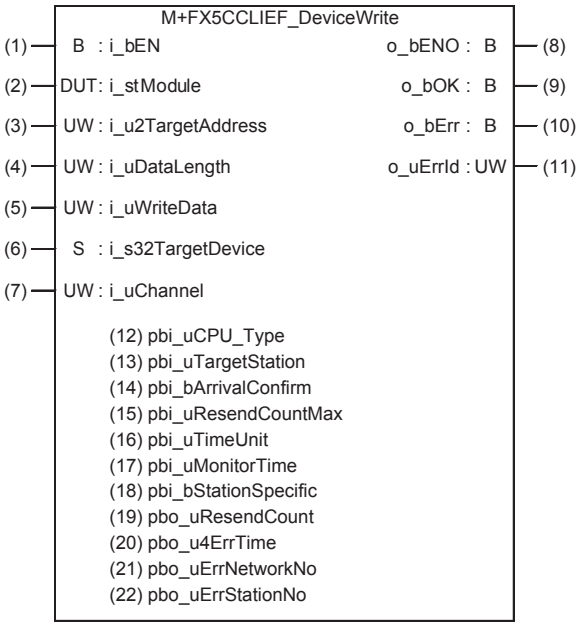
Error code

Error code (hexadecimal)	Description	Action
D000H to DFFFH	This error code is the same as the error code that occurs with the (GP.READ) instruction for reading data in the programmable controller of another station.	Refer to the MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

4.2 M+FX5CCLIEF_DeviceWrite (Writing to another station device)

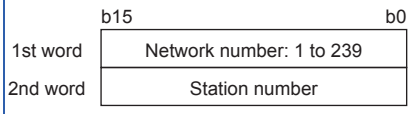
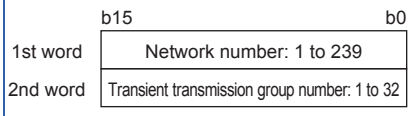
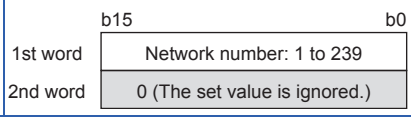
Overview

This FB writes data to a specified device in the programmable controller of another station.



Labels

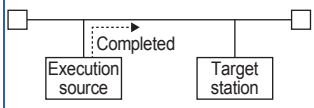
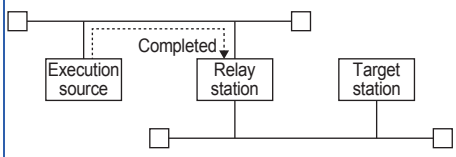
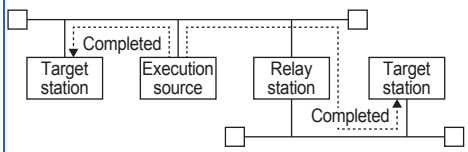
Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.
(3)	i_u2TargetAddress	Target station address	Word [Unsigned]/Bit String [16-bit] (0..1)	—	Specify the network number and station number for the target station. To specify with a label, use an array for the data type. ■When "target station specification method" is set to 0 to specify a station number  Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 126: Master operating station • 1 to 120: Local station, remote device station, intelligent device station, submaster station ■When "target station specification method" is set to 1 to specify a group  ■When "target station specification method" is set to 2 to specify all stations 
(4)	i_uDataLength	Write data length	Word [Unsigned]/Bit String [16-bit]	1 to 960	Specify the number of words to be written. • When reading data from RCPU, QCPU, LCPU, or FX5CPU: 1 to 960 • When reading data from QnACPU: 1 to 480
(5)	i_uWriteData	Write data storage device	Word [Unsigned]/Bit String [16-bit]	—	Specify the head device of own station containing the write data.
(6)	i_s32TargetDevice	Target station write device	Character string (32)	—	Specify the head device of the target station to which data is to be written. Refer to the MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual for details on specifying the device.
(7)	i_uChannel	Own station channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Specify the channel to be used by own station.

Output label

No.	Variable name	Name	Data type	Default value	Description
(8)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(9)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the device has been written correctly.
(10)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(11)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	The error code that occurred in the FB is stored.

Public label

No.	Variable name	Name	Data type	Range	Description
(12)	pbi_uCPU_Type	Target station CPU type	Word [Unsigned]/Bit String [16-bit]	0000H, 03D0H to 03D3H, 03E0H to 03E3H, 03FFH	Specify the CPU type of the target station. • 0000H: To CPU of target station (control CPU) • 03D0H: To control system CPU • 03D1H: To standby system CPU • 03D2H: To system A CPU • 03D3H: To system B CPU • 03E0H: To multiple CPU No.1 • 03E1H: To multiple CPU No.2 • 03E2H: To multiple CPU No.3 • 03E3H: To multiple CPU No.4 • 03FFH: To CPU of target station (control CPU)
(13)	pbi_uTargetStation	Target station specification method	Word [Unsigned]/Bit String [16-bit]	0 to 2	Specify the target station specification method. • 0: Station number specification → Station with the station number specified in "target station address" • 1: Group specification → All stations with the transient transmission group number specified with "target station address specification" • 2: All stations → All stations with the network number specified with "target station address specification" (Broadcast simultaneously to all stations excluding own station) Group specification cannot be used when the target group is CC-Link IE Field Network. Group specification and All station specification can be specified only when "Arrival acknowledgment" = Off (None). When using Group specification or All station specification, set the CPU type of the target station to "0000H" or "03FFH".
(14)	pbi_bArrivalConfirm	Arrival acknowledgment	Bit	On, off	Specify whether to use arrival acknowledgment. ■Off: None • When the target station is within the own network, sending data from the own station completes the sending.  • When the target station is within another network, data arrival to the relay station within the own network completes the sending.  ■On: Check • Sending data is completed when the data is written to the target station. 
(15)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(16)	pbi_uTimeUnit	Arrival monitoring time unit	Word [Unsigned]/Bit String [16-bit]	—	This label is not used in the FB program and does not need to be set.

No.	Variable name	Name	Data type	Range	Description
(17)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in "maximum number of resends" is reached. • 0: 10s • 1 to 32767: 1 to 32767s
(18)	pbi_bStationSpecific	Target station address specification method	Bit	—	This label is not used in the FB program and does not need to be set.
(19)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	The number of resends performed (result) is stored.
(20)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Lower 2 digits of year (00H to 99H) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Upper 2 digits of year (00H to 99H) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(21)	pbo_uErrNetworkNo	Error detection network number	Word [Unsigned]/Bit String [16-bit]	—	The network number of the station in which an error was detected is stored.
(22)	pbo_uErrStationNo	Error-detected station number	Word [Unsigned]/Bit String [16-bit]	—	The station number of the station in which an error was detected is stored. Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 1 to 120: Local station, remote device station, intelligent device station, submaster station

FB details

Available device

■CC-Link IE Field Network module

Target module	Firmware version	Engineering tool
FX5-CCLIEF	—	GX Works3 Version 1.025B or later

■CPU module

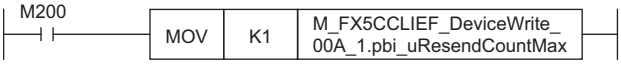
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

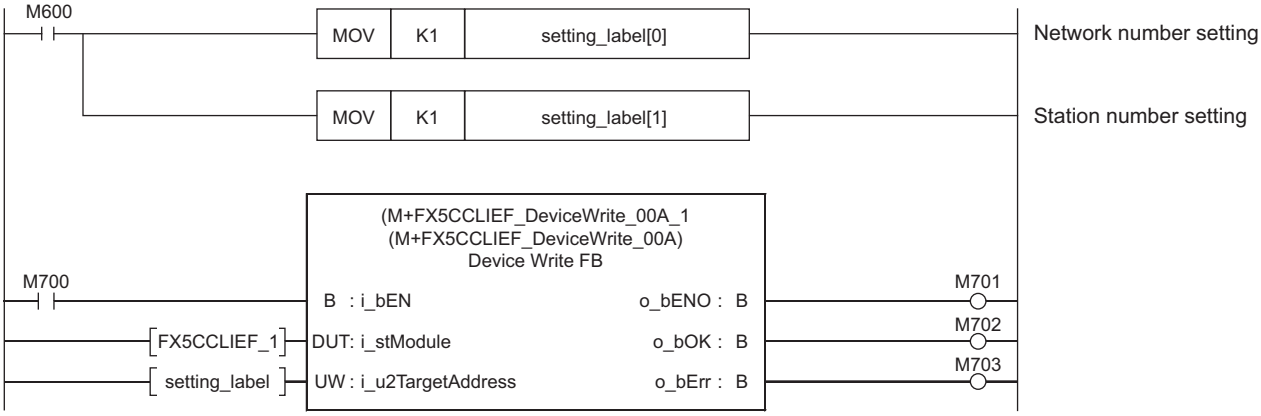
Item	Description
Language	Ladder diagram
Number of steps	136 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.05K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

- When i_bEN (Execution command) is turned on, data corresponding to the write data length is written from the device specified with the write data storage device into the target station write device of the specified target station address.
- If an error occurs during device write, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 197 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 190 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label with "FB instance". "public label". The following program is designed to assign K1 to the maximum number of resends (M_FX5CCLIEF_DeviceWrite_00A_1.pbi_uResendCountMax) to set the number of resends to be performed if the transmission is not completed within the monitoring time specified in the arrival monitoring time.

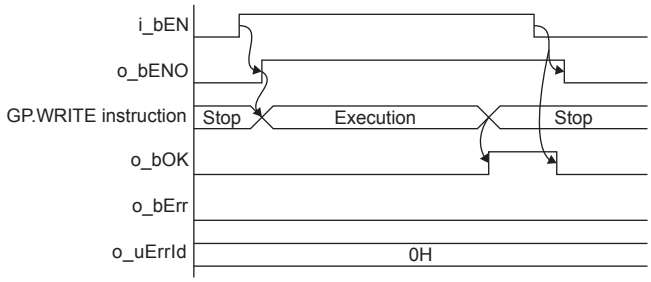


- Since the i_u2TargetAddress (Target station address) data type is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set that label value in i_u2TargetAddress (Target station address). For the setting procedure, refer to ☞ Page 185 M+FX5CCLIEF_DeviceRead (Reading of another station device).



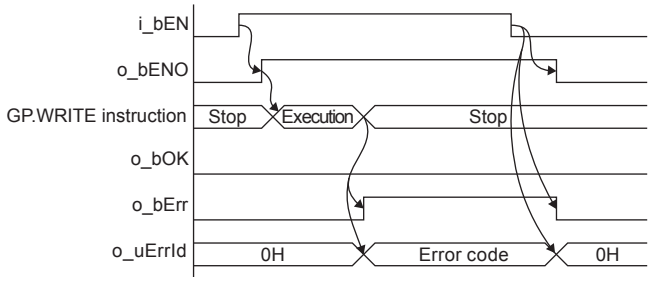
Timing chart of I/O signals

■For normal completion



■For error completion

For instruction error



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.WRITE instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.WRITE instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label as needed.

Parameter setting

For the parameter setting, refer to ☞ Page 190 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Write data length: 1 word	19.4ms	1.27ms	23 scans
	Write data length: 960 words	24.6ms	2.12ms	27 scans
FX5U, FX5UC*1*2	Write data length: 1 word	17.6ms	1.06ms	27 scans
	Write data length: 960 words	21.4ms	1.75ms	30 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

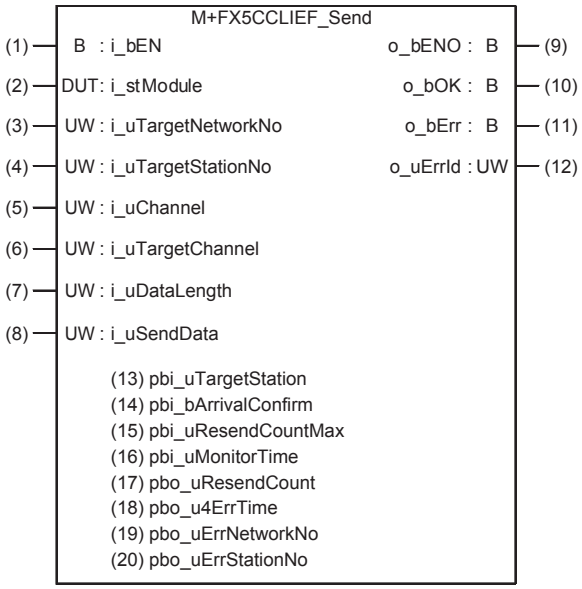
Error code

Error code (hexadecimal)	Description	Action
D000H to DFFFH	This error code is the same as the error code that occurs with the (GP.WRITE) instruction for writing data in the programmable controller of another station.	Refer to the 📖MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

4.3 M+FX5CCLIEF_Send (Sending of another station device)

Overview

This FB sends data to the programmable controller of another station.



Labels

Input label

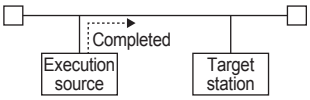
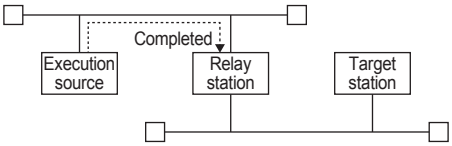
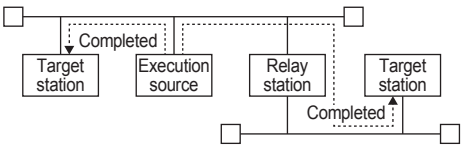
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.
(3)	i_uTargetNetworkNo	Target network number	Word [Unsigned]/ Bit String [16-bit]	1 to 239	Specify the network number of the target station.
(4)	i_uTargetStationNo	Target station number	Word [Unsigned]/ Bit String [16-bit]	—	Specify the station number of the target station or the transient transmission group number. ■When "target station specification method" is set to 0 to specify a station number Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 126: Master operating station • 1 to 120: Local station, remote device station, intelligent device station, submaster station ■When "target station specification method" is set to 1 to specify a group Specify the transient transmission group number • 1 to 32 ■When "target station specification method" is set to 2 to specify all stations The setting is ignored.
(5)	i_uChannel	Own station channel	Word [Unsigned]/ Bit String [16-bit]	1, 2	Specify the channel to be used by own station.
(6)	i_uTargetChannel	Target station data storage channel	Word [Unsigned]/ Bit String [16-bit]	1 to 8	Specify the channel of the target station for storing data. When the target station is a CC-Link IE Field Network master/local module, specify 1 or 2.

No.	Variable name	Name	Data type	Range	Description
(7)	i_uDataLength	Send data length	Word [Unsigned]/ Bit String [16-bit]	1 to 960	Specify the number of words to be sent. • When reading data from RCPU, QCPU, LCPU, or FX5CPU: 1 to 960 • When reading data from QnACPU: 1 to 480
(8)	i_uSendData	Send data storage device	Word [Unsigned]/ Bit String [16-bit]	—	Specify the head device of own station containing the send data.

Output label

No.	Variable name	Name	Data type	Default value	Description
(9)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(10)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the data has been sent correctly.
(11)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(12)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.

Public label

No.	Variable name	Name	Data type	Range	Description
(13)	pbi_uTargetStation	Target station specification method	Word [Unsigned]/Bit String [16-bit]	0 to 2	Specify the target station specification method. • 0: Station number specification → Station with the station number specified in "Target station number" • 1: Group specification → All stations with the transient transmission group number specified with "target station number" • 2: All stations → All stations with the network number specified with "target station network number" (Broadcast simultaneously to all stations excluding own station) Group specification cannot be used when the target group is CC-Link IE Field Network. Group specification and All station specification can be specified only when "Arrival acknowledgment" = Off (None).
(14)	pbi_bArrivalConfirm	Arrival acknowledgment	Bit	On, off	Specify whether to use arrival acknowledgment. ■Off: None • When the target station is within the own network, sending data from the own station completes the sending.  • When the target station is within another network, data arrival to the relay station within the own network completes the sending.  ■On: Check • Sending data is completed when the data is written to the target station. 

No.	Variable name	Name	Data type	Range	Description
(15)	pbi_uResendCountMax	Maximum number of resends	Word [Unsigned]/Bit String [16-bit]	0 to 15	Specify the number of resends to be performed if the data transfer is not completed within the monitoring time specified by "arrival monitoring time". • 0 to 15
(16)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, data is resent until the value specified in "maximum number of resends" is reached. • 0: 10s • 1 to 32767: 1 to 32767s
(17)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	The number of resends performed (result) is stored.
(18)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Lower 2 digits of year (00H to 99H) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Upper 2 digits of year (00H to 99H) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(19)	pbo_uErrNetworkNo	Error detection network number	Word [Unsigned]/Bit String [16-bit]	—	The network number of the station in which an error was detected is stored.
(20)	pbo_uErrStationNo	Error-detected station number	Word [Unsigned]/Bit String [16-bit]	—	The station number of the station in which an error was detected is stored. Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 1 to 120: Local station, remote device station, intelligent device station, submaster station

FB details

Available device

■CC-Link IE Field Network module

Target module	Firmware version	Engineering tool
FX5-CCLIEF	—	GX Works3 Version 1.025B or later

■CPU module

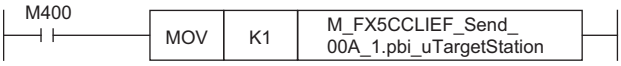
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	128 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Label usage	• Label: 0.04K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

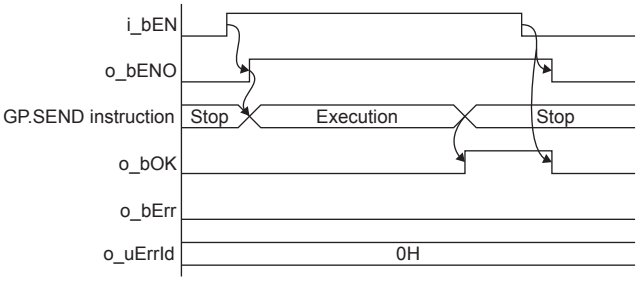
Processing

- When i_bEN (Execution command) is turned on, data corresponding to the send data length is sent from the send data storage device to the specified target station address.
- If an error occurs while sending data, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 203 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 190 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label with "FB instance". "public label". The following program is designed to assign K1 to the target station specification method (M_FX5CCLIEF_Send_00A_1.pbi_uTargetStation) to specify the monitoring time to the completion of processing.



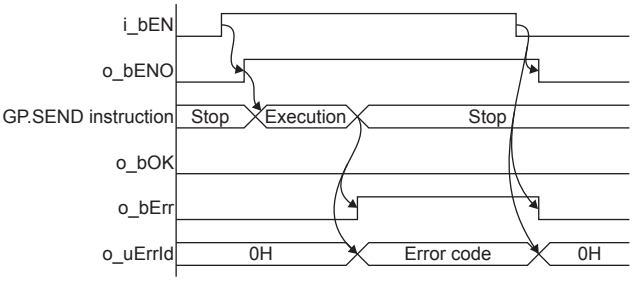
Timing chart of I/O signals

■For normal completion



■For error completion

For instruction error



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.SEND instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.SEND instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label as needed.

Parameter setting

For the parameter setting, refer to ☞ Page 190 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Operation check of target station network No.1	13.1ms	1.380ms	20 scans
FX5U, FX5UC*1*2	Operation check of target station network No.1	12.7ms	0.974ms	17 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

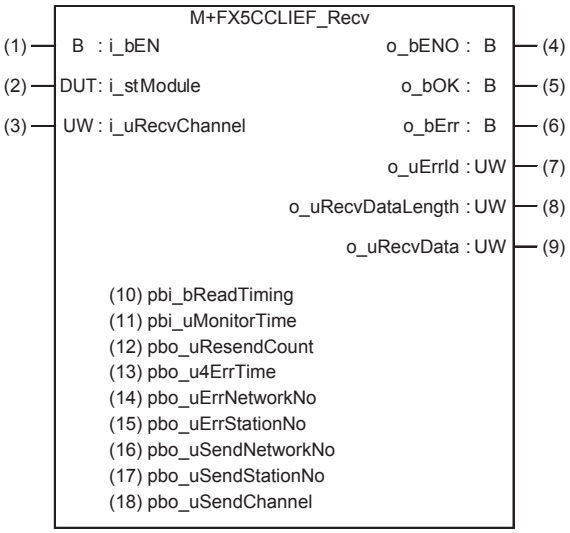
Error code

Error code (hexadecimal)	Description	Action
D000H to DFFFH	This error code is the same as the error code that occurs with the (GP.SEND) instruction for sending data to the programmable controller of another station.	Refer to the MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

4.4 M+FX5CCLIEF_Recv (Receiving of another station device)

Overview

This FB reads the data received from the programmable controller of another station.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.
(3)	i_uRecvChannel	Receive data storage channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Specify the channel containing the data to be read.

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that reading of the received data has completed normally.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	The error code that occurred in the FB is stored.
(8)	o_uRecvDataLength	Receive data length	Word [Unsigned]/ Bit String [16-bit]	0	The number of received data is stored. 1 to 960 words
(9)	o_uRecvData	Receive data storage device	Word [Unsigned]/ Bit String [16-bit]	0	Specify the start number of the device for storing received data.

Public label

No.	Variable name	Name	Data type	Range	Description
(10)	pbi_bReadTiming	Read timing	Bit	—	This label is not used in the FB program and does not need to be set. Data is read at the first END processing after the module FB is started.
(11)	pbi_uMonitorTime	Arrival monitoring time	Word [Unsigned]/Bit String [16-bit]	0, 1 to 32767	Specify the monitoring time until completion of processing. If the processing is not completed within the monitoring time, it will end with an error. • 0: 10s • 1 to 32767: 1 to 32767s
(12)	pbo_uResendCount	Number of resends	Word [Unsigned]/Bit String [16-bit]	—	This label is not used in the FB program and does not need to be set.
(13)	pbo_u4ErrTime	Error occurrence time	Word [Unsigned]/Bit String [16-bit] (0..3)	—	Clock data at the time of error occurrence is stored. 1st word • Upper 8 bits: Month (01H to 12H) • Lower 8 bits: Lower 2 digits of year (00H to 99H) 2nd word • Upper 8 bits: Hour (00H to 23H) • Lower 8 bits: Day (01H to 31H) 3rd word • Upper 8 bits: Second (00H to 59H) • Lower 8 bits: Minute (00H to 59H) 4th word • Upper 8 bits: Upper 2 digits of year (00H to 99H) • Lower 8 bits: Day of week (00H (Sunday) to 06H (Saturday))
(14)	pbo_uErrNetworkNo	Error detection network number	Word [Unsigned]/Bit String [16-bit]	—	The network number of the station in which an error was detected is stored.
(15)	pbo_uErrStationNo	Error-detected station number	Word [Unsigned]/Bit String [16-bit]	—	The station number of the station in which an error was detected is stored. Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 1 to 120: Local station, remote device station, intelligent device station, submaster station
(16)	pbo_uSendNetworkNo	Send station network number	Word [Unsigned]/Bit String [16-bit]	—	The network number of the send station is stored.
(17)	pbo_uSendStationNo	Send station number	Word [Unsigned]/Bit String [16-bit]	—	The station number of the send station is stored. Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 CC-Link IE Field Network station number • 125: Master station • 1 to 120: Local station, remote device station, intelligent device station, submaster station
(18)	pbo_uSendChannel	Channel used by send station	Word [Unsigned]/Bit String [16-bit]	1 to 8	The channel number used by the send station is stored.

FB details

Available device

■CC-Link IE Field Network module

Target module	Firmware version	Engineering tool
FX5-CCLIEF	—	GX Works3 Version 1.025B or later

■CPU module

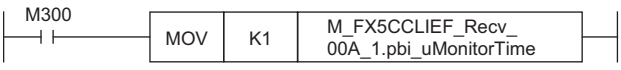
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	132 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.04K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

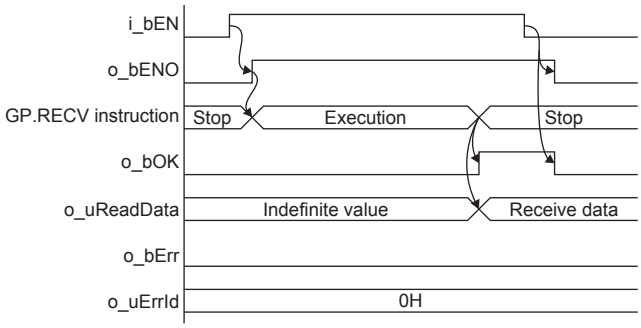
Processing

- When i_bEN (Execution command) is turned on, the received data is read from the specified received data storage channel and saved into the received data storage device.
- If an error occurs while receiving the data, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 208 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 190 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label with "FB instance". "public label". The following program is designed to assign K1 to the arrival monitoring time (M_FX5CCLIEF_Recv_00A_1.pbi_uMonitorTime) to specify the monitoring time to the completion of processing.



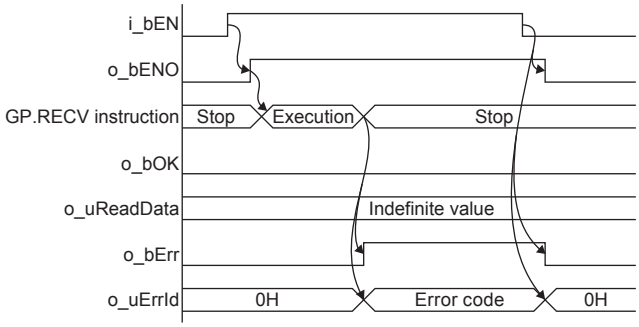
Timing chart of I/O signals

■For normal completion



■For error completion

For instruction error



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.RECV instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.RECV instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When using several of these FBs, ensure that the receive data storage channel do not overlap.
- Every input must be provided with a value for proper FB operation. Set the public label as needed.

Parameter setting

For the parameter setting, refer to ☞ Page 190 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Operation check of receive data storage channel 1	0.299ms	0.131ms	1 scan
FX5U, FX5UC*1*2	Operation check of receive data storage channel 1	0.009ms	1.780ms	1 scan

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

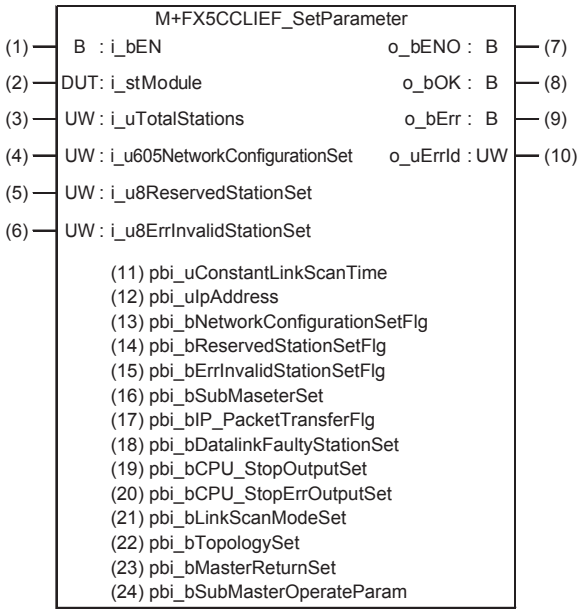
Error code

Error code (hexadecimal)	Description	Action
D000H to DFFFH	This error code is the same as the error code that occurs with the (GP.RECV) instruction for reading data received from the programmable controller of another station.	Refer to the MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

4.5 M+FX5CCLIEF_SetParameter (Parameter setting)

Overview

This FB sets parameters for a module.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.
(3)	i_uTotalStations	Total number of device stations	Word [Unsigned]/Bit String [16-bit]	—	This label is not used in the FB program and does not need to be set.
(4)	i_u605NetworkConfigurationSet	Network configuration setting data	Word [Unsigned]/Bit String [16-bit] (0..604)	—	
(5)	i_u8ReservedStationSet	Reserved station setting data	Word [Unsigned]/Bit String [16-bit] (0..7)	—	
(6)	i_u8ErrInvalidStationSet	Error invalid station setting data	Word [Unsigned]/Bit String [16-bit] (0..7)	—	

Output label

No.	Variable name	Name	Data type	Default value	Description
(7)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(8)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the parameters have been set correctly.
(9)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(10)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	The error code that occurred in the FB is stored.

Public label

No.	Variable name	Name	Data type	Range	Description
(11)	pbi_uConstantLinkScanTime	Constant link scan time	Word [Unsigned]/Bit String [16-bit]	—	This label is not used in the FB program and does not need to be set.
(12)	pbi_uIpAddress	Upper 2 digits of IP address	Word [Unsigned]/Bit String [16-bit]	—	
(13)	pbi_bNetworkConfigurationSetFlg	Presence of network configuration setting data	Bit	—	
(14)	pbi_bReservedStationSetFlg	Presence of reserved station specification data	Bit	—	
(15)	pbi_bErrInvalidStationSetFlg	Presence of error invalid station setting data	Bit	—	
(16)	pbi_bSubMaseterSet	Presence of submaster function	Bit	—	
(17)	pbi_bIP_PacketTransferFlg	Presence of IP packet transfer function	Bit	—	
(18)	pbi_bDatalinkFaultyStationSet	Data link faulty station setting	Bit	On, off	Specify whether to hold or clear the input data from a data link faulty station. • Off: Clear • On: Hold
(19)	pbi_bCPU_StopOutputSet	Output setting for CPU STOP	Bit	On, off	Specify whether to hold or clear the output data when the operating status of a CPU module is STOP. • Off: Hold • On: Clear
(20)	pbi_bCPU_StopErrOutputSet	Output setting for CPU stop error	Bit	On, off	Specify whether to hold or clear the output data when a CPU stop error has occurred in the CPU module. • Off: Clear • On: Hold
(21)	pbi_bLinkScanModeSet	Link scan mode setting	Bit	—	This label is not used in the FB program and does not need to be set.
(22)	pbi_bTopologySet	Network topology setting	Bit	—	
(23)	pbi_bMasterReturnSet	Master station return time operation setting	Bit	—	
(24)	pbi_bSubMasterOperateParam	Submaster station parameter operation setting	Bit	—	

FB details

Available device

■CC-Link IE Field Network module

Target module	Firmware version	Engineering tool
FX5-CCLIEF	—	GX Works3 Version 1.025B or later

■CPU module

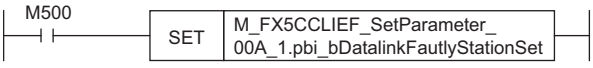
FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	92 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.63K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

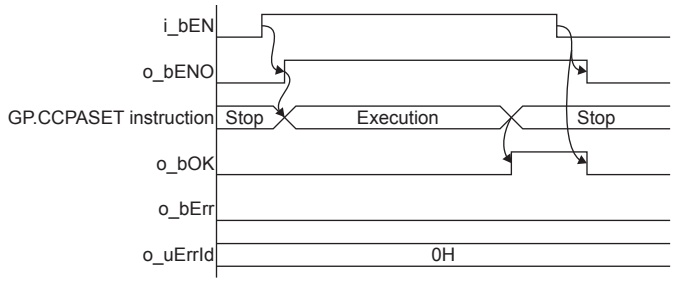
Processing

- When i_bEN (Execution command) is turned on, the parameters are set in the module.
- If an error occurs while setting the parameters, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 213 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 190 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Specify a public label with "FB instance". "public label". The following program is designed to turn on the data link faulty station setting (M_FX5CCLIEF_SetParameter_00A_1.pbi_bDatalinkFautlyStationSet).



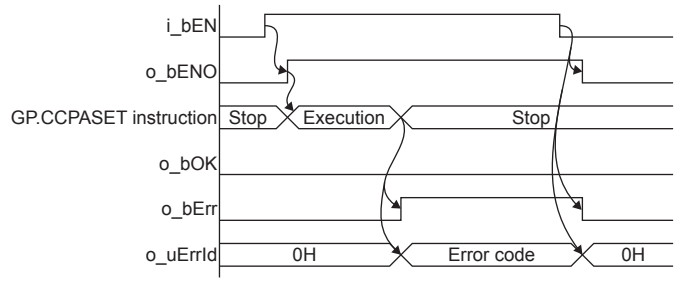
Timing chart of I/O signals

■For normal completion



■For error completion

For instruction error



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.CCPASET instruction. The module parameter "Parameter Setting Method" must be set to "Set with Program" to enable the GP.CCPASET instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.CCPASET instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).

Parameter setting

For the parameter setting, refer to ☞ Page 190 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Operation check when the data link faulty station setting is on	5.46ms	1.93ms	5 scans
FX5U, FX5UC*1*2	Operation check when the data link faulty station setting is on	11.10ms	1.66ms	12 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

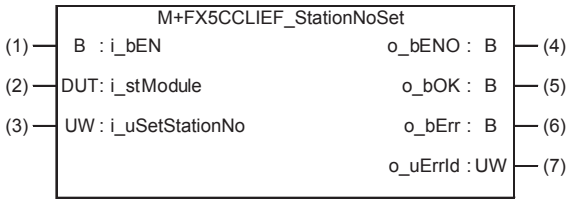
Error code

Error code (hexadecimal)	Description	Action
D000H to DFFFH	This error code is the same as the error code that occurs with the parameter set (GP.CCPASET) instruction.	Refer to the MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

4.6 M+FX5CCLIEF_StationNoSet (Own station number setting)

Overview

This FB sets the station number for the own station.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.
(3)	i_uSetStationNo	Setting station number	Word [Unsigned]/Bit String [16-bit]	1 to 120	Specify the station number to be set.

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that the station number has been set correctly.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	The error code that occurred in the FB is stored.

FB details

Available device

■CC-Link IE Field Network module

Target module	Firmware version	Engineering tool
FX5-CCLIEF	—	GX Works3 Version 1.025B or later

■CPU module

FX5UJ/FX5U/FX5UC CPU module

Basic specifications

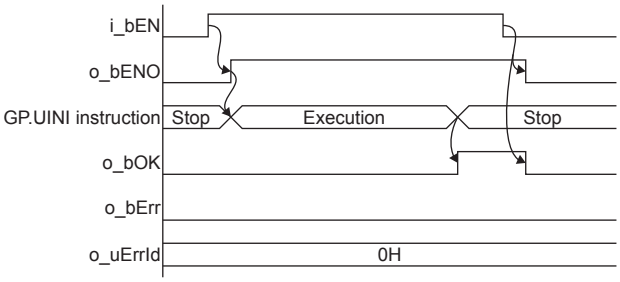
Item	Description
Language	Ladder diagram
Number of steps	77 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Label usage	• Label: 0.02K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

Processing

- When i_bEN (Execution command) is turned on, the number is set to the station number specified with the set station number.
- If an error occurs while setting the own station number, o_bErr (Error completion) turns on, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 216 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 190 Parameter setting.

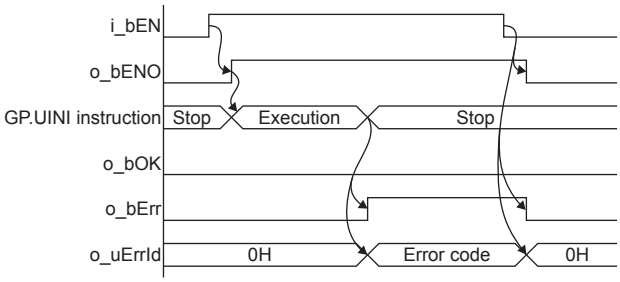
Timing chart of I/O signals

■For normal completion



■For error completion

For instruction error



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB uses the GP.UINI instruction. The module parameter "Station Setting Method" must be set to "Set with Program" to enable the GP.UINI instruction.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution command), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0. However, because the GP.UINI instruction which is a pulse instruction in the FB is used, if a write is performed while the FB is executed, the instruction may not be executed, and o_bOK (Normal completion) and o_bErr (Error completion) may not turn on. In that case, turn i_bEN (Execution command) on again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 190 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	Operation check of setting station No.1	8.36ms	1.170ms	9 scans
FX5U, FX5UC*1*2	Operation check of setting station No.1	10.30ms	0.916ms	12 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

Error code

Error code (hexadecimal)	Description	Action
D000H to DFFFH	This error code is the same as the error code that occurs with the own station number setting (GP.UINI) instruction.	Refer to the 📖MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

5 FB FOR EtherNet/IP (FX5-EIP)

This chapter describes the FBs dedicated to the FX5-EIP.
Up to one FX5-EIP can be connected. The module cannot be used with the FX5-ENET/IP.
For details, refer to the following.
MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

5.1 Specifications

When the FX5-EIP is used for any of the applications shown below, the corresponding FBs can be used.
○: Available, ×: Not available

FB	Originator	Target
M+FX5-EIP_Class1GetInputData	○	○
M+FX5-EIP_Class1SetOutputData	○	○

FB	Client	Server
M+FX5-EIP_UCMMOriginator_ReadTagData	○	×
M+FX5-EIP_UCMMOriginator_WriteTagData	○	×
M+FX5-EIP_Class3Originator_ReadTagData	○	×
M+FX5-EIP_Class3Originator_WriteTagData	○	×
M+FX5-EIP_UCMMOriginator_MessageSend	○	×
M+FX5-EIP_Class3Originator_MessageSend	○	×

Precautions

- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be performed. Always use this FB in programs that can turn off i_bEN (Execution command).
- Every input must be provided with a value for proper FB operation.
- Regarding the specification values of each FB, the time until the FB processing finishes varies depending on the factors such as the time required for processing of programs other than the relevant FB. Refer to the specification values as a guide for the processing time.
- The module FBs of this product do not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- Turn off i_bEN (Execution instruction) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning off i_bEN (Execution instruction), o_bOK (Normal completion) or o_bErr (Error completion) is turned off and o_uErrId (Error code) is cleared to 0.
- A device or label can be specified for the symbol of the module FB.
- The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the option setting of GX Works3.
- During input, it is recommended not to use this FB for connections for which auto refresh is enabled. If it is used, apart from the input data stored in the device specified as the output argument, the same input data will be set to the target device for auto refresh. During output, this FB cannot be used for connections for which auto refresh is enabled in "Refresh Setting" of GX Works3 module parameters. If it is used, integrity cannot be maintained in the data sent between the data of the device that is the target of auto refresh and i_uOutputData (output data storage device) specified as the input argument.
- The timing at which the obtained input data is updated is determined by the scan time of the program operating asynchronously, apart from the RPI setting. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- When assuring data such as the input and output data used in Class1 communications or Class3/UCMM communications, set 'Connection-unit block assurance specification' (Un\G232) to K16 (assure) before executing the FB. When using the auto refresh function, set the connection-unit block assurance specification to 0. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- Since the buffer memory areas are operated inside FBs using module labels, a double coil warning may occur at compilation if multiple FBs are used, but the warning does not affect the FBs.

Point

When a module FB is executed, an operation error may occur in the CPU module. In this case, check the detailed information of the operation error in event history and correct the input argument of the module FB.

Precautions on FB combinations

Multiple FBs of the FX5-EIP can be used at the same time by setting each FB to a different connection number.

The following shows whether the FBs can be used when set to the same connection number.

○: Can be set, ×Cannot be set

❶M+FX5-EIP_Class1GetInputData

❷M+FX5-EIP_Class1SetOutputData

❸M+FX5-EIP_UCMMOriginator_ReadTagData

❹M+FX5-EIP_UCMMOriginator_WriteTagData

❺M+FX5-EIP_Class3Originator_ReadTagData

❻M+FX5-EIP_Class3Originator_WriteTagData

❼M+FX5-EIP_UCMMOriginator_MessageSend

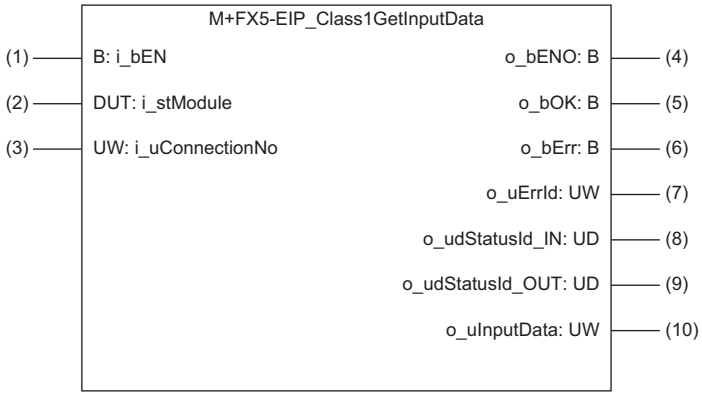
❽M+FX5-EIP_Class3Originator_MessageSend

—		Communication method							
		❶	❷	❸	❹	❺	❻	❼	❽
Communication method	❶	○	○	×	×	×	×	×	×
	❷	○	○	×	×	×	×	×	×
	❸	×	×	×	×	×	×	×	×
	❹	×	×	×	×	×	×	×	×
	❺	×	×	×	×	×	×	×	×
	❻	×	×	×	×	×	×	×	×
	❼	×	×	×	×	×	×	×	×
	❽	×	×	×	×	×	×	×	×

5.2 M+FX5-EIP_Class1GetInputData (Class1 communications input data acquisition)

Overview

Acquires input data of a specified connection through the Class1 communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	Only when the FB is activated	1 to 128	Specify the number of the connection where the input data is acquired. • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128

Output labels

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(5)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(8)	o_udStatusId_IN	Error code of connection communication error on the input side	Double word [unsigned]/bit string [32 bits]	0	An error code on the input side is stored when a connection communication error has occurred (when 200H is stored in o_uErrId).
(9)	o_udStatusId_OUT	Error code of connection communication error on the output side	Double word [unsigned]/bit string [32 bits]	0	An error code on the output side is stored when a connection communication error has occurred (when 200H is stored in o_uErrId).
(10)	o_uInputData	Input data storage device	Word [Unsigned]/ Bit String [16-bit]	0	Specifies the head number of the device where the input data is stored.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	726 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Label usage	• Label: 24 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

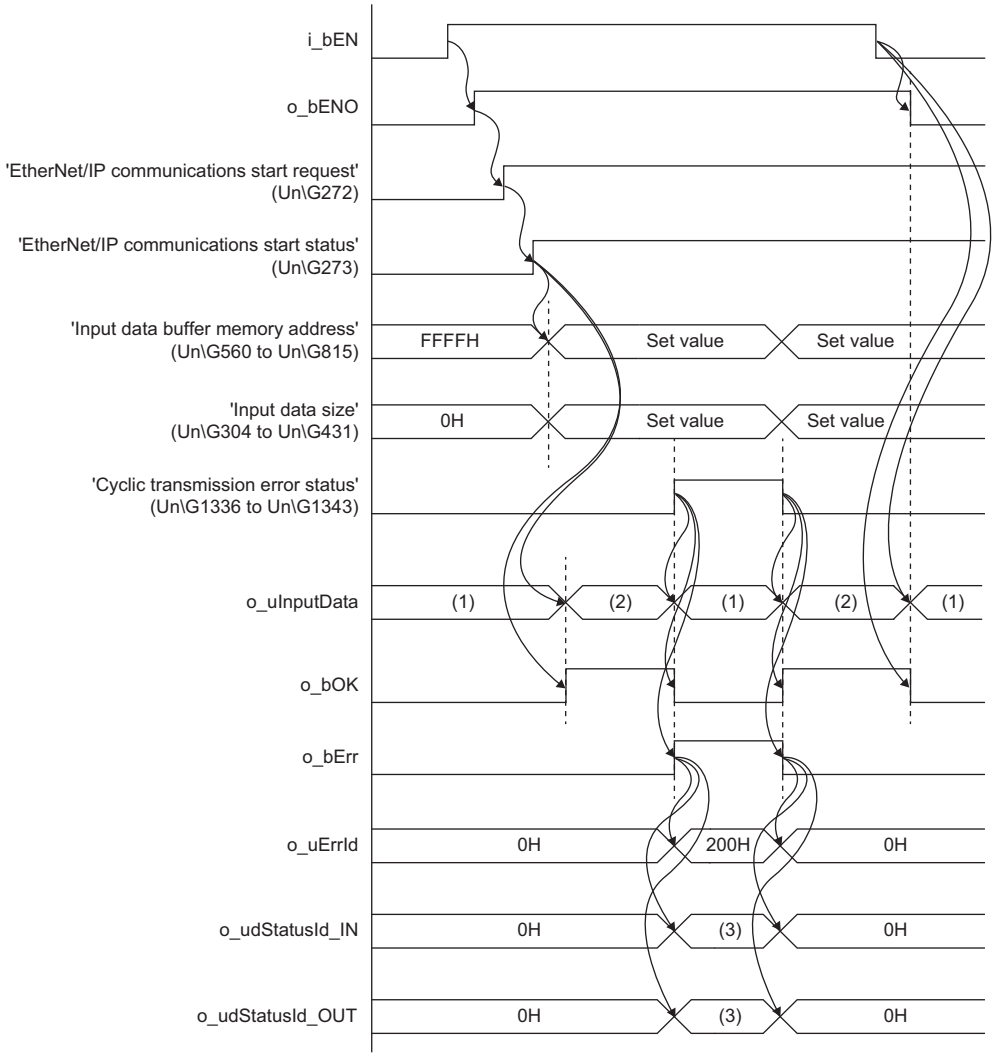
Processing

- By turning i_bEN (Execution command) on, the input data of the specified connection is acquired by Class1 communication.
- The input data is continuously stored in o_uInputData (Input data storage device) while i_bEN (Execution command) and o_bOK (Normal completion) are on.
- By turning i_bEN (Execution command) on, 'EtherNet/IP communication start request' (Un\G272) turns on.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

Timing chart of I/O signals

■For normal completion

When the operation is recovered after an error occurs for a certain time during communication



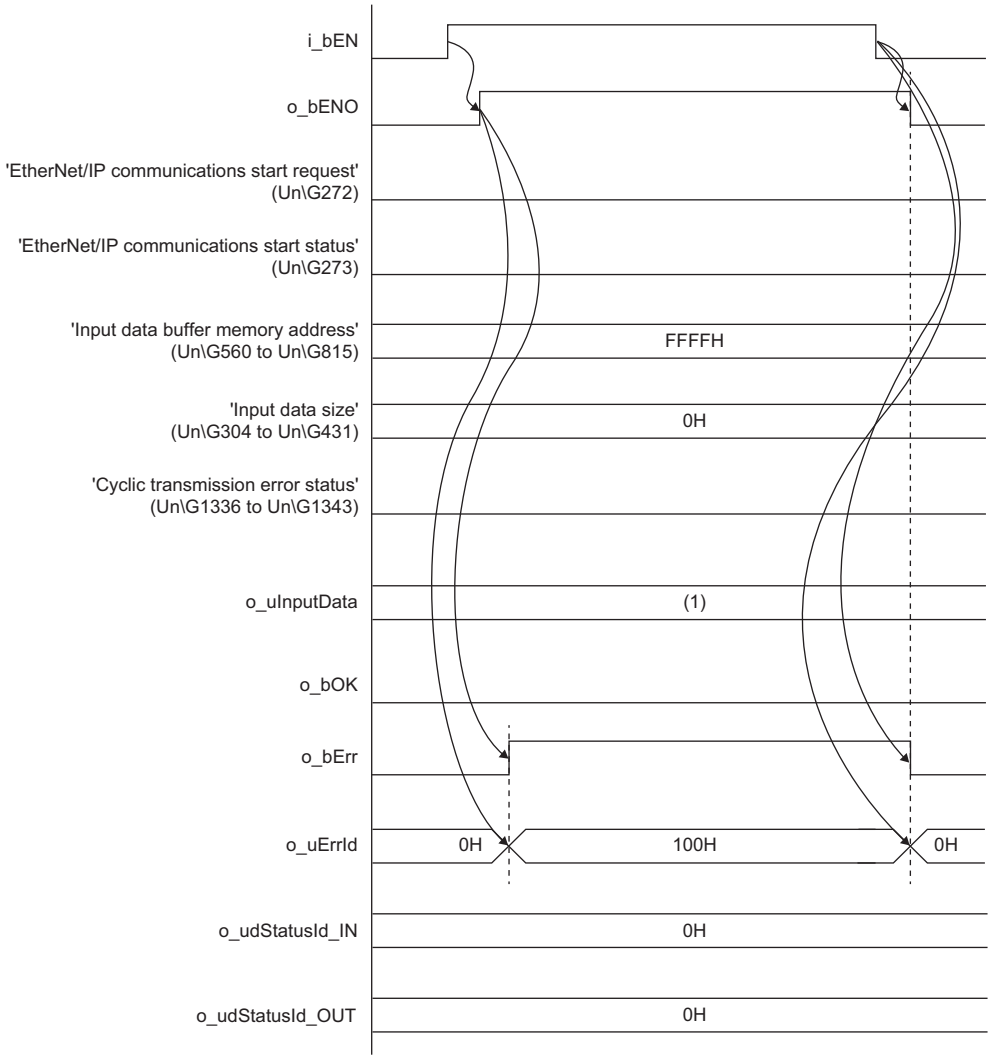
(1) The last value is held.

(2) The input data is stored.

(3) Error code

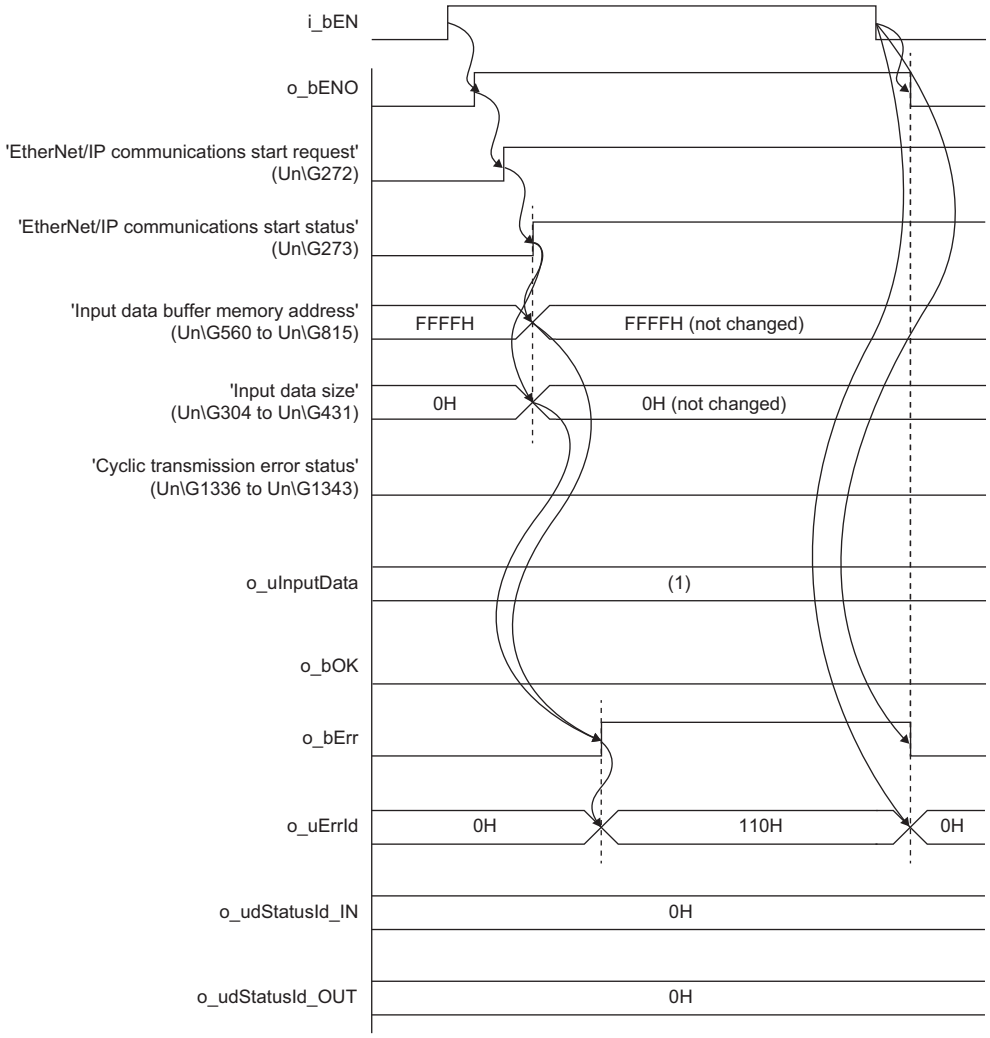
■For error completion

• Out of setting range for i_uConnectionNo (connection No.)



(1) The last value is held.

• Input data is not allocated to the target connection



(1) The last value is held.

Restrictions or precautions

- Even if i_bEN (Execution command) is turned off, 'EtherNet/IP communication start request' (Un\G272) does not turn off. To stop the EtherNet/IP communication, turn off i_bEN (Execution command) of all the FBs of the FX5-EIP/IP in the program, then turn off 'EtherNet/IP communication start request' (Un\G272).
- With 'Connection-unit block assurance status' (Un\G231) set to K2 (Data assured), old data may be read until the first input data is received if this FB is executed when 'Input data update status' (Un\G1072 to Un\G1199) in the buffer memory area with the same i_uConnectionNo (Connection No.) is turned on.
- For the device where o_uInputData (Input data storage device) is to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*1 that has the same number as i_uConnectionNo (Connection No.).
  - 'Input data size' (Un\G304 to Un\G431)
  - 'Input data buffer memory address' (Un\G560 to Un\G815)
  - 'Cyclic pause specification' (Un\G1360 to Un\G1367)

*1 The 'n'th area of the buffer memory, where 'n' is the same number as i_uConnectionNo (Connection No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

Error code

Error code	Description	Action
100H	The setting value of i_uConnectionNo (Connection No.) is invalid.	After reviewing the setting, re-execute the FB.
108H	EtherNet/IP communication has been suspended.	Re-execute the FB.
110H	Input data for Class1 communications is not assigned to the target connection.	After reviewing the settings for "EtherNet/IP Configuration" of GX Works3, re-execute the FB. Check whether the value set in a change-prohibited buffer memory area has been changed. Change-prohibited buffer memory areas are described in the 'Restrictions and precautions' section.*1
112H	A connection assigned as a reserved station was used.	Review the value set for i_uConnectionNo (Connection No.) or review the settings in "EtherNet/IP Configuration" of GX Works3.
200H	A connection communication error has occurred in the target connection.	Check the error code stored in o_udStatusId_IN (Error code of connection communication error on the input side) or o_udStatusId_OUT (Error code of connection communication error on the output side). 📖MELSEC iQ-F FX5-EIP User's Manual (Application)

*1 Assume that no connection assignments exist if any of the following conditions is met.

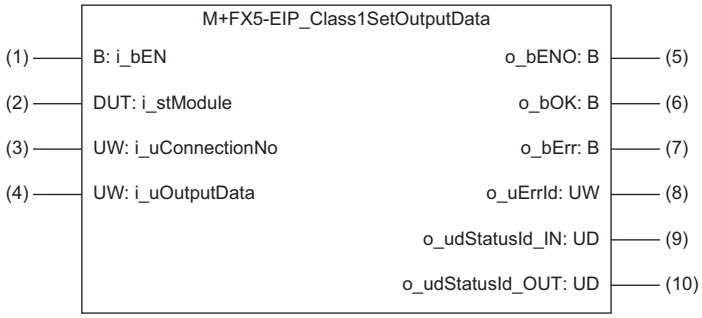
- The value of 'Input data buffer memory address' (Un\G560 to Un\G815) is set to 0H or FFFFFFFFH.
- 'Input data size' (Un\G304 to Un\G431) is set to 0H.
- 'Input data size' (Un\G304 to Un\G431) is set to a value exceeding the maximum data size compatible with the maximum number of connections setting.
- 'Communications method specification for message communications request area' (Un\G4656) is set to a value other than 0.

For the maximum data size compatible with the maximum number of connections setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

5.3 M+FX5-EIP_Class1SetOutputData (Class1 communications output data setting)

Overview

Sets output data of the specified connection through the Class1 communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/ Bit String [16-bit]	Only when the FB is activated	1 to 128	Specify the number of the connection where the input data is acquired. • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128
(4)	i_uOutputData	Output data storage device	Word [Unsigned]/ Bit String [16-bit]	Always	—	Specify the head number of the device where the output data is stored.

Output label

No.	Variable name	Name	Data type	Default value	Description
(5)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(6)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(7)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(8)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(9)	o_udStatusId_IN	Error code of connection communication error on the input side	Double word [unsigned]/bit string [32 bits]	0	An error code on the input side is stored when a connection communication error has occurred (when 200H is stored in o_uErrId).
(10)	o_udStatusId_OUT	Error code of connection communication error on the output side	Double word [unsigned]/bit string [32 bits]	0	An error code on the output side is stored when a connection communication error has occurred (when 200H is stored in o_uErrId).

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	715 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 24 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

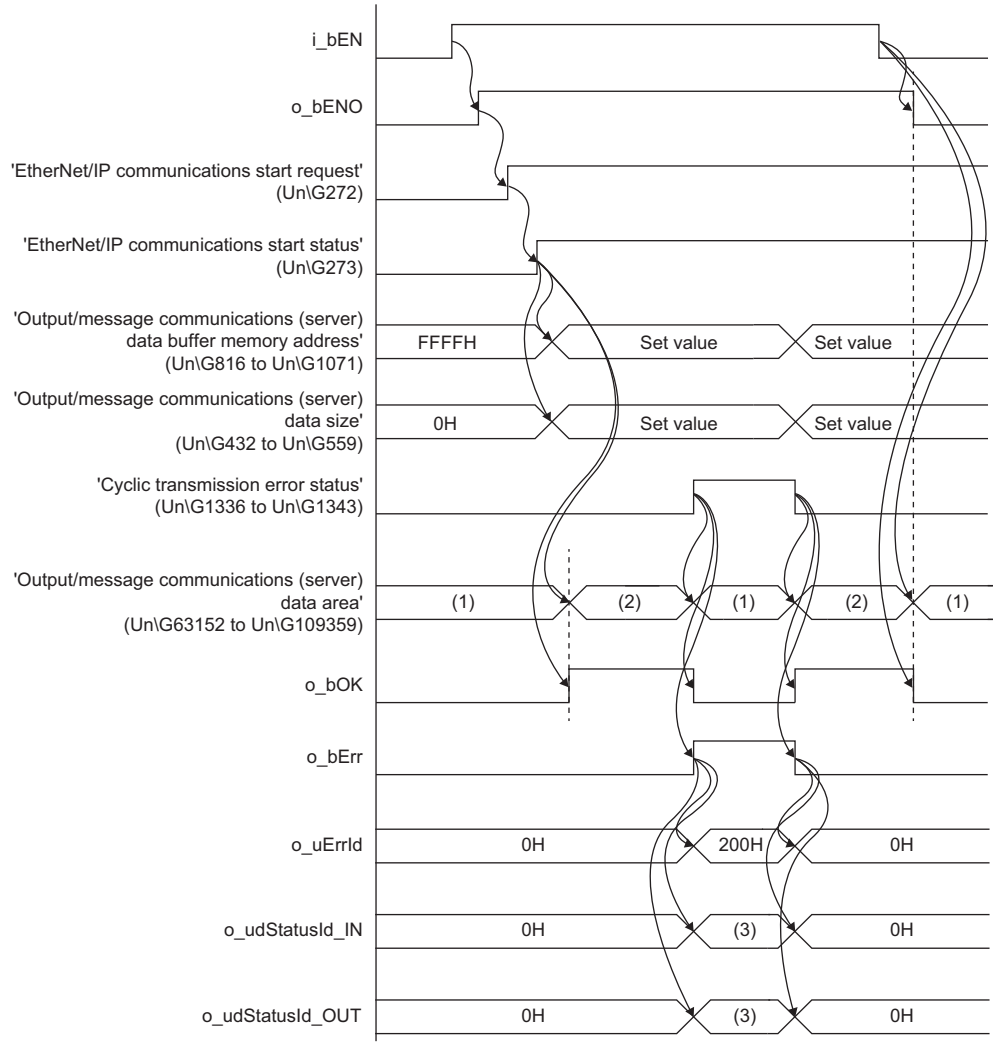
Processing

- By turning i_bEN (Execution command) on, the output data of the specified connection is set through Class1 communications.
- The designated number is continuously stored in the output area for the specified connection number from i_uOutputData (Output data storage device) while i_bEN (Execution command) and o_bOK (Normal completion) are on. For the number of devices transferred from i_uOutputData (Output data storage device), refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- By turning i_bEN (Execution command) on, 'EtherNet/IP communication start request' (Un\G272) turns on.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

Timing chart of I/O signals

■For normal completion

When the operation is recovered after an error occurs for a certain time during communication



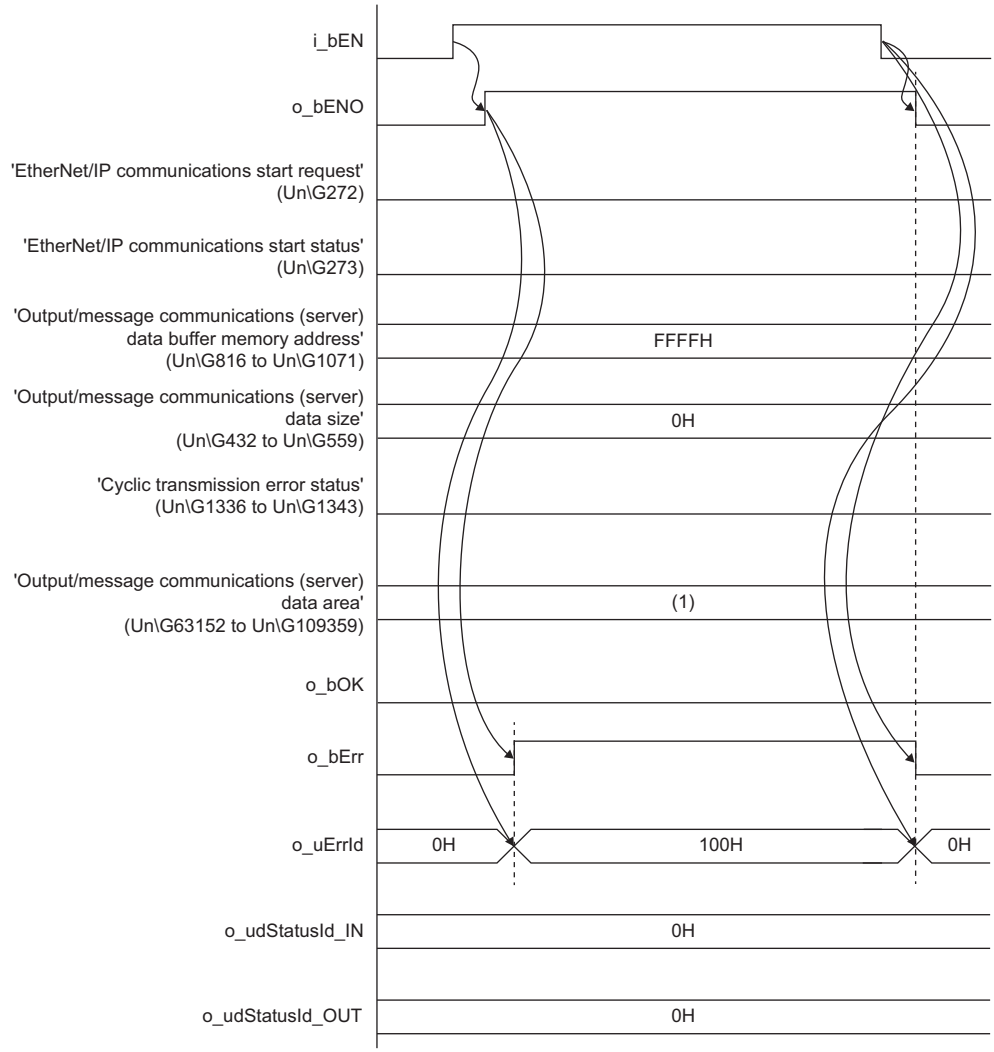
(1) The last value is held.

(2) Data are updated to the value stored in i_uOutputData (output data storage device).

(3) Error code

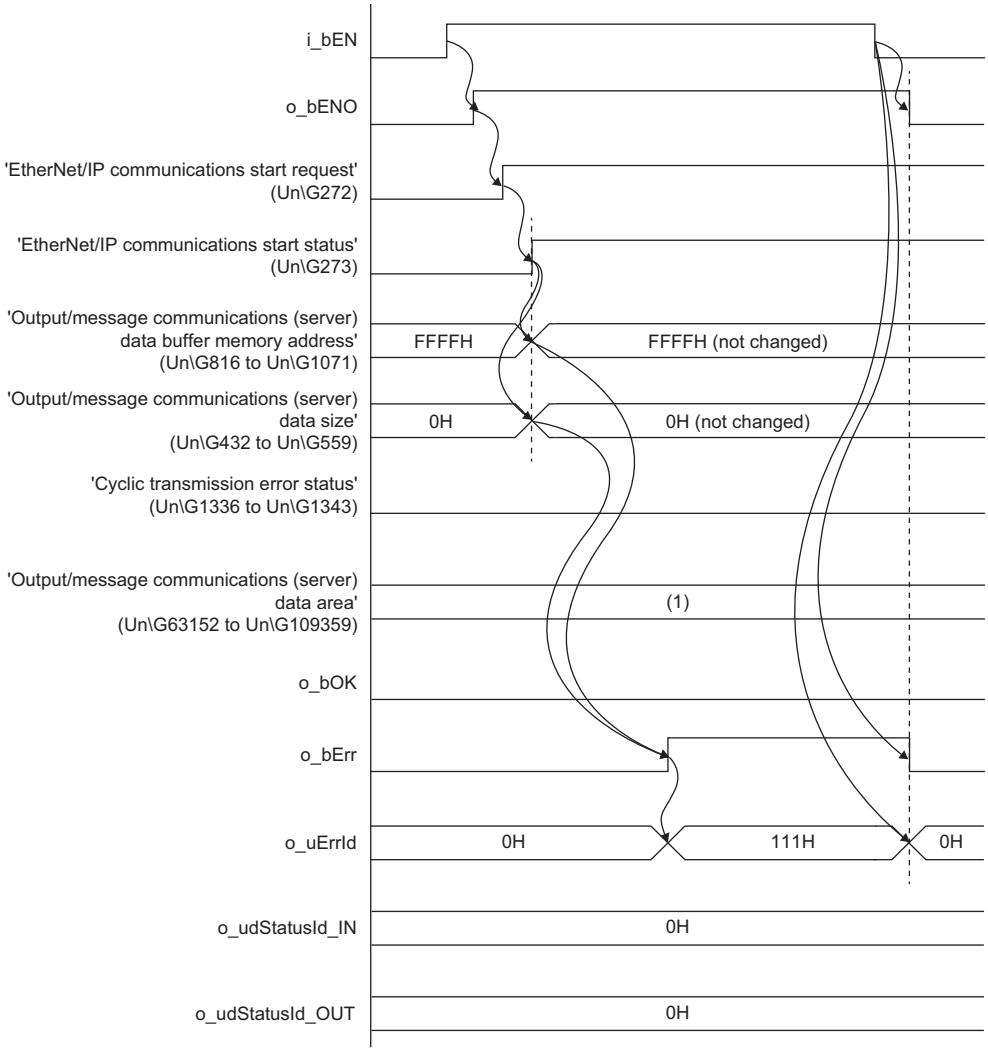
■For error completion

- Out of setting range for i_uConnectionNo (connection No.)



(1) The last value is held.

• Input data is not allocated to the target connection



(1) The last value is held.

Restrictions or precautions

- Even if i_bEN (Execution command) is turned off, 'EtherNet/IP communication start request' (Un\G272) does not turn off. To stop the EtherNet/IP communication, turn off i_bEN (Execution command) of all the FBs of the FX5-EIP/IP in the program, then turn off 'EtherNet/IP communication start request' (Un\G272).
- For the device where i_uOutputData (Output data storage device) is to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*1 that has the same number as i_uConnectionNo (Connection No.).
  - 'Output/message communications (server) data size' (Un\G432 to Un\G559)
  - 'Output/message communications (server) data buffer memory address' (Un\G816 to Un\G1071)
  - 'Cyclic pause specification' (Un\G1360 to Un\G1367)

*1 The 'n'th area of the buffer memory, where 'n' is the same number as i_uConnectionNo (Connection No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

Error code

Error code	Description	Action
100H	The setting value of i_uConnectionNo (Connection No.) is invalid.	After reviewing the setting, re-execute the FB.
108H	EtherNet/IP communication has been suspended.	Re-execute the FB.
111H	Output data for Class1 communications is not assigned to the target connection.	After reviewing the settings for "EtherNet/IP Configuration" of GX Works3, re-execute the FB. Check whether the value set in a change-prohibited buffer memory area has been changed. Change-prohibited buffer memory areas are described in the 'Restrictions and precautions' section.*1
112H	A connection assigned as a reserved station was used.	Review the value set for i_uConnectionNo (Connection No.) or review the settings in "EtherNet/IP Configuration" of GX Works3.
200H	A connection communication error has occurred in the target connection.	Check the error code stored in o_udStatusId_IN (Error code of connection communication error on the input side) or o_udStatusId_OUT (Error code of connection communication error on the output side). MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

*1 Assume that no connection assignments exist if any of the following conditions is met.

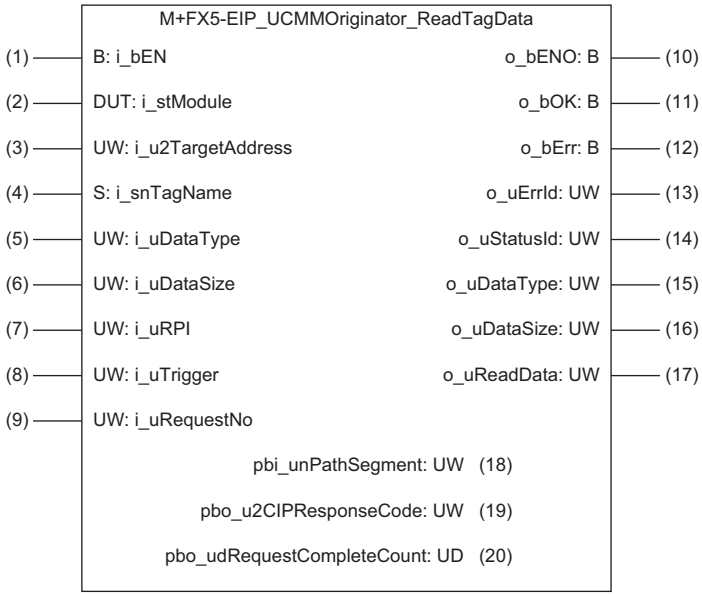
- The value of 'Output/message communications (server) data buffer memory address' (Un\G816 to Un\G1071) is set to 0H or FFFFFFFFH.
- 'Output/message communications (server) data size' (Un\G432 to Un\G559) is set to 0H.
- 'Output/message communications (server) data size' (Un\G432 to Un\G559) is set to a value exceeding the maximum data size compatible with the maximum number of connections setting.
- 'Communications method specification for message communications request area' (Un\G4656) is set to a value other than 0.

For the maximum data size compatible with the maximum number of connections setting, refer to the MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

5.4 M+FX5-EIP_UCMMOriginator_ReadTagData (UCMM tag communications data acquisition)

Overview

Acquires data from the tag of the specified target device through the UCMM tag communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_u2TargetAddress	IP address	Word [unsigned]/bit string [16 bits] (0..1)	Only when the FB is activated	—	Specify the IP address of the target device.
(4)	i_snTagName	Tag name	Character string (255)	Only when the FB is activated	*1	Specify the tag name of the target device to be read.
(5)	i_uDataType	Read request tag data type	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	00C3H 00C4H	Specify the data type of the tag to be read. • 00C3H: INT (1 word) • 00C4H: DINT (2 words)
(6)	i_uDataSize	Read request data size	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 249	Specify the number of data points to be read. The number of data points to be read is calculated by the data type × the number of data points. ■Range • INT (00C3H): 1 to 249 • DINT (00C4H): 1 to 124
(7)	i_uRPI	RPI	Word [unsigned]/bit string [16 bits]	Always	200 to 60000	■When Trigger specification is set to Cyclic Specify the send cycle. (Unit: millisecond) ■When Trigger specification is set to Application Trigger Settings are not required. (Any settings are ignored.)
(8)	i_uTrigger	Trigger specification	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	0000H 0010H	Specify the send trigger. • 0000H: Application Trigger • 0010H: Cyclic

No.	Variable name	Name	Data type	Import	Range	Description
(9)	i_uRequestNo	Request No.	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 128	Specify the request No. for acquiring the input data.*2 • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128

*1 For details on the characters that can be used for the tag name, refer to the following.
MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

*2 Do not specify a request No. that is the same as the connection number in Class3 communications parameters set in "EtherNet/IP Configuration" of GX Works3. Specify a request No. that is not set in Class3 communications parameters.

Output labels

No.	Variable name	Name	Data type	Default value	Description
(10)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(11)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(12)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(13)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(14)	o_uStatusId	Error code of communication error	Word [unsigned]/bit string [16 bits]	0	An error code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)).
(15)	o_uDataType	Read tag data type	Word [unsigned]/bit string [16 bits]	0	The data type that is set for a tag received from the target device is stored.*1 • 00C3H: INT (1 word) • 00C4H: DINT (2 words)
(16)	o_uDataSize	Read data size	Word [unsigned]/bit string [16 bits]	0	The size of the read data is stored.*2
(17)	o_uReadData	Read data storage device	Word [unsigned]/bit string [16 bits]	0	Data read from a tag of the target device is stored in the specified device, starting from the first area and continuing into subsequent areas. The type size of the stored data is calculated as follows: o_uDataSize (Read data size) × o_uDataType (Read tag data type).

*1 It may differ from the read request tag data type because the data type of the tag read from the target device is set.

*2 The unit of data points is to be 1 word when the read tag data type is INT, and 2 words when DINT.

Operation parameter

No.	Variable name	Name	Data type	Default value	Range	Description
(18)	pbi_unPathSegment	PathSegment	Word [unsigned]/bit string [16 bits]	0	—	Specify the Path Segment data to be given at connection during UCMM tag communications. Specify 0 when not using it.*1*2

*1 Specify 0 to access the Class3 tag or UCMM tag that is set in the module.

*2 For details on this parameter, refer to the following.
MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

Public variable

No.	Variable name	Name	Data type	Default value	Description
(19)	pbo_u2CIPResponseCode	CIP response code	Word [unsigned]/bit string [16 bits] (0..1)	0	The CIP response code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)). For details on the CIP response code, refer to the manual for the target device that sends the response command.
(20)	pbo_udRequestCompleteCount	Number of completed executions	Double word [unsigned]/bit string [32 bits]	0	The number of completed executions for UCMM tag communications is stored.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	1494 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 292 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

Processing

■When Trigger specification is set to Cyclic

- When i_bEN (Execution command) is turned on, data is periodically acquired from the tag of the specified target device through the UCMM tag communications.
- The read data is continuously stored in o_uReadData (Read data storage device) while i_bEN (Execution command) and o_bOK (Normal completion) are on.

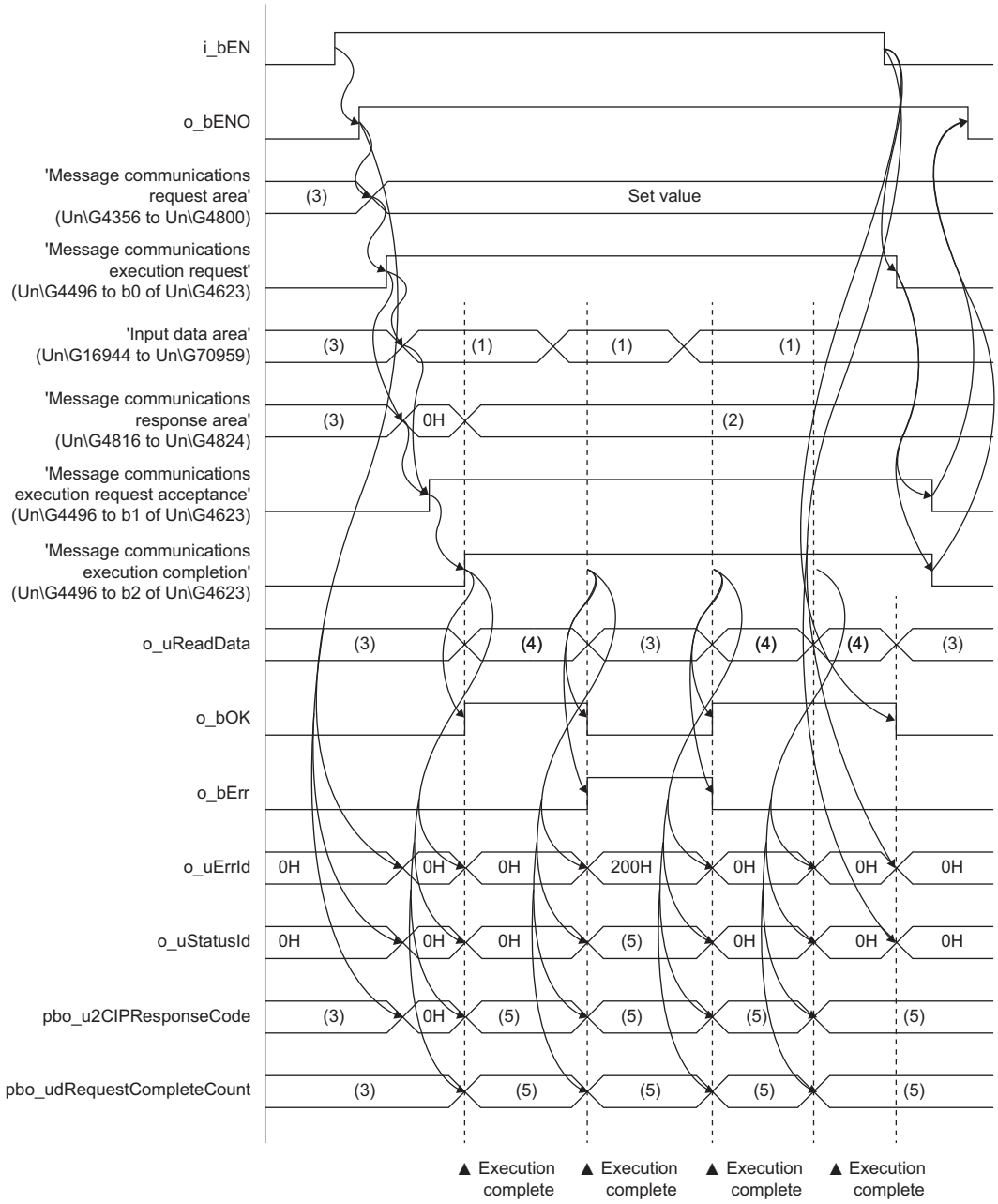
■When Trigger specification is set to Application Trigger

- When i_bEN (Execution command) is turned on, data is acquired from the tag of the specified target device through the UCMM tag communications.

Timing chart of I/O signals

■For normal completion when Trigger specification is set to Cyclic

When the operation is recovered after an error occurs for a certain time during communication



(1) Read data

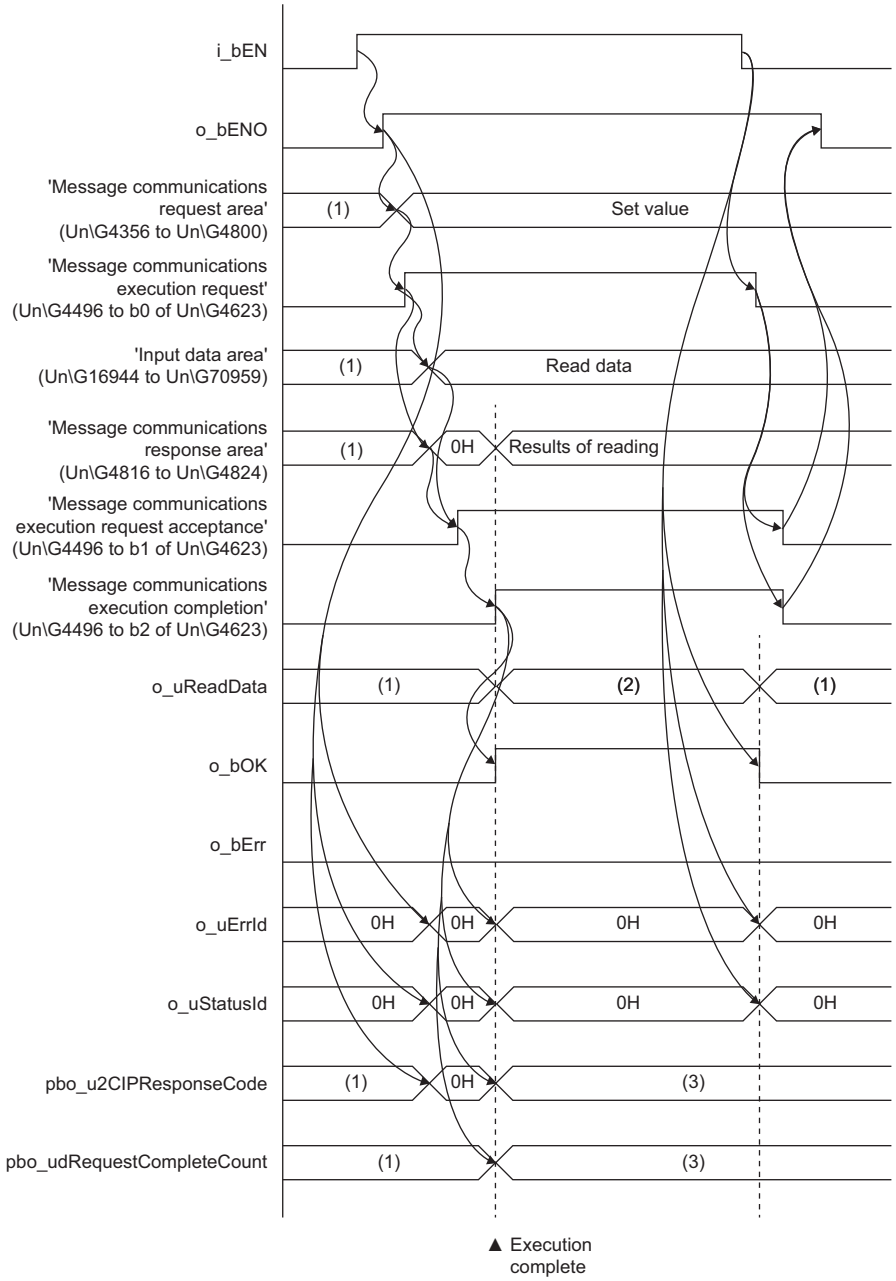
(2) Result of reading

(3) The last value is held.

(4) Read data is stored.

(5) Results storage area in the response area/stored value

■For normal completion when Trigger specification is set to Application Trigger



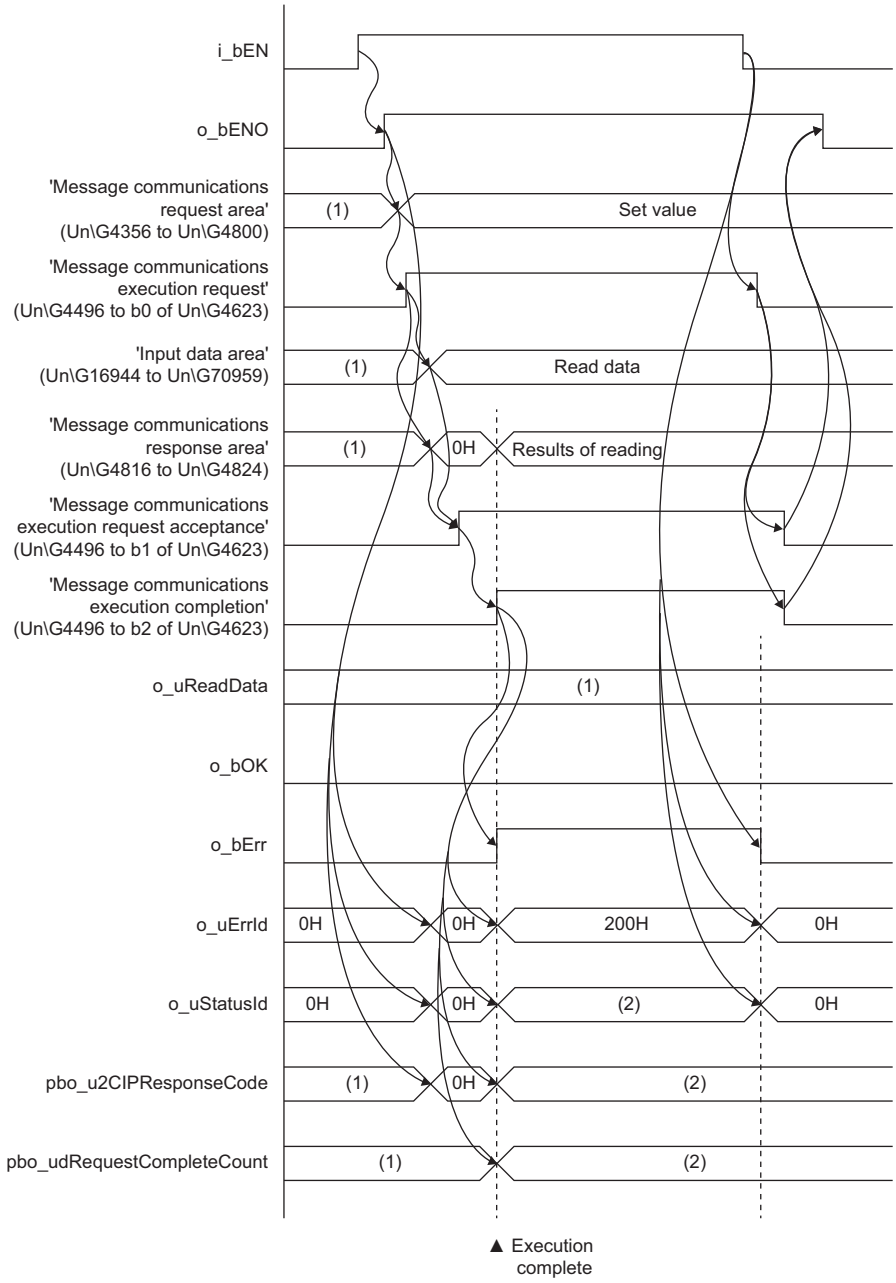
(1) The last value is held.

(2) Read data is stored.

(3) Results storage area in the response area/stored value

■For error completion when Trigger specification is set to Application Trigger

When a communication error occurs



(1) The last value is held.

(2) Results storage area in the response area/stored value

Restrictions or precautions

- Refer to o_uReadData (Read data storage device) when o_bOK (Normal completion) is turned on.
- Refer to o_uErrId (Error code) and o_uStatusId (Error code of communication error) when o_bErr (Error completion) is turned on.
- Do not turn off i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on. *1
- For the device where o_uReadData (Read data storage device) is to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*2 that has the same number as i_uRequestNo (Request No.).
  - 'Message communications execution request' (Un\G4496 to Un\G4623)
  - 'Message communications request/response area' (Un\G4656 to Un\G29231)
  - 'Input data area' (Un\G16944 to Un\G70959)
  - 'Output/message communications (server) data area' (Un\G63152 to Un\G109359)

*1 If i_bEN (Execution command) is turned off before o_bOK (Normal completion) or o_bErr (Error completion) is turned on, o_bErr (Error completion) is turned on while o_bENO (Execution status) is turned on and during the scan where the state of o_bENO (Execution status) is changed from off to on. Meanwhile, 113H (hexadecimal) is stored in o_uErrId (Error code).

*2 The 'n'th area of the buffer memory, where 'n' is the same number as i_uRequestNo (Request No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

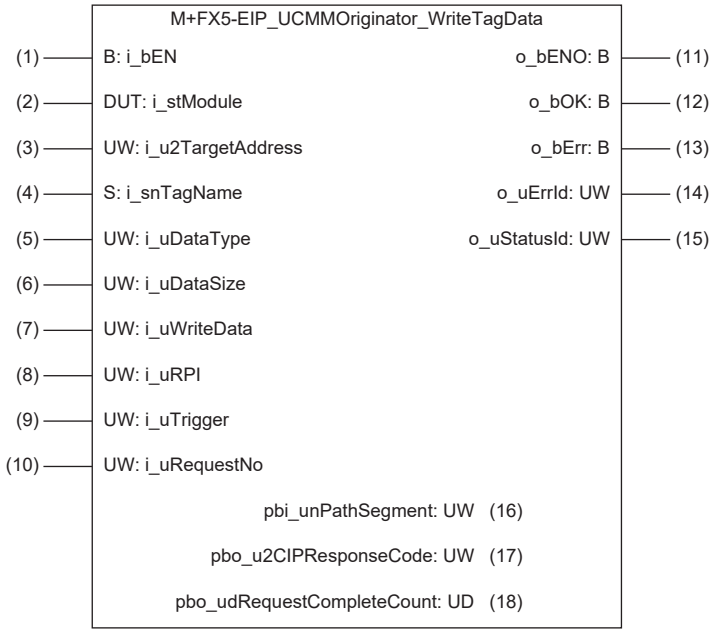
Error code

Error code	Description	Action
100H	The value of i_uRequestNo (Request No.) is out of range.	After reviewing the setting, re-execute the FB.
101H	The EtherNet/IP communications have stopped.	Set a value other than 0 for 'EtherNet/IP communications start request' (Un\G4256) and start the EtherNet/IP communications.
102H	The number of characters used for i_snTagName (Tag name) is out of range.	Set i_snTagName (Tag name) using 1 to 255 characters.
103H	UCMM used an inappropriate area.	• Check if the Class1 communications and Class3 communications are used in the area of Request No. • Check if the initial value for the area of Request No. has been changed using a ladder diagram or by other means.
108H	EtherNet/IP communication has been suspended.	Set a value other than 0 for EtherNet/IP communications start request (Un\G4256) and re-execute the FB.
113H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on.
114H	The previous request is being executed.	Ensure that 'Message communications execution request' (Un\G4496 to Un\G4623) of the relevant connection is turned off, then execute again.
200H	A communication error has occurred.	Check the value stored in o_uStatusId (Error code of communication error) by referring to the following. (When o_uStatusId (Error code of communication error) is set to 01FFH, the CIP response code is stored in pbo_u2CIPResponseCode (CIP response code).) 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

5.5 M+FX5-EIP_UCMMOriginator_WriteTagData (UCMM tag communications data setting)

Overview

Sets data for the tag of the specified target device through the UCMM tag communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_u2TargetAddress	IP address	Word [unsigned]/bit string [16 bits] (0..1)	Only when the FB is activated	—	Specify the IP address of the target device.
(4)	i_snTagName	Tag name	Character string (255)	Only when the FB is activated	*1	Specify the tag name of the target device to be written.
(5)	i_uDataType	Tag data type	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	00C3H 00C4H	Specify the data type of the tag to be written. • 00C3H: INT (1 word) • 00C4H: DINT (2 words)

No.	Variable name	Name	Data type	Import	Range	Description
(6)	i_uDataSize	Write data size	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 245	Specify the number of data points to be written. The number of data points to be written is calculated by the tag data type × the number of data points. ■Range • When the tag data type is INT (00C3H) and PathSegment is 0: 1 to (494 - the number of characters of the tag name) ÷ 2 (decimals are omitted) • When the tag data type is INT (00C3H) and PathSegment is other than 0: 1 to (480 - the number of characters of the tag name) ÷ 2 (decimals are omitted) • When the tag data type is DINT (00C4H) and PathSegment is 0: 1 to (494 - the number of characters of the tag name) ÷ 4 (decimals are omitted) • When the tag data type is DINT (00C4H) and PathSegment is other than 0: 1 to (480 - the number of characters of the tag name) ÷ 4 (decimals are omitted)
(7)	i_uWriteData	Write data storage device	Word [unsigned]/bit string [16 bits]	Always	—	Data (write data size × type size for the tag data type) is written to the tag specified with the tag name of the target device specified with the IP address from the start of the specified device.
(8)	i_uRPI	RPI	Word [unsigned]/bit string [16 bits]	Always	200 to 60000	■When Trigger specification is set to Cyclic Specify the send cycle. (Unit: millisecond) ■When Trigger specification is set to Application Trigger Settings are not required. (Any settings are ignored.)
(9)	i_uTrigger	Trigger specification	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	0000H 0010H	Specify the send trigger. • 0000H: Application Trigger • 0010H: Cyclic
(10)	i_uRequestNo	Request No.	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 128	Specify the number of Request No. where the input data is acquired.*2 • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128

*1 For details on the characters that can be used for the tag name, refer to the following.
MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

*2 Do not specify a request No. that is the same as the connection number in Class3 communications parameters set in "EtherNet/IP Configuration" of GX Works3. Specify a request No. that is not set in Class3 communications parameters.

Output labels

No.	Variable name	Name	Data type	Default value	Description
(11)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(12)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(13)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(14)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(15)	o_uStatusId	Error code of communication error	Word [unsigned]/bit string [16 bits]	0	An error code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)).

Operation parameter

No.	Variable name	Name	Data type	Default value	Range	Description
(16)	pbi_unPathSegment	PathSegment	Word [unsigned]/bit string [16 bits]	0	—	Specify the Path Segment data to be given at connection during UCMM tag communications. Specify 0 when not using it.*1*2

*1 Specify 0 to access the Class3 tag or UCMM tag that is set in the module.

*2 For details on this parameter, refer to the following.
MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

Public variable

No.	Variable name	Name	Data type	Default value	Description
(17)	pbo_u2CIPResponseCode	CIP response code	Word [unsigned]/bit string [16 bits] (0..1)	0	The CIP response code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)). For details on the CIP response code, refer to the manual for the target device that sends the response command.
(18)	pbo_udRequestCompleteCount	Number of completed executions	Double word [unsigned]/bit string [32 bits]	0	The number of completed executions for UCMM tag communications is stored. When the read data is updated, this area is also updated.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	1375 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 292 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

Processing

■When Trigger specification is set to Cyclic

- When i_bEN (Execution command) is turned on, data is periodically set for the tag of the specified target device through the UCMM tag communications.
- While i_bEN (Execution command) is turned on, the requested data is continuously updated to the value stored in i_uWriteData (Read data storage device).

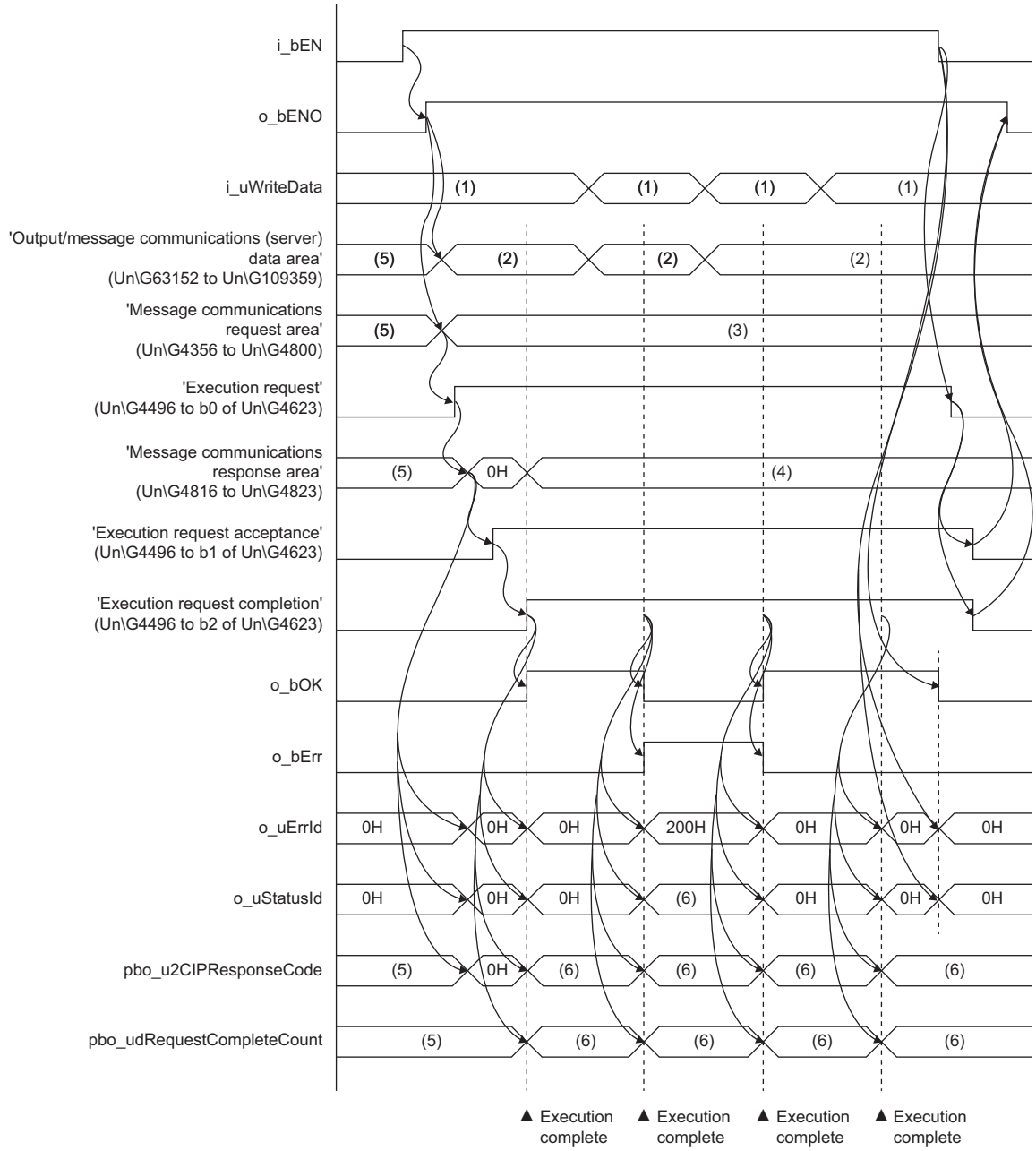
■When Trigger specification is set to Application Trigger

- When i_bEN (Execution command) is turned on, data is set for the tag of the specified target device through the UCMM tag communications.

Timing chart of I/O signals

■For normal completion when Trigger specification is set to Cyclic

When the operation is recovered after an error occurs for a certain time during communication



(1) Write data start address

(2) Write data is stored.

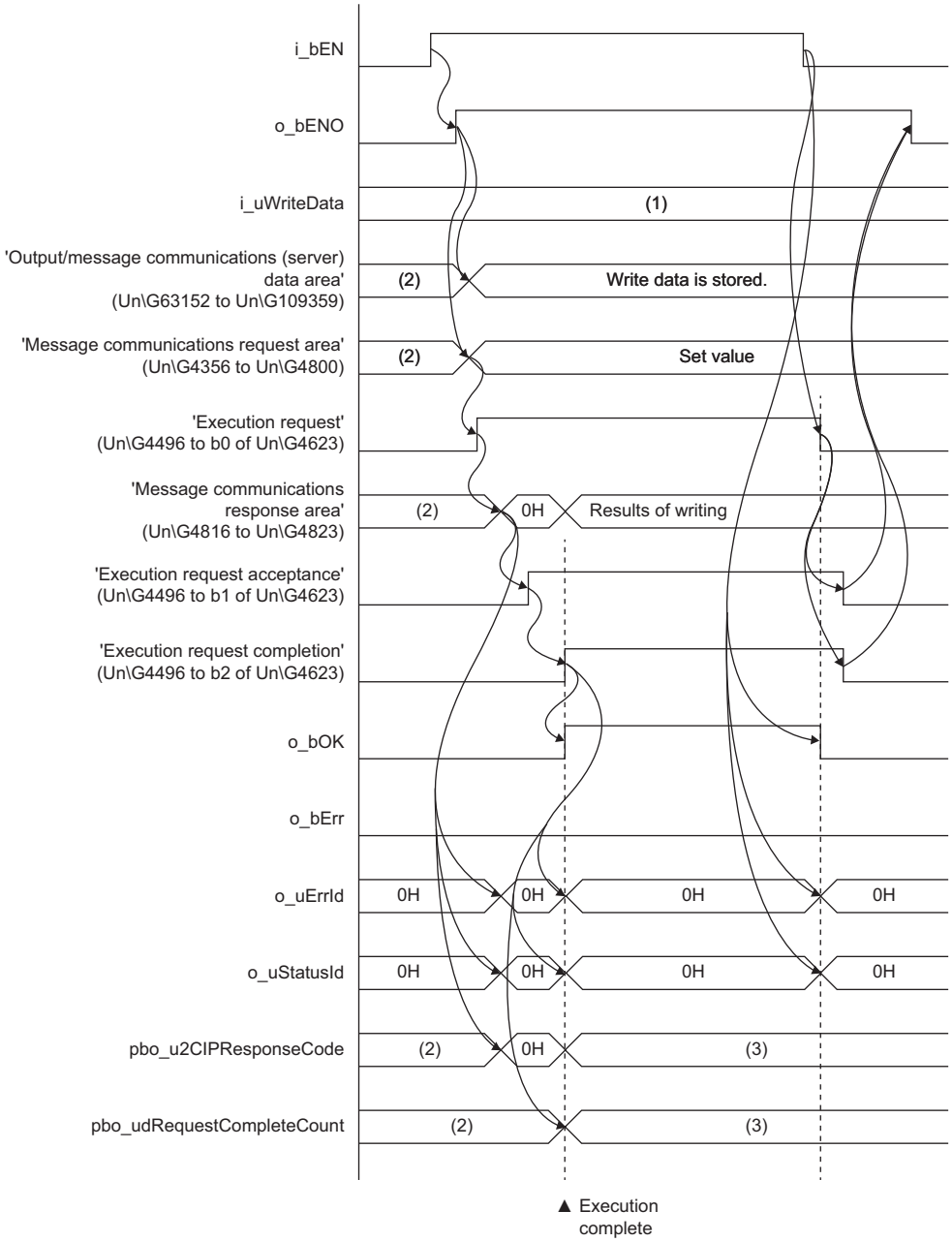
(3) Set value

(4) Results of writing

(5) The last value is held.

(6) Results storage area in the response area/stored value

■For normal completion when Trigger specification is set to Application Trigger



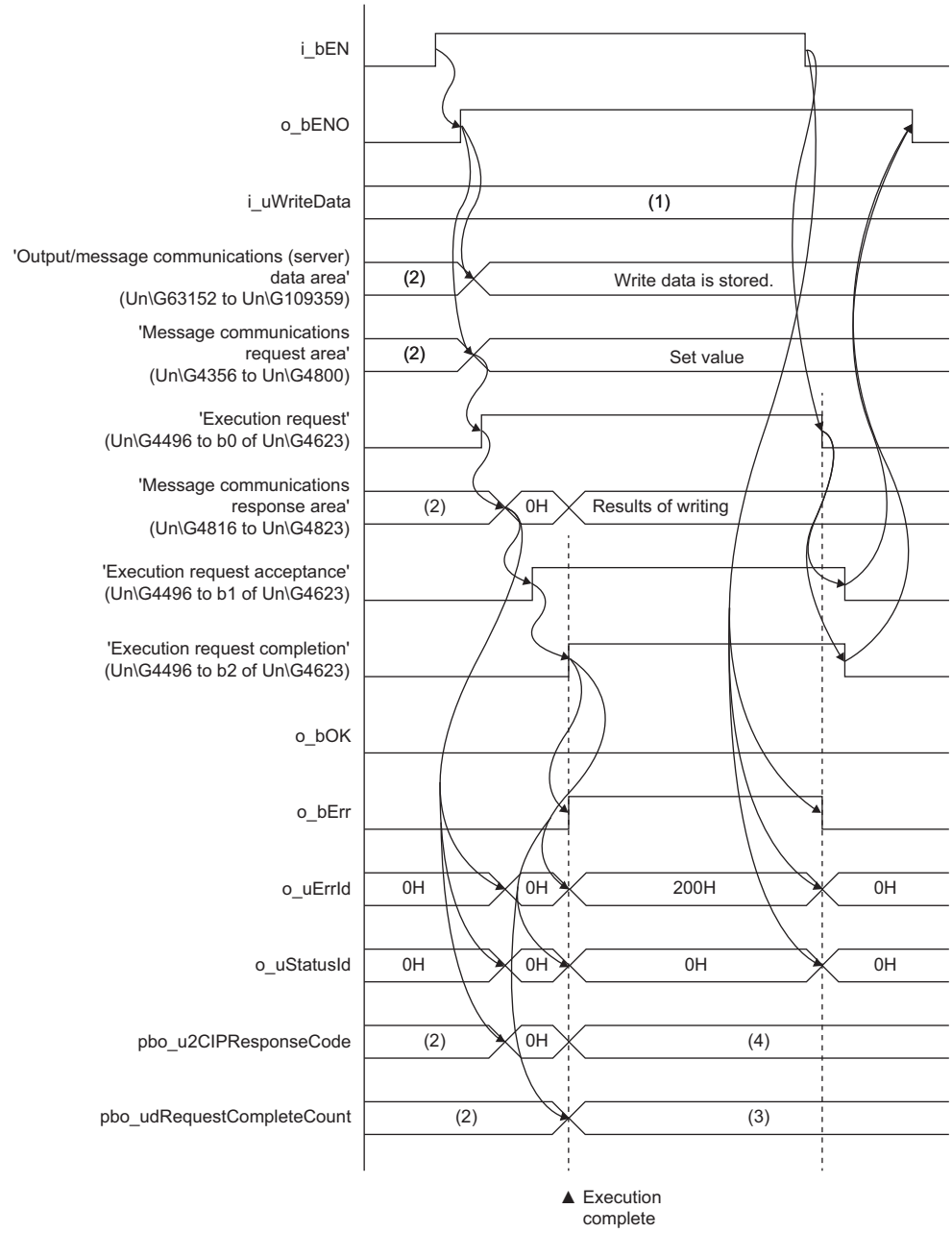
(1) Write data

(2) The last value is held.

(3) Results storage area in the response area/stored value

■For error completion when Trigger specification is set to Application Trigger

When a communication error occurs



(1) Write data

(2) The last value is held.

(3) Results storage area in the response area/stored value

(4) CIP response code

Restrictions or precautions

- Refer to o_uErrId (Error code) and o_uStatusId (Error code of communication error) when o_bErr (Error completion) is turned on.
- Do not turn off i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on. *1
- For the device where i_uWriteData (Read data storage device) is to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*2 that has the same number as i_uRequestNo (Request No.).
  - 'Message communications execution request' (Un\G4496 to Un\G4623)
  - 'Message communications request/response area' (Un\G4656 to Un\G29231)
  - 'Input data area' (Un\G16944 to Un\G70959)
  - 'Output/message communications (server) data area' (Un\G63152 to Un\G109359)

*1 If i_bEN (Execution command) is turned off before o_bOK (Normal completion) or o_bErr (Error completion) is turned on, o_bErr (Error completion) is turned on while o_bENO (Execution status) is turned on and during the scan where the state of o_bENO (Execution status) is changed from off to on. Meanwhile, 113H (hexadecimal) is stored in o_uErrId (Error code).

*2 The 'n'th area of the buffer memory, where 'n' is the same number as i_uRequestNo (Request No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

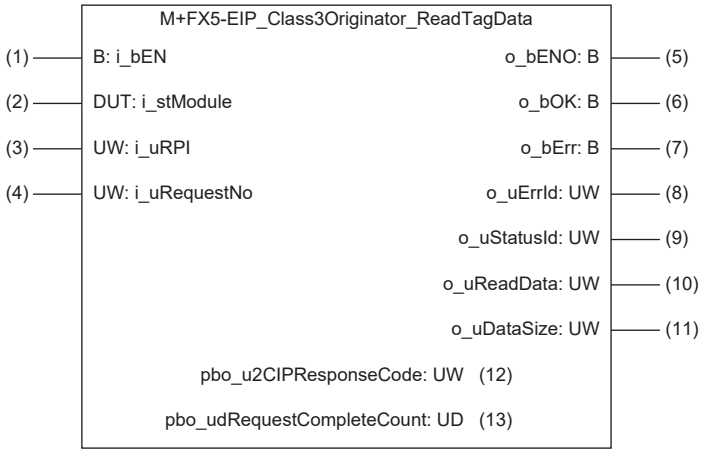
Error code

Error code	Description	Action
100H	The value of i_uRequestNo (Request No.) is out of range.	After reviewing the setting, re-execute the FB.
101H	The EtherNet/IP communications have stopped.	Set a value other than 0 for 'EtherNet/IP communications start request' (Un\G4256) and start the EtherNet/IP communications.
102H	The number of characters used for i_snTagName (Tag name) is out of range.	Set i_snTagName (Tag name) using 1 to 255 characters.
103H	UCMM used an inappropriate area.	• Check if the Class1 communications and Class3 communications are used in Request No. • Check if the initial value for the area of Request No. has been changed using a ladder diagram or by other means.
108H	EtherNet/IP communication has been suspended.	Set a value other than 0 for EtherNet/IP communications start request (Un\G4256) and re-execute the FB.
113H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on.
114H	The previous request is being executed.	Ensure that 'Message communications execution request' (Un\G4496 to Un\G4623) of the relevant connection is turned off, then execute again.
200H	A communication error has occurred.	Check the value stored in o_uStatusId (Error code of communication error) by referring to the following. (When o_uStatusId (Error code of communication error) is set to 01FFH, the CIP response code is stored in pbo_u2CIPResponseCode (CIP response code).) 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

5.6 M+FX5-EIP_Class3Originator_ReadTagData (Class3 tag communications data acquisition)

Overview

Acquires data from the tag of the specified target device through the Class3 tag communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_uRPI	RPI	Word [unsigned]/bit string [16 bits]	Always	0, 200 to 60000*1	Specify the send cycle. (Unit: millisecond) Specify 0 when not changing from the value set in "EtherNet/IP Configuration" of GX Works3.
(4)	i_uRequestNo	Request No.	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 128	Specify the connection number to acquire input data.*2 • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128

*1 The operation is performed using the last value if a value out of range is set.

*2 Specify the same value as the connection number of the Class3 communications parameter set in "EtherNet/IP Configuration" of GX Works3.

Output labels

No.	Variable name	Name	Data type	Default value	Description
(5)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(6)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(7)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(8)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(9)	o_uStatusId	Error code of communication error	Word [unsigned]/bit string [16 bits]	0	An error code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)).
(10)	o_uReadData	Read data storage device	Word [unsigned]/bit string [16 bits]	0	Data read from the tag of the target device is stored in the specified device, starting from the first area and continuing into subsequent areas. The type size of the stored data is calculated as follows: Read data size × Type size for the read tag data type.*1
(11)	o_uDataSize	Read data size	Word [unsigned]/bit string [16 bits]	0	The number of the read data points (in units of words) is stored.

*1 For the tag name, tag data type, and the size of the target device for which a read is requested, set Class3 communications parameters in "EtherNet/IP Configuration" of GX Works3. The type size is to be 1 word when the tag data type is set to INT, and 2 words when DINT.

Public variable

■Public variable

No.	Variable name	Name	Data type	Default value	Description
(12)	pbo_u2CIPResponseCode	CIP response code	Word [unsigned]/bit string [16 bits] (0..1)	0	The CIP response code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)). For details on the CIP response code, refer to the manual for the target device that sends the response command.
(13)	pbo_udRequestCompleteCount	Number of completed executions	Double word [unsigned]/bit string [32 bits]	0	The number of completed executions for Class3 tag communications is stored.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	1183 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 24 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

Processing

To perform Class3 tag communications, set Class3 communications parameters for the module using "EtherNet/IP Configuration" of GX Works3.

■When Trigger specification is set to Cyclic

- When i_bEN (Execution command) is turned on, data is periodically acquired from the tag of the specified target device through the Class3 tag communications.
- The read data is continuously stored in o_uReadData (Read data storage device) while i_bEN (Execution command) and o_bOK (Normal completion) are on.

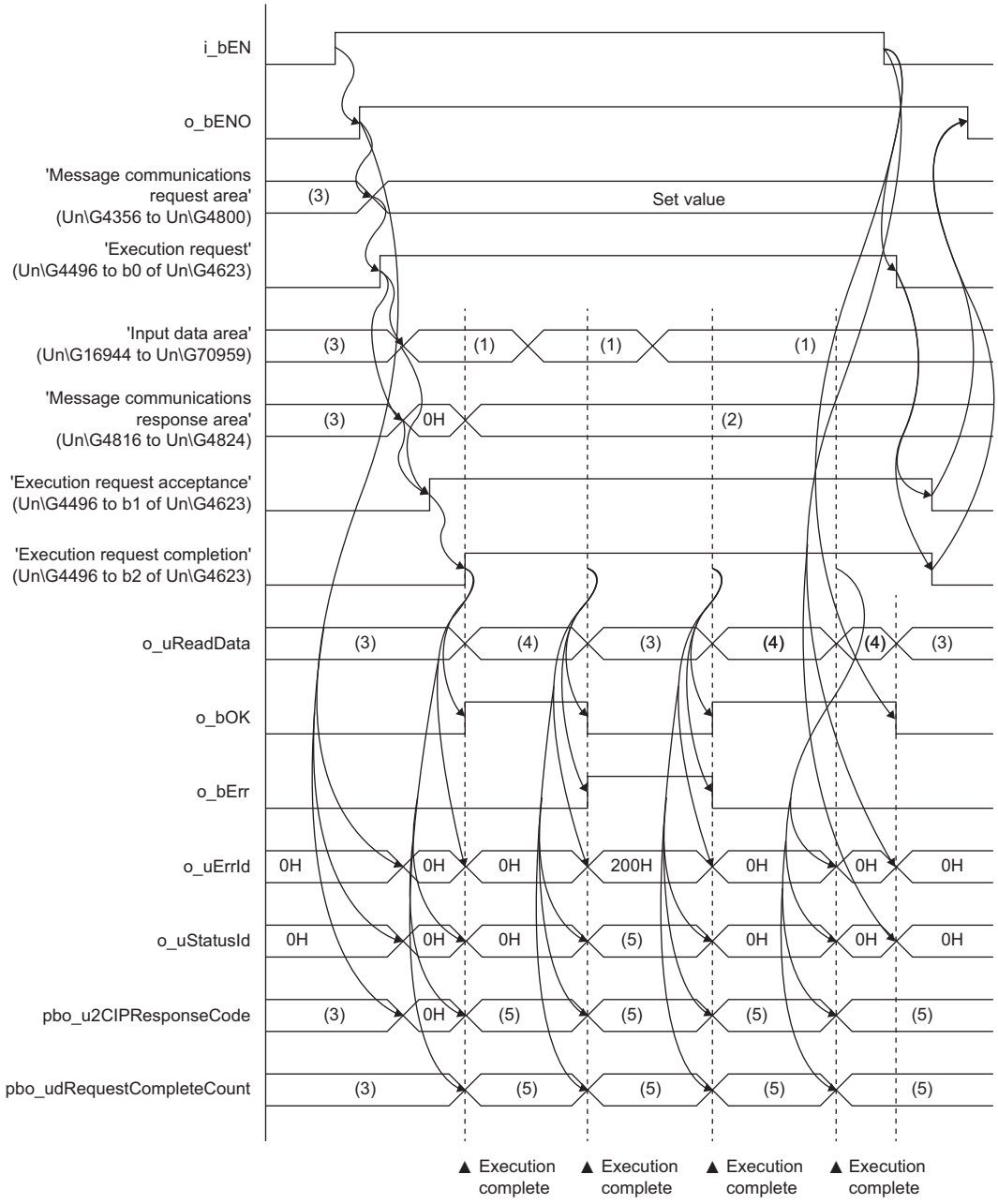
■When Trigger specification is set to Application Trigger

- When i_bEN (Execution command) is turned on, data is acquired from the tag of the specified target device through the Class3 tag communications.

Timing chart of I/O signals

■For normal completion when Trigger specification is set to Cyclic

When the operation is recovered after an error occurs for a certain time during communication



(1) Read data

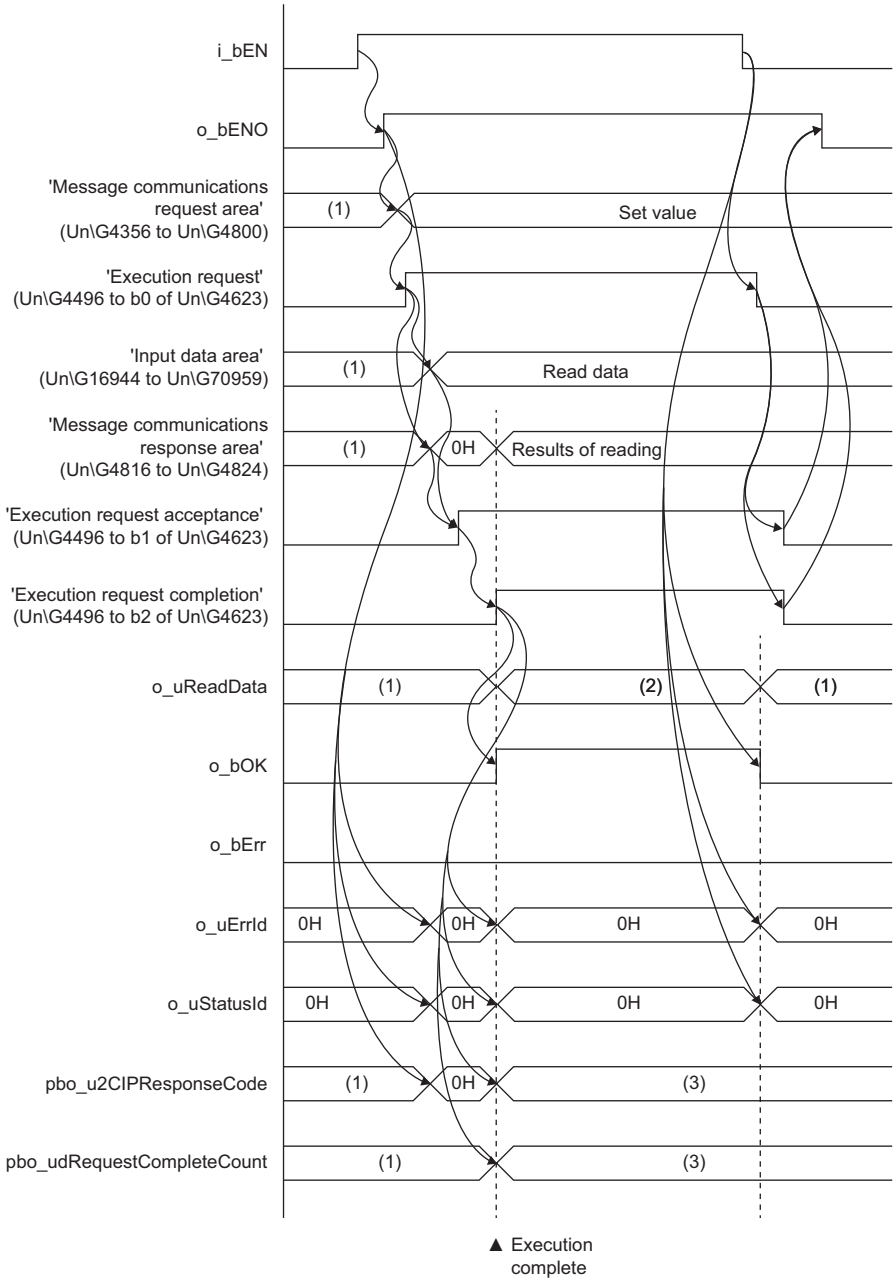
(2) Result of reading

(3) The last value is held.

(4) Read data is stored.

(5) Results storage area in the response area/stored value

■For normal completion when Trigger specification is set to Application Trigger



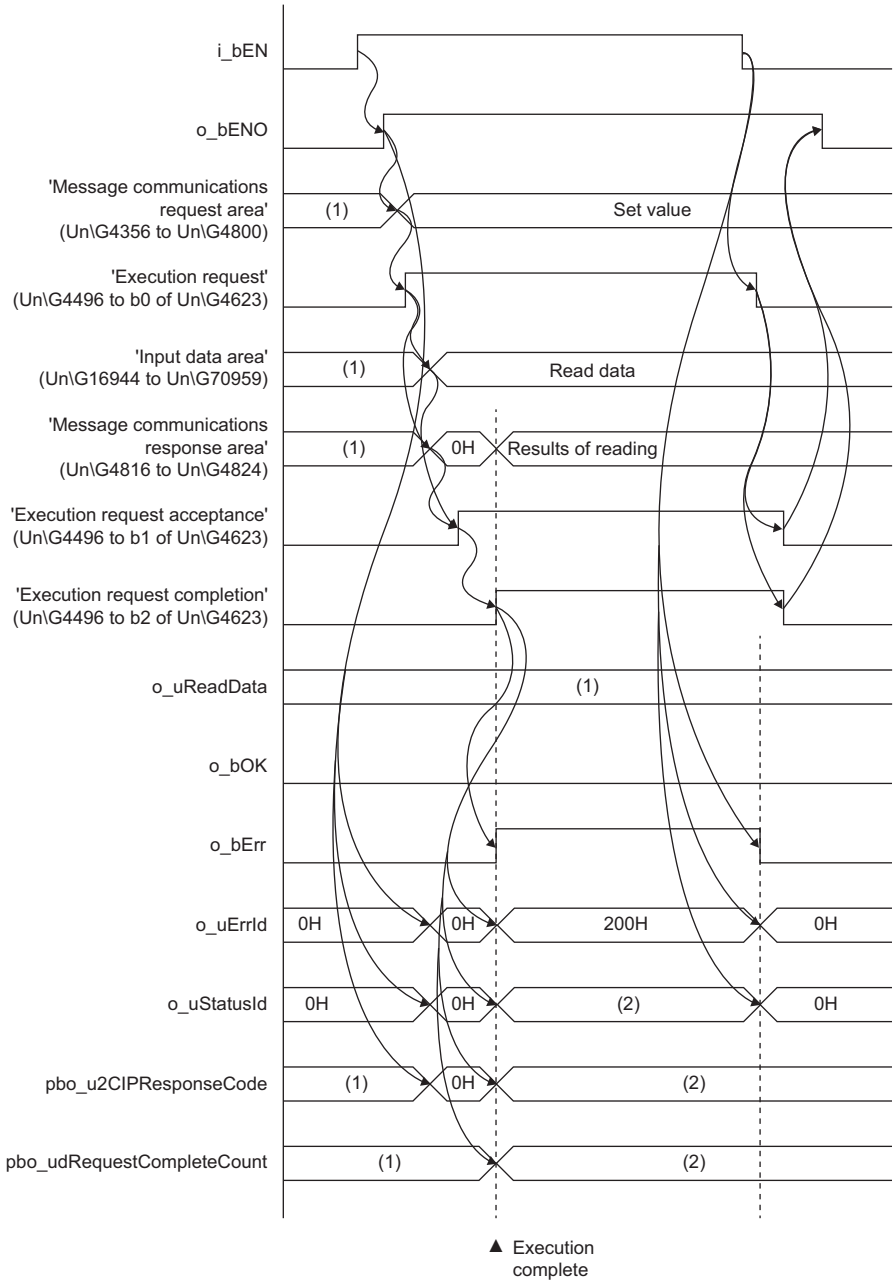
(1) The last value is held.

(2) Read data is stored.

(3) Results storage area in the response area/stored value

■For error completion when Trigger specification is set to Application Trigger

When a communication error occurs



(1) The last value is held.

(2) Results storage area in the response area/stored value

Restrictions or precautions

- Refer to o_uReadData (Read data storage device) when o_bOK (Normal completion) is turned on.
- Refer to o_uErrId (Error code) and o_uStatusId (Error code of communication error) when o_bErr (Error completion) is turned on.
- Do not turn off i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on. *1
- For the device where o_uReadData (Read data storage device) is to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*2 that has the same number as i_uRequestNo (Request No.).
  - 'Message communications execution request' (Un\G4496 to Un\G4623)
  - 'Message communications request/response area' (Un\G4656 to Un\G29231)
  - 'Input data area' (Un\G16944 to Un\G70959)
  - 'Output/message communications (server) data area' (Un\G63152 to Un\G109359)

*1 If i_bEN (Execution command) is turned off before o_bOK (Normal completion) or o_bErr (Error completion) is turned on, o_bErr (Error completion) is turned on while o_bENO (Execution status) is turned on and during the scan where the state of o_bENO (Execution status) is changed from off to on. Meanwhile, 113H (hexadecimal) is stored in o_uErrId (Error code).

*2 The 'n'th area of the buffer memory, where 'n' is the same number as i_uRequestNo (Request No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

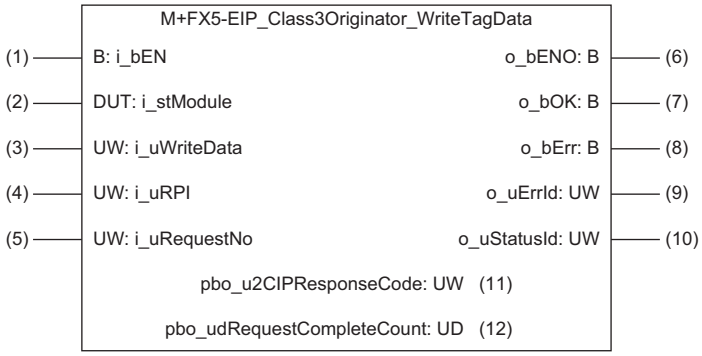
Error code

Error code	Description	Action
100H	The setting value of i_uRequestNo (Request No.) is invalid.	After reviewing the setting, re-execute the FB.
101H	The EtherNet/IP communications have stopped.	Set a value other than 0 for 'EtherNet/IP communications start request' (Un\G4272) and start the EtherNet/IP communications.
104H	An area where Class3 communications parameters are not set was used.	• Check the settings in "EtherNet/IP Configuration" of GX Works3 and check if the connection number for which Class3 communications parameters are set matches the number specified in i_uRequestNo (Request No.). • Check that the initial value in the area where Write is prohibited has not been changed using a ladder diagram or by other means within the request area of the message communications area (Request No. X).
105H	An area where a service other than Read service is set was used.	• Check the settings for "EtherNet/IP Configuration" of GX Works3 and check that the service ID is set to [Read service]. • Check that the initial value in the area where Write is prohibited has not been changed using a ladder diagram or by other means within the request area of the message communications area (Request No. X).
108H	EtherNet/IP communication has been suspended.	Set a value other than 0 for EtherNet/IP communications start request (Un\G4256) and re-execute the FB.
113H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on.
114H	The previous request is being executed.	Ensure that 'Message communications execution request' (Un\G4496 to Un\G4623) of the relevant connection is turned off, then execute again.
200H	A communication error has occurred.	Check the value stored in o_uStatusId (Error code of communication error) by referring to the following. (When o_uStatusId (Error code of communication error) is set to 01FFH, the CIP response code is stored in pbo_u2CIPResponseCode (CIP response code).) 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

5.7 M+FX5-EIP_Class3Originator_WriteTagData (Class3 tag communications data setting)

Overview

Sets data to the tag of the specified target device through the Class3 tag communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_uWriteData	Write data storage device	Word [unsigned]/bit string [16 bits]	Always	—	Data is written from the first area of the specified device to a tag of the target device. The type size of the written data is calculated as follows: Set size × Type size for the tag data type.*1
(4)	i_uRPI	RPI	Word [unsigned]/bit string [16 bits]	Always	0, 200 to 60000*2	Specify the send cycle. (Unit: millisecond) Specify 0 when not changing from the value set in "EtherNet/IP Configuration" of GX Works3.
(5)	i_uRequestNo	Request No.	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 128	Specify the connection number to acquire input data.*3 • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128

*1 For the send size and the tag name of the specification destination, set Class3 communications parameters in "EtherNet/IP Configuration" of GX Works3.
The type size is to be 1 word when the tag data type is set to INT, and 2 words when DINT.

*2 The operation is performed using the last value if a value out of range is set.

*3 Specify the same value as the connection number of the Class3 communications parameter set in "EtherNet/IP Configuration" of GX Works3.

Output labels

No.	Variable name	Name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(7)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(8)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(9)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(10)	o_uStatusId	Error code of communication error	Word [unsigned]/bit string [16 bits]	0	An error code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)).

Public variable

No.	Variable name	Name	Data type	Default value	Description
(11)	pbo_u2CIPResponseCode	CIP response code	Word [unsigned]/bit string [16 bits] (0..1)	0	The CIP response code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)). For details on the CIP response code, refer to the manual for the target device that sends the response command.
(12)	pbo_udRequestCompleteCount	Number of completed executions	Double word [unsigned]/bit string [32 bits]	0	The number of completed executions for Class3 tag communications is stored.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	1125 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 24 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

Processing

To perform Class3 tag communications, set Class3 communications parameters for the module using "EtherNet/IP Configuration" of GX Works3.

■When Trigger specification is set to Cyclic

- When i_bEN (Execution command) is turned on, data is periodically set for the tag of the specified target device through the Class3 tag communications.
- While i_bEN (Execution command) is turned on, the requested data is continuously updated to the value stored in i_uWriteData (Read data storage device).

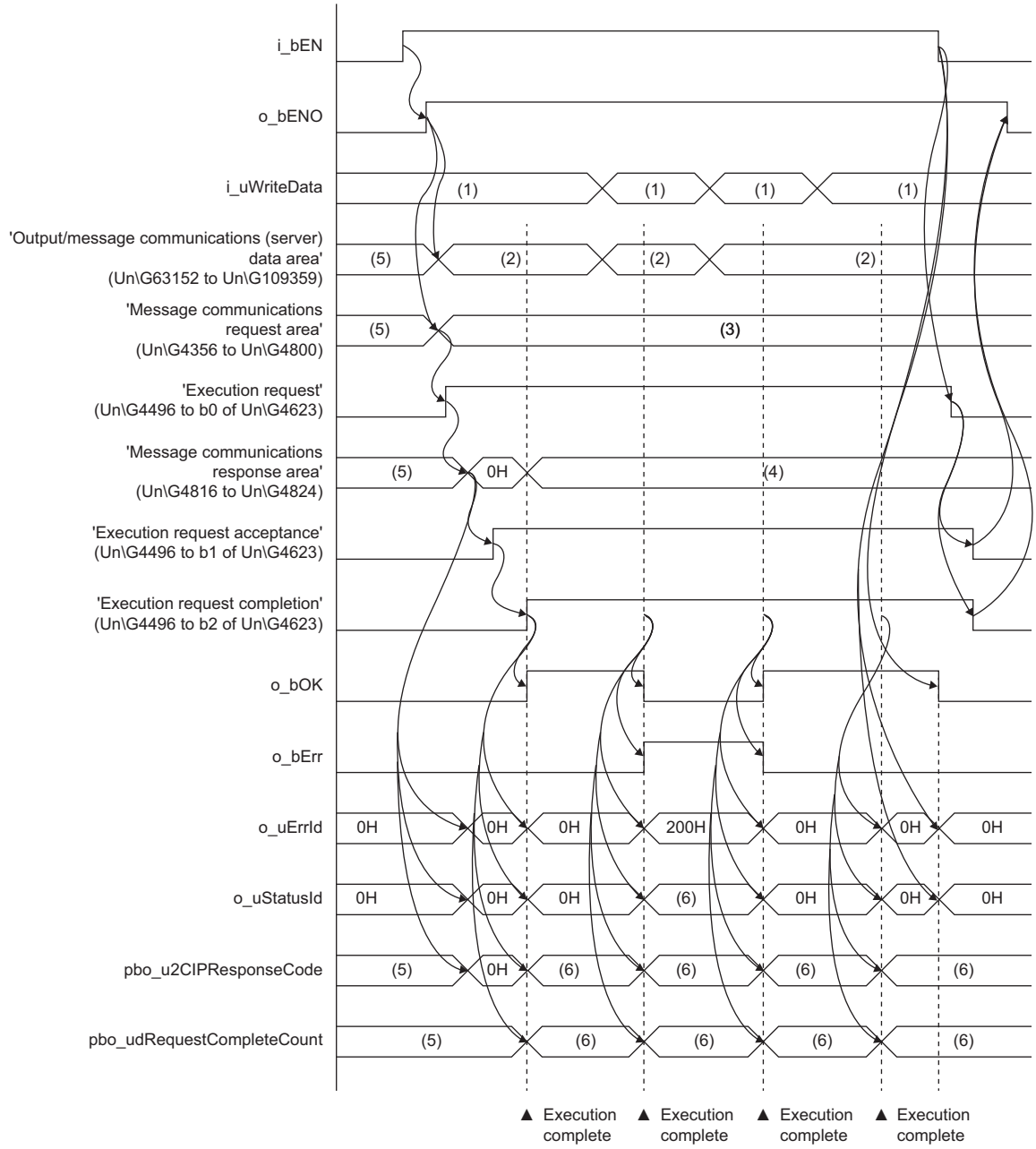
■When Trigger specification is set to Application Trigger

- When i_bEN (Execution command) is turned on, data is set for the tag of the specified target device through the Class3 tag communications.

Timing chart of I/O signals

■For normal completion when Trigger specification is set to Cyclic

When the operation is recovered after an error occurs for a certain time during communication



(1) Write data start address

(2) Write data is stored.

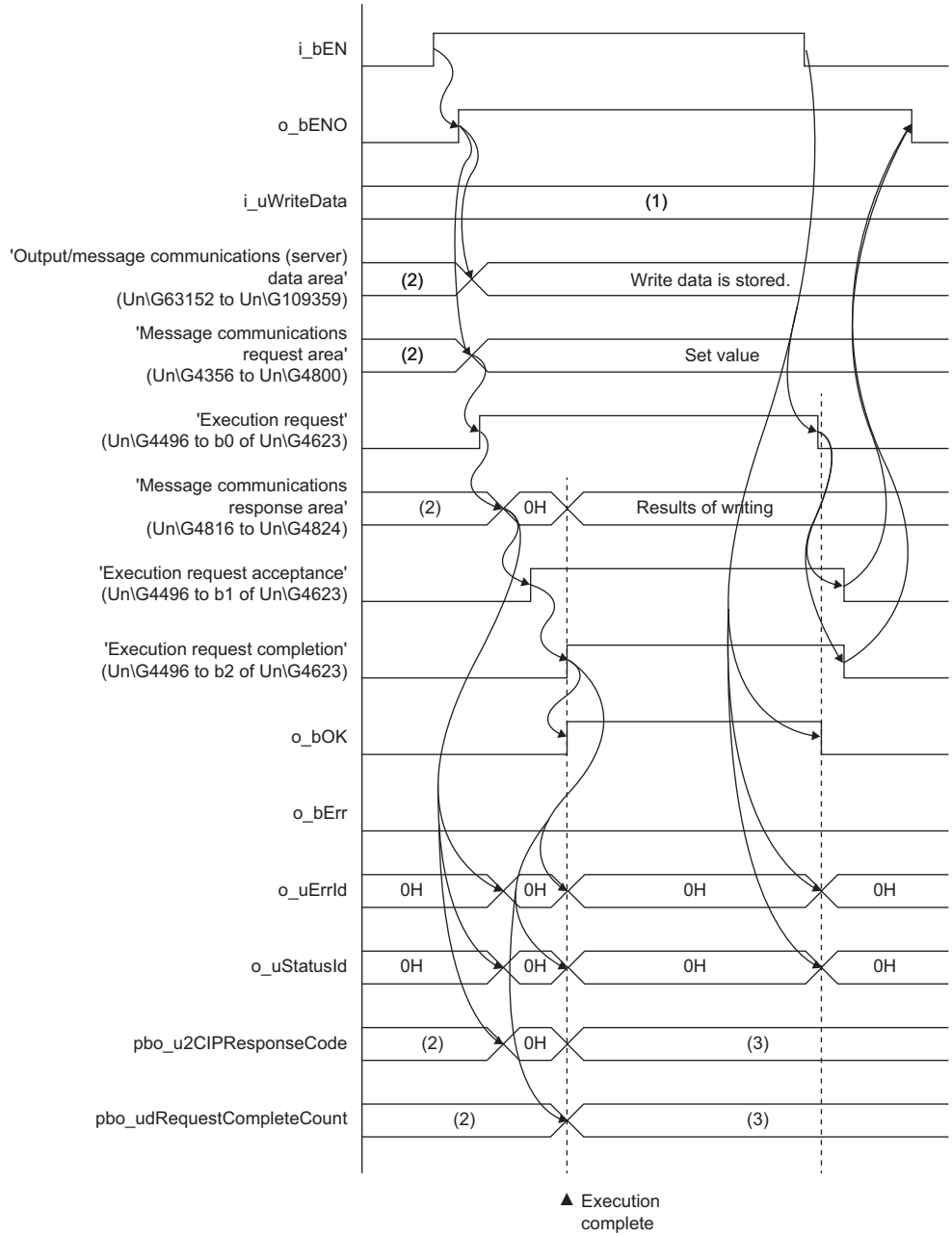
(3) Set value

(4) Results of writing

(5) The last value is held.

(6) Results storage area in the response area/stored value

■For normal completion when Trigger specification is set to Application Trigger



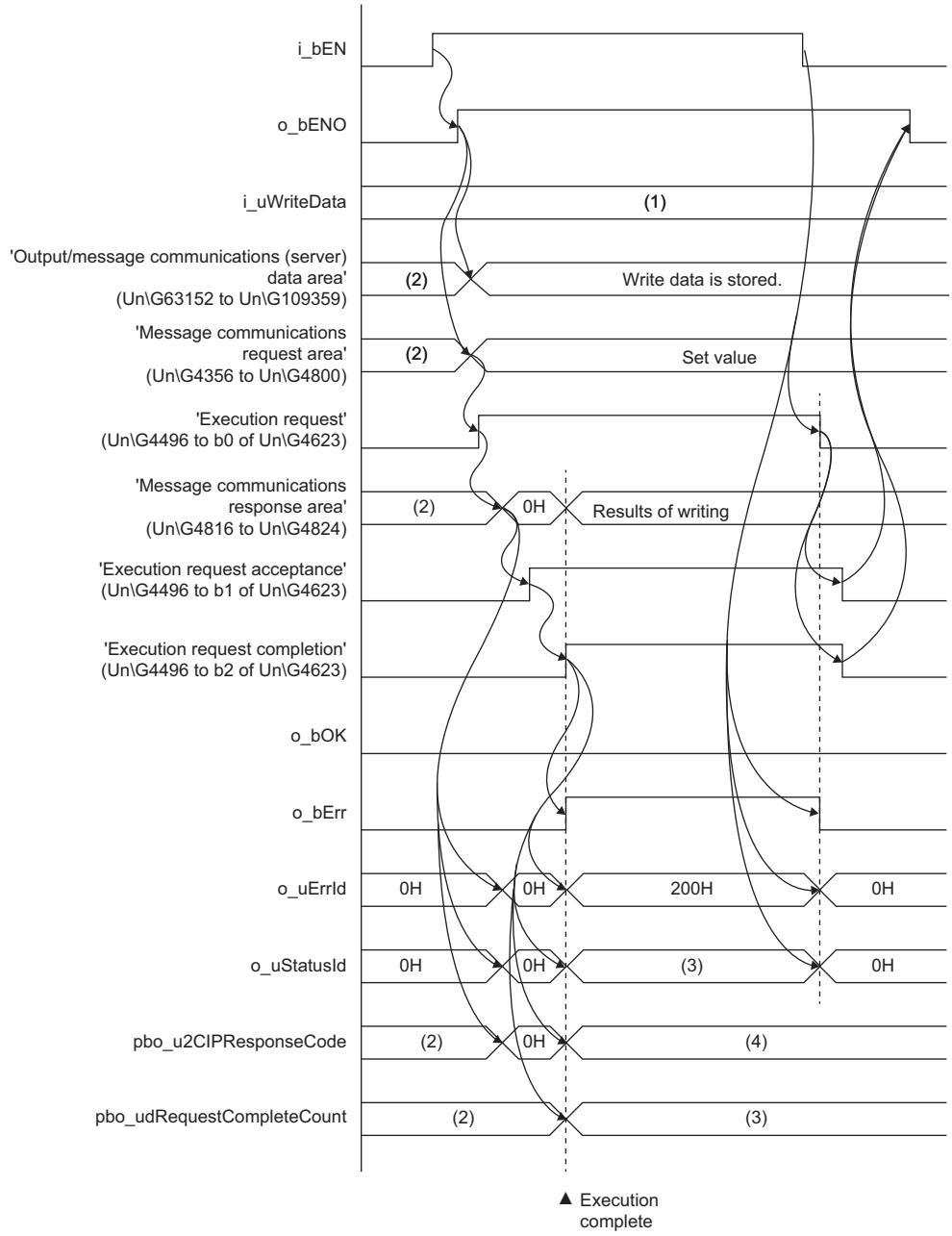
(1) Write data

(2) The last value is held.

(3) Results storage area in the response area/stored value

■For error completion when Trigger specification is set to Application Trigger

When a communication error occurs



(1) Write data

(2) The last value is held.

(3) Results storage area in the response area/stored value

(4) CIP response code

Restrictions or precautions

- Refer to o_uReadData (Read data storage device) when o_bOK (Normal completion) is turned on.
- Refer to o_uErrId (Error code) and o_uStatusId (Error code of communication error) when o_bErr (Error completion) is turned on.
- Do not turn off i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on. *1
- 3)For the device where i_uWriteData (Read data storage device) is to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*2 that has the same number as i_uRequestNo (Request No.).
  - 'Message communications execution request' (Un\G4496 to Un\G4623)
  - 'Message communications request/response area' (Un\G4656 to Un\G29231)
  - 'Input data area' (Un\G16944 to Un\G70959)
  - 'Output/message communications (server) data area' (Un\G63152 to Un\G109359)

*1 If i_bEN (Execution command) is turned off before o_bOK (Normal completion) or o_bErr (Error completion) is turned on, o_bErr (Error completion) is turned on while o_bENO (Execution status) is turned on and during the scan where the state of o_bENO (Execution status) is changed from off to on. Meanwhile, 113H (hexadecimal) is stored in o_uErrId (Error code).

*2 The 'n'th area of the buffer memory, where 'n' is the same number as i_uRequestNo (Request No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

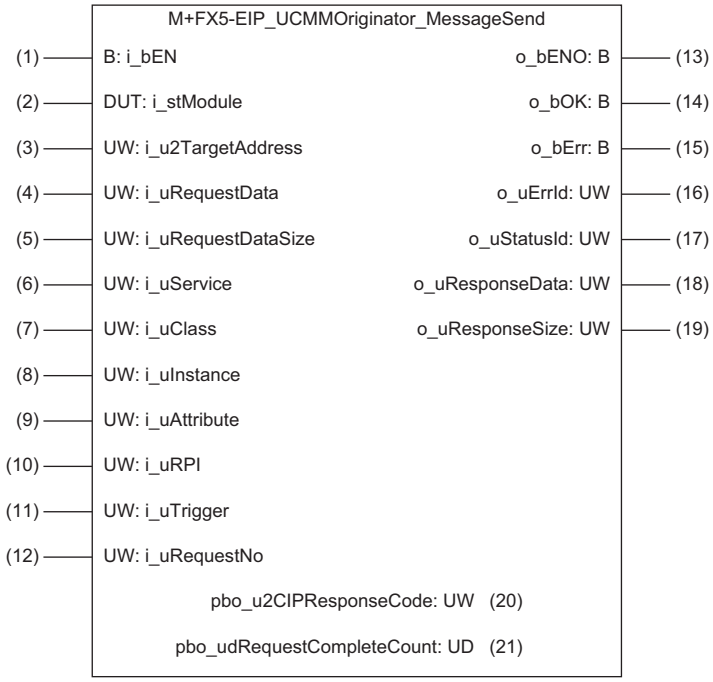
Error code

Error code	Description	Action
100H	The setting value of i_uRequestNo (Request No.) is invalid.	After reviewing the setting, re-execute the FB.
101H	The EtherNet/IP communications have stopped.	Set a value other than 0 for 'EtherNet/IP communications start request' (Un\G272) and start the EtherNet/IP communications.
104H	An area where Class3 communications parameters are not set was used.	• Check the settings in "EtherNet/IP Configuration" of GX Works3 and check if the connection number for which Class3 communications parameters are set matches the number specified in i_uRequestNo (Request No.). • Check that the initial value in the area where Write is prohibited has not been changed using a ladder diagram or by other means within the request area of the message communications area (Request No. X).
106H	An area where a service other than Write service is set was used.	• Check the settings for "EtherNet/IP Configuration" of GX Works3 and check that the service ID is set to [Write service]. • Check if the initial value for the area of Request No. has been changed using a ladder diagram or by other means.
108H	EtherNet/IP communication has been suspended.	Set a value other than 0 for EtherNet/IP communications start request (Un\G4256) and re-execute the FB.
113H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on.
114H	The previous request is being executed.	Ensure that 'Message communications execution request' (Un\G4496 to Un\G4623) of the relevant connection is turned off, then execute again.
200H	A communication error has occurred in the target connection.	Check the value stored in o_uStatusId (Error code of communication error) by referring to the following. (When o_uStatusId (Error code of communication error) is set to 01FFH, the CIP response code is stored in pbo_u2CIPResponseCode (CIP response code).) 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

5.8 M+FX5-EIP_UCMMOriginator_MessageSend (Sending of UCMM communications message)

Overview

Sends a message to the specified target device through the UCMM instance communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_u2TargetAddress	IP address	Word [unsigned]/bit string [16 bits] (0..1)	Only when the FB is activated	—	Specify the IP address of the target device.
(4)	i_uRequestData	Request data storage device	Word [unsigned]/bit string [16 bits]	Always	—	As the request data to be used for the service, data (request data size ÷ 2 (value is rounded up)) is sent to the target device specified with the IP address from the start of the device specified here. However, when the request data size is an odd number, only the lower 8 bits are sent as the final area.
(5)	i_uRequestDataSize	Request data size	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	0 to 496[*1]	Specify the request data size. (Unit: byte) Specify 0 when request data does not exist. The settable maximum value decreases according to the parameters set for the FB. • When Class is set to 0100H to FFFFH, • When Instance is set to 0100H to FFFFH, and • When Attribute is set to 0100H to FFFFH, the value decreases by 2.[*2]

No.	Variable name	Name	Data type	Import	Range	Description
(6)	i_uService	Service	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	0 to 255	Set the service code to be used. Only the values in the lower 8 bits are valid in this area. The values set for the upper 8 bits are ignored.
(7)	i_uClass	Class	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	—	Specify the class ID to be the target.
(8)	i_uInstance	Instance	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	—	Specify the instance ID to be the target.
(9)	i_uAttribute	Attribute	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	—	Specify the attribute ID to be the target.
(10)	i_uRPI	RPI	Word [unsigned]/bit string [16 bits]	Always	200 to 60000	■When Trigger specification is set to Cyclic Specify the send cycle. (Unit: millisecond) ■When Trigger specification is set to Application Trigger Settings are not required. (Any settings are ignored.)
(11)	i_uTrigger	Trigger specification	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	0000H 0010H	Specify the send trigger. • 0000H: Application Trigger • 0010H: Cyclic
(12)	i_uRequestNo	Request No.	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 128	Specify the connection number to acquire input data.*3 • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128

*1 When 0 is set, i_uRequestData (Request data storage device) is not required to be set.

*2 For details on the settable range of this parameter, refer to the following.
MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

*3 Do not specify a request No. that is the same as the connection number in Class3 communications parameters set in "EtherNet/IP Configuration" of GX Works3. Specify a request No. that is not set in Class3 communications parameters.

Output labels

No.	Variable name	Name	Data type	Default value	Description
(13)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(14)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(15)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(16)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(17)	o_uStatusId	Error code of communication error	Word [unsigned]/bit string [16 bits]	0	An error code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)).
(18)	o_uResponseData	Response data storage device	Word [unsigned]/bit string [16 bits]	0	Data (response data size ÷ 2 (value is rounded up)) is stored from the start of the device specified with the response data for the requested service. However, when the response data size is an odd number, the data stored in the final area includes only the lower 8 bits.
(19)	o_uResponseSize	Response data size	Word [unsigned]/bit string [16 bits]	0	The size of the received response data is stored. (Unit: byte)

Public variable

No.	Variable name	Name	Data type	Default value	Description
(20)	pbo_u2CIPResponseCode	CIP response code	Word [unsigned]/bit string [16 bits] (0..1)	0	The CIP response code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)). For details on the CIP response code, refer to the manual for the target device that sends the response command.
(21)	pbo_udRequestCompleteCount	Number of completed executions	Double word [unsigned]/bit string [32 bits]	0	The number of times the requested execution is completed for UCMM instance communications is stored.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	1566 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 40 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

Processing

■When Trigger specification is set to Cyclic

- When i_bEN (Execution command) is turned on, a message is periodically sent to the specified target device through the UCMM instance communications.
- While i_bEN (Execution command) and o_bOK (Normal completion) are on, the data of i_uRequestData (Request data storage device) is sent in the message and the response data is continuously stored in o_uResponseData (Response data storage device).

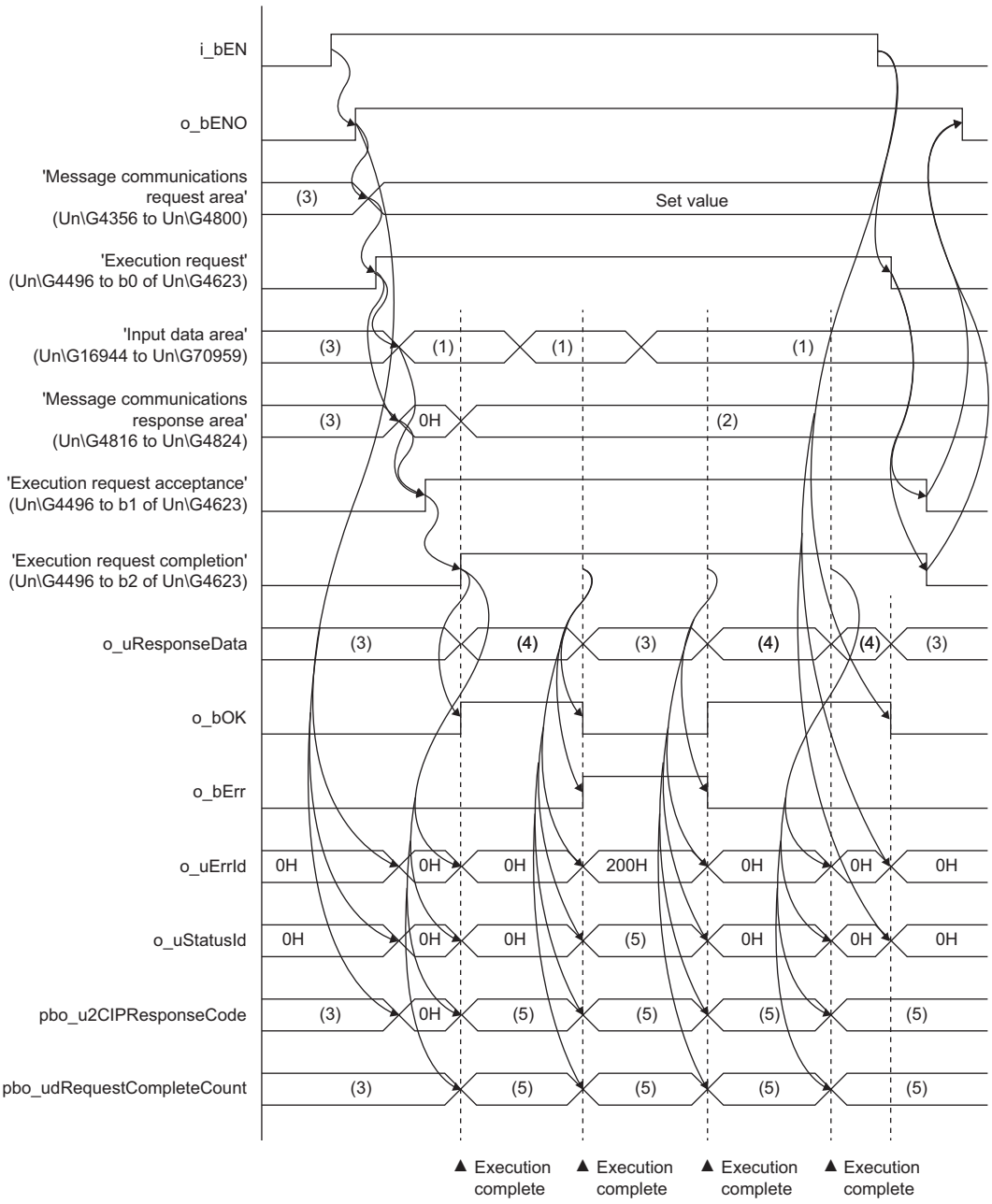
■When Trigger specification is set to Application Trigger

- When i_bEN (Execution command) is turned on, a message is sent to the specified target device through the UCMM instance communications.

Timing chart of I/O signals

■For normal completion when Trigger specification is set to Cyclic

When the operation is recovered after an error occurs for a certain time during communication



(1) Read data

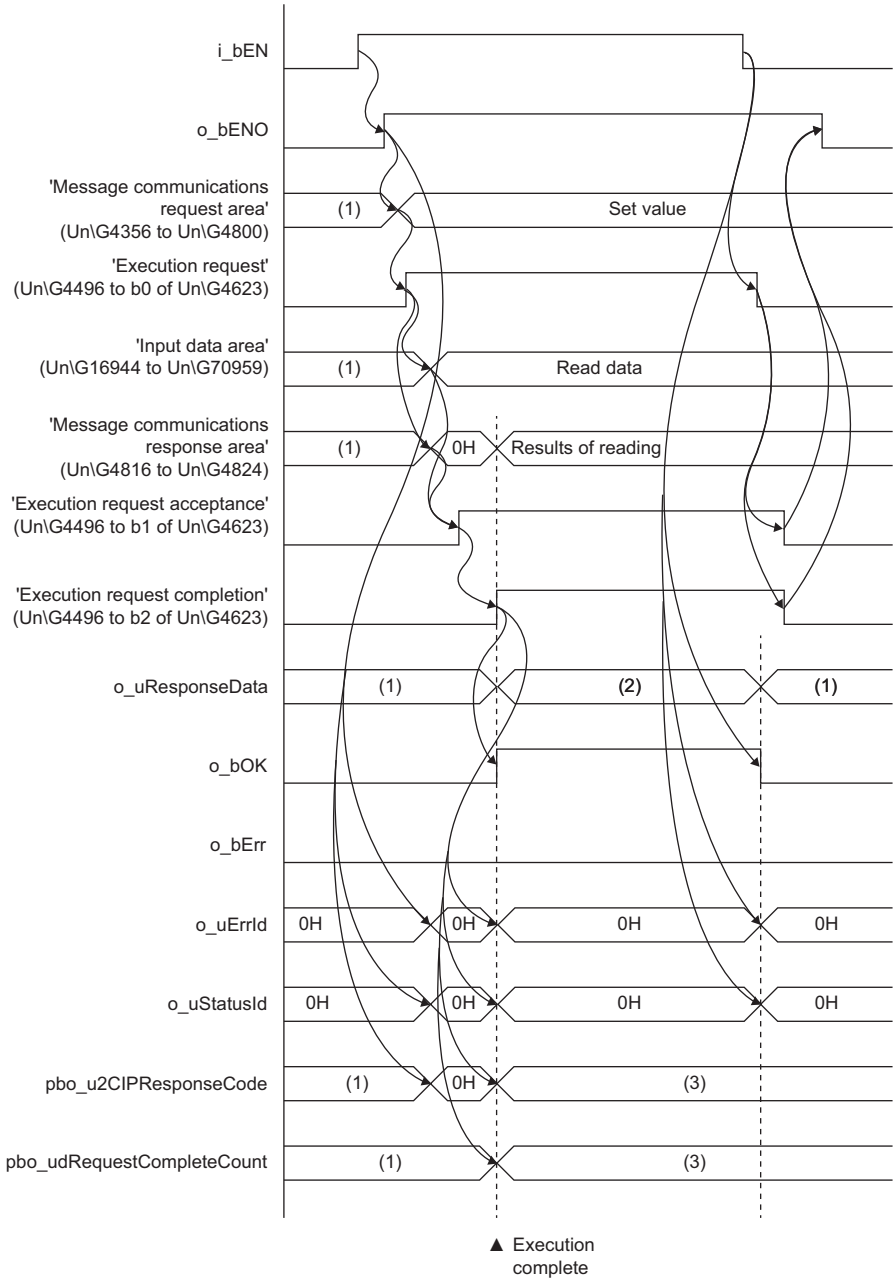
(2) Result of reading

(3) The last value is held.

(4) Response data is stored.

(5) Results storage area in the response area/stored value

■For normal completion when Trigger specification is set to Application Trigger



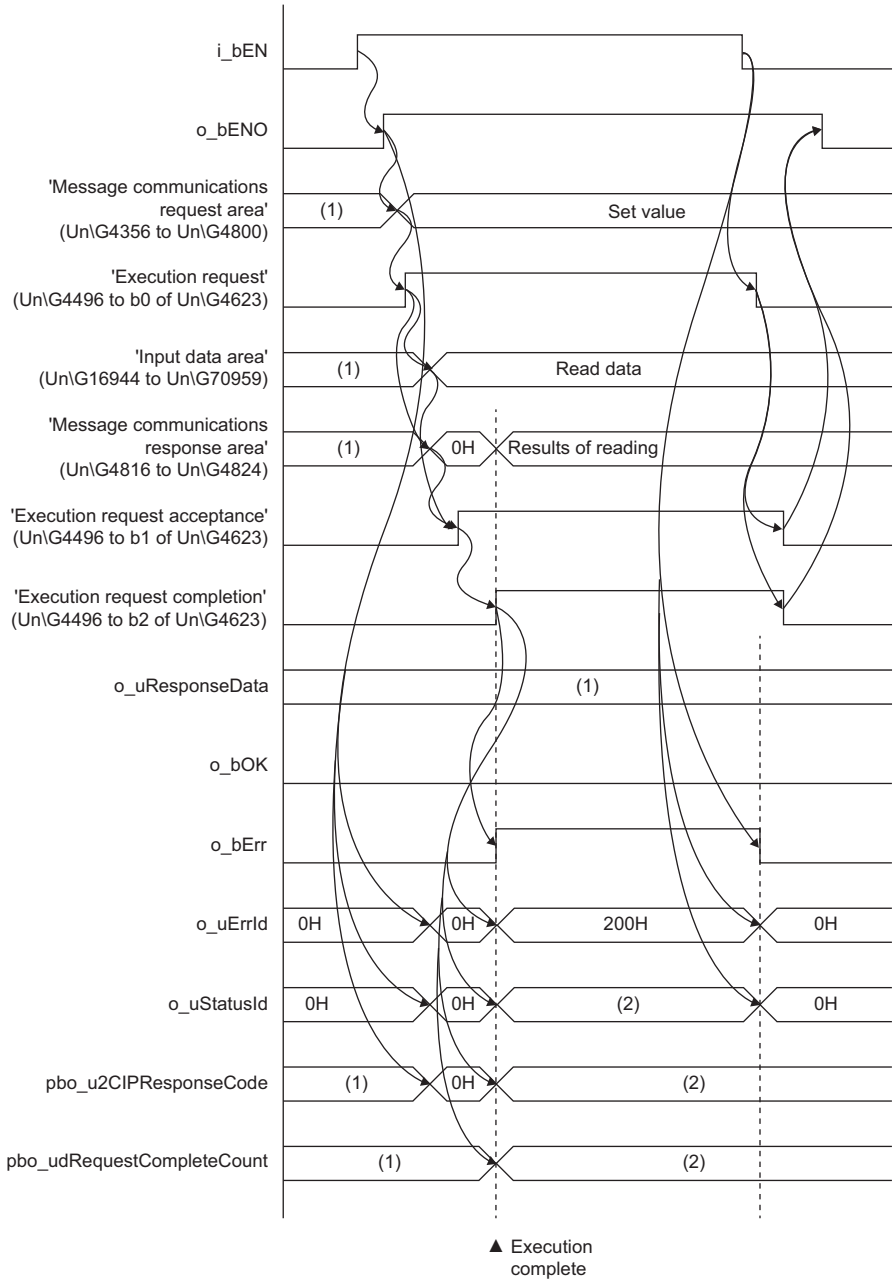
(1) The last value is held.

(2) Response data is stored.

(3) Results storage area in the response area/stored value

■For error completion when Trigger specification is set to Application Trigger

When a communication error occurs



(1) The last value is held.

(2) Results storage area in the response area/stored value

Restrictions or precautions

- Refer to o_uResponseData (Response data storage device) when o_bOK (Normal completion) is turned on.
- Refer to o_uErrId (Error code) and o_uStatusId (Error code of communication error) when o_bErr (Error completion) is turned on.
- Do not turn off i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on. *1
- For the device where i_uRequestData (Request data storage device) and o_uResponseData (Response data storage device) are to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For the communication data size, refer to the manual for the target device. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*2 that has the same number as i_uRequestNo (request No.).
  - 'Message communications execution request' (Un\G4496 to Un\G4623)
  - 'Message communications request/response area' (Un\G4656 to Un\G29231)
  - 'Input data area' (Un\G16944 to Un\G70959)
  - 'Output/message communications (server) data area' (Un\G63152 to Un\G109359)

*1 If i_bEN (Execution command) is turned off before o_bOK (Normal completion) or o_bErr (Error completion) is turned on, o_bErr (Error completion) is turned on while o_bENO (Execution status) is turned on and during the scan where the state of o_bENO (Execution status) is changed from off to on. Meanwhile, 113H (hexadecimal) is stored in o_uErrId (Error code).

*2 The 'n'th area of the buffer memory, where 'n' is the same number as i_uRequestNo (Request No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

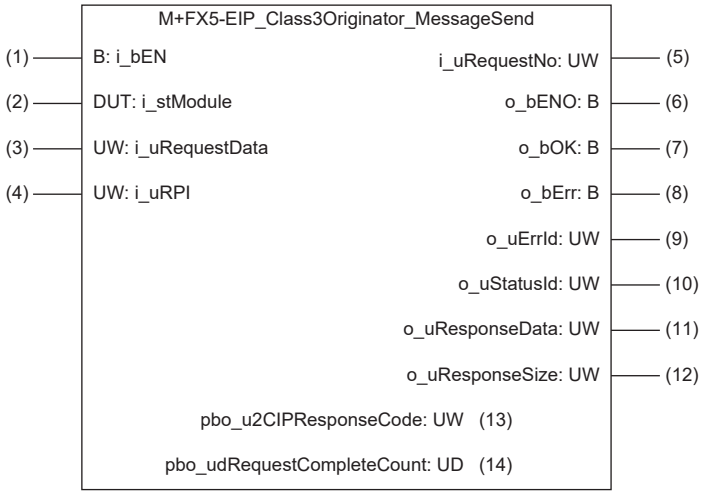
Error code

Error code	Description	Action
100H	The value of i_uRequestNo (Request No.) is out of range.	After reviewing the setting, re-execute the FB.
101H	The EtherNet/IP communications have stopped.	Set a value other than 0 for 'EtherNet/IP communications start request' (Un\G252) and start the EtherNet/IP communications.
103H	UCMM used an inappropriate area.	• Check if the Class1 communications and Class3 communications are used in Request No. • Check if the initial value for the area of Request No. has been changed using a ladder diagram or by other means.
108H	EtherNet/IP communication has been suspended.	Set a value other than 0 for EtherNet/IP communications start request (Un\G4256) and re-execute the FB.
113H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on.
114H	The previous request is being executed.	Ensure that 'Message communications execution request' (Un\G4496 to Un\G4623) of the relevant connection is turned off, then execute again.
200H	A communication error has occurred.	Check the value stored in o_uStatusId (Error code of communication error) by referring to the following. (When o_uStatusId (Error code of communication error) is set to 01FFH, the CIP response code is stored in pbo_u2CIPResponseCode (CIP response code).) If o_uStatusId (Error code of communication error) is 0010H, check the value of the request data size. 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

5.9 M+FX5-EIP_Class3Originator_MessageSend (Sending of Class3 communications message)

Overview

Sends a message to the specified target device through the Class3 instance communications.



Labels

Input label

No.	Variable name	Name	Data type	Import	Range	Description
(1)	i_bEN	Execution command	Bit	Always	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	Only when the FB is activated	—	Specifies the module label of the FX5-EIP.
(3)	i_uRequestData	Request data storage device	Word [unsigned]/bit string [16 bits]	Always	—	As the request data to be used for the service, data (request data size ÷ 2 (value is rounded up)) is sent to the specified target device from the start of the device specified here. However, when the request data size is an odd number, the data sent from the final area includes only the lower 8 bits.*1
(4)	i_uRPI	RPI	Word [unsigned]/bit string [16 bits]	Always	0, 200 to 60000*2	Specify the send cycle. (Unit: millisecond) Specify 0 when not changing from the value set in "EtherNet/IP Configuration" of GX Works3.
(5)	i_uRequestNo	Request No.	Word [unsigned]/bit string [16 bits]	Only when the FB is activated	1 to 128	Specify the connection number to acquire input data.*3 • When the maximum number of the connection is 64: 1 to 64 • When the maximum number of the connection is 128: 1 to 128

*1 For the service to use, request data size, and external device, set Class3 communications parameters in "EtherNet/IP Configuration" of GX Works3.

*2 The operation is performed using the last value if a value out of range is set.

*3 Specify the same value as the connection number of the Class3 communications parameter set in "EtherNet/IP Configuration" of GX Works3.

Output labels

No.	Variable name	Name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	Off	On: The execution command is on. Off: The execution command is off.
(7)	o_bOK	Normal completion	Bit	Off	The on state indicates that the FB has been completed successfully.
(8)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(9)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(10)	o_uStatusId	Error code of communication error	Word [unsigned]/bit string [16 bits]	0	An error code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)).
(11)	o_uResponseData	Response data storage device	Word [unsigned]/bit string [16 bits]	0	Data (response data size ÷ 2 (value is rounded up)) is stored from the start of the device specified with the response data for the requested service. However, when the response data size is an odd number, the data stored in the final area includes only the lower 8 bits.
(12)	o_uResponseSize	Response data size	Word [unsigned]/bit string [16 bits]	0	The size of the received response data is stored. (Unit: byte)

Public variable

No.	Variable name	Name	Data type	Default value	Description
(13)	pbo_u2CIPResponseCode	CIP response code	Word [unsigned]/bit string [16 bits]	0	The CIP response code is stored when a communication error has occurred (when 200H is stored in o_uErrId (error code)). For details on the CIP response code, refer to the manual for the target device that sends the response command.
(14)	pbo_udRequestCompleteCount	Number of completed executions	Double word [unsigned]/bit string [32 bits]	0	The number of completed executions for Class3 tag communications is stored.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-EIP	—	GX Works3 with version 1.120A or later

■CPU module

Target module	Firmware version	Engineering tool
MX Controller (MX-F Model)	106 or later	GX Works3 with version 1.120A or later
FX5UJ	1.100 or later	GX Works3 with version 1.120A or later
FX5U, FX5UC	1.340 or later	GX Works3 with version 1.120A or later

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	1377 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Label usage	• Label: 40 points (Word) • Latch label: 0 points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument, and the option setting of GX Works3. For the option setting of GX Works3, refer to the GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

Processing

To perform Class3 instance communications, set Class3 communications parameters for the module using "EtherNet/IP Configuration" of GX Works3.

■When Trigger specification is set to Cyclic

- When i_bEN (Execution command) is turned on, a message is periodically sent to the specified target device through the Class3 instance communications.
- While i_bEN (Execution command) and o_bOK (Normal completion) are on, the data of i_uRequestData (Request data storage device) is sent in the message and the response data is continuously stored in o_uResponseData (Response data storage device).

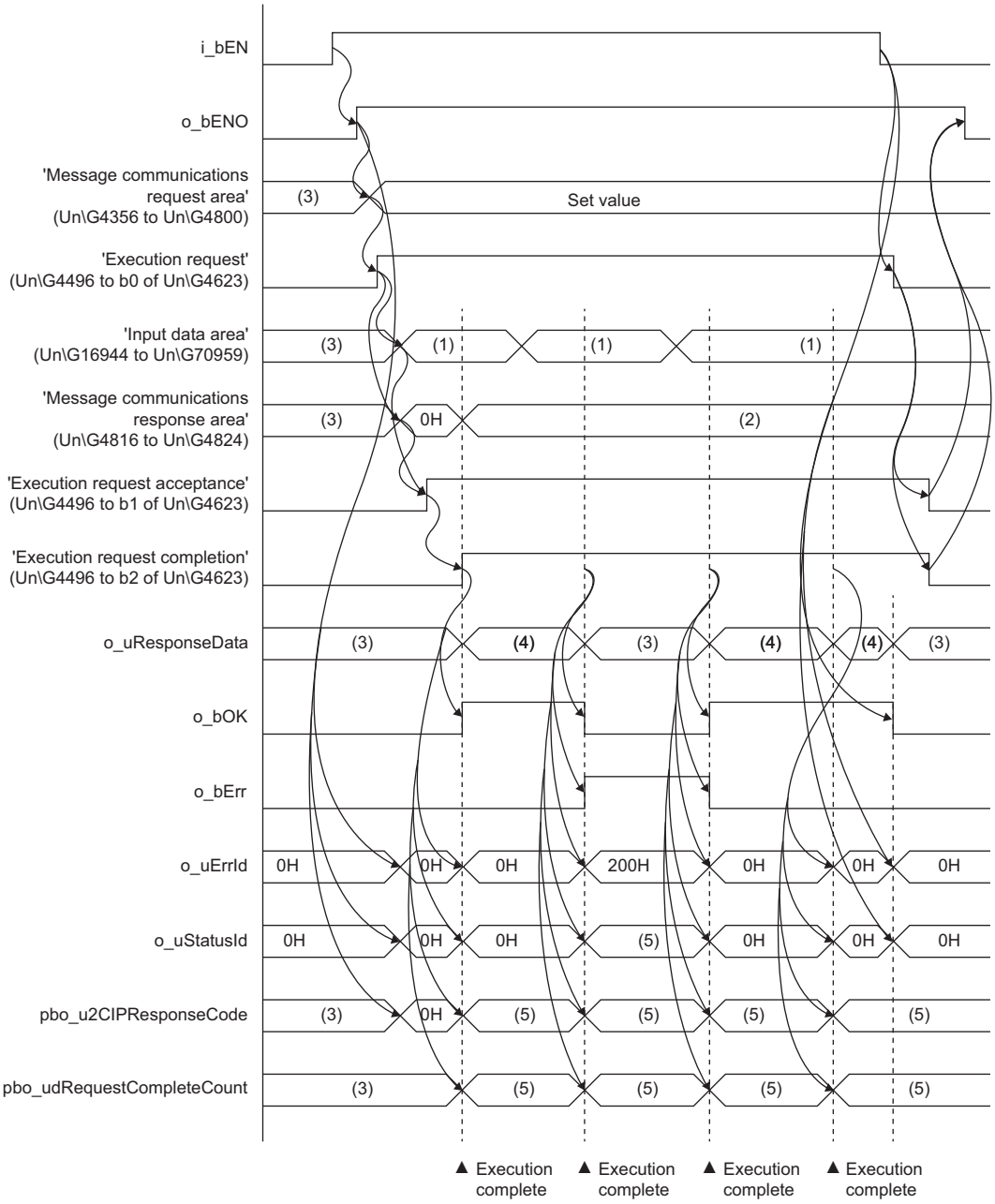
■When Trigger specification is set to Application Trigger

- When i_bEN (Execution command) is turned on, a message is sent to the specified target device through the Class3 instance communications.

Timing chart of I/O signals

■For normal completion when Trigger specification is set to Cyclic

When the operation is recovered after an error occurs for a certain time during communication



(1) Read data

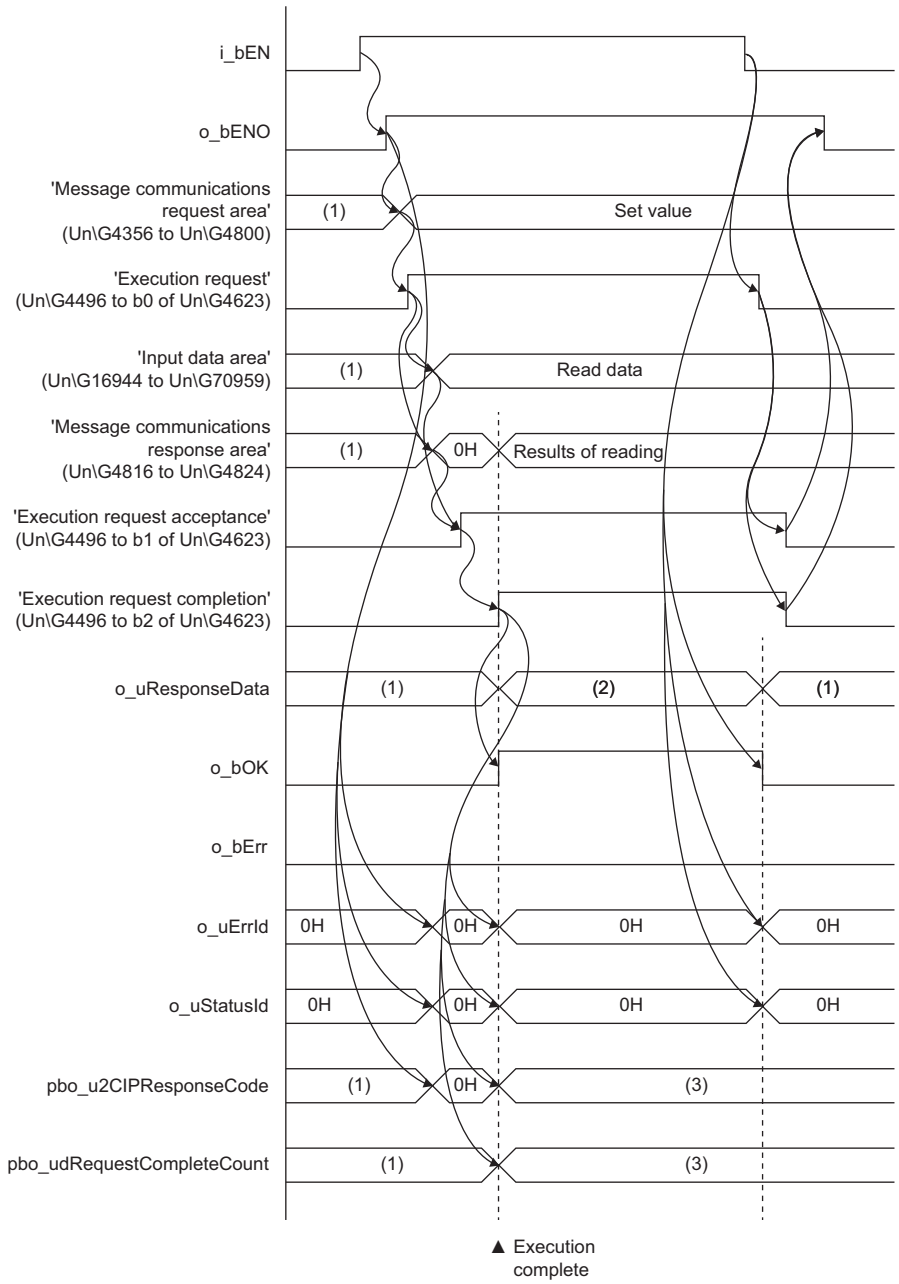
(2) Result of reading

(3) The last value is held.

(4) Response data is stored.

(5) Results storage area in the response area/stored value

■For normal completion when Trigger specification is set to Application Trigger



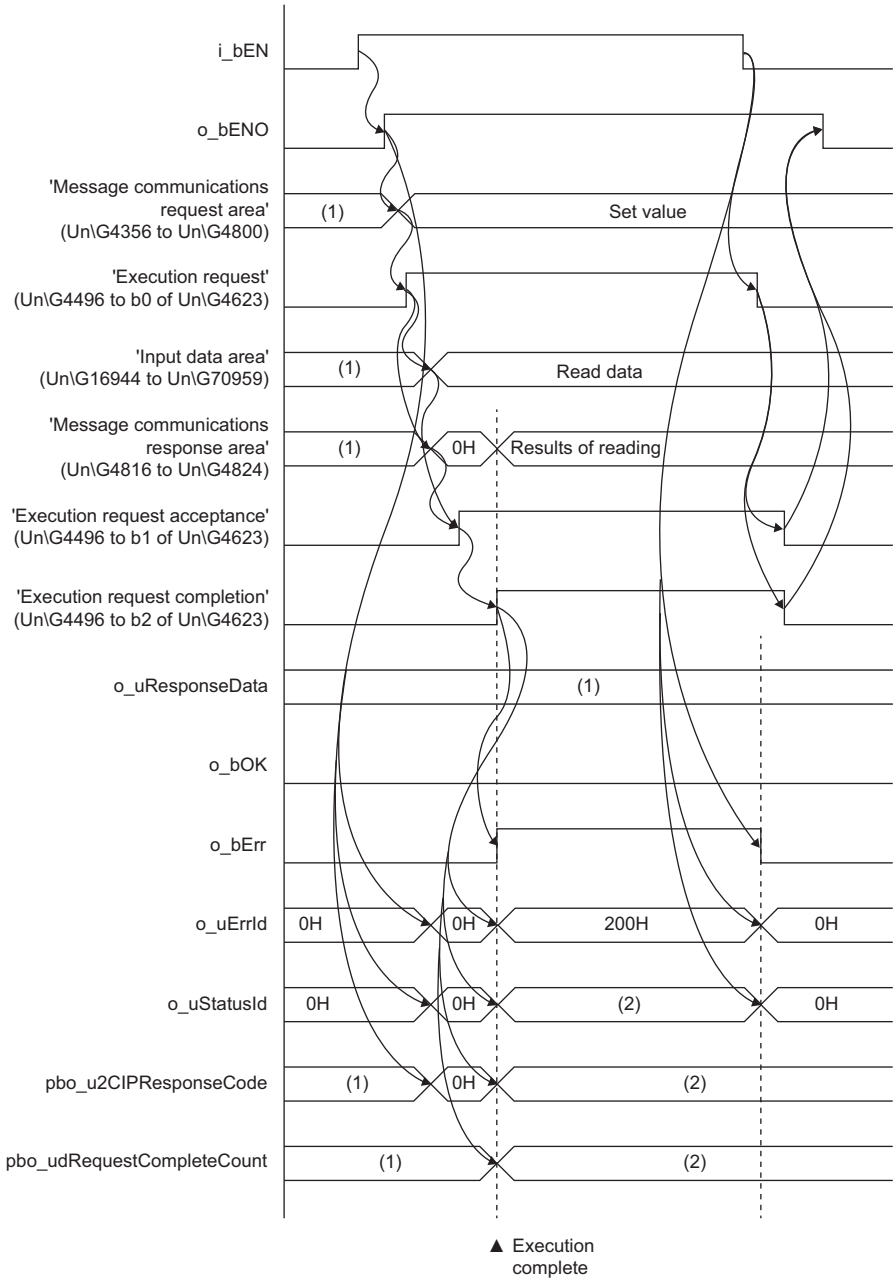
(1) The last value is held.

(2) Response data is stored.

(3) Results storage area in the response area/stored value

■For error completion when Trigger specification is set to Application Trigger

When a communication error occurs



(1) The last value is held.

(2) Results storage area in the response area/stored value

Restrictions or precautions

- Refer to o_uResponseData (Response data storage device) when o_bOK (Normal completion) is turned on.
- Refer to o_uErrId (Error code) and o_uStatusId (Error code of communication error) when o_bErr (Error completion) is turned on.
- Do not turn off i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on. *1
- 4)For the device where i_uRequestData (Request data storage device) and o_uResponseData (Response data storage device) are to be set, ensure that it has a sufficient size to prevent overlap and does not access areas out of range. If the device accesses an area out of range, an unexpected value may be set or a CPU error may occur. For the communication data size, refer to the manual for the target device. For details, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.
- This FB performs operations using the following buffer memory areas. Therefore, during the execution of this FB, do not execute any operation other than this FB using a buffer memory area*2 that has the same number as i_uRequestNo (request No.).
  - 'Message communications execution request' (Un\G4496 to Un\G4623)
  - 'Message communications request/response area' (Un\G4656 to Un\G29231)
  - 'Input data area' (Un\G16944 to Un\G70959)
  - 'Output/message communications (server) data area' (Un\G63152 to Un\G109359)

*1 o_bErr (Error completion) is turned on while o_bENO (Execution status) is turned on and during the scan where the state of o_bENO (Execution status) is changed from off to on.

*2 The 'n'th area of the buffer memory, where 'n' is the same number as i_uRequestNo (Request No.) of this FB

Parameter setting

Set the parameters for the EtherNet/IP communications using GX Works3.

Configure settings separately for the originator (the side that requests connection establishment) and the target (the side that receives the connection establishment request).

For the parameter setting, refer to the 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual.

Error code

Error code	Description	Action
100H	The value of i_uRequestNo (Request No.) is out of range.	After reviewing the setting, re-execute the FB.
101H	The EtherNet/IP communications have stopped.	Set a value other than 0 for 'EtherNet/IP communications start request' (Un\G272) and start the EtherNet/IP communications.
104H	An area where Class3 communications parameters are not set was used.	• Check the settings in "EtherNet/IP Configuration" of GX Works3 and check if the connection number for which Class3 communications parameters are set matches the number specified in i_uRequestNo (Request No.). • Check that the initial value in the area where Write is prohibited has not been changed using a ladder diagram or by other means within the request area of the message communications area (Request No. X).
107H	An area where communications other than Class3 instance communications is set was used.	• Check the settings for "EtherNet/IP Configuration" of GX Works3 and check that instance communications are set. • Check that the initial value in the area where Write is prohibited has not been changed using a ladder diagram or by other means within the request area of the message communications area (Request No. X).
108H	EtherNet/IP communication has been suspended.	Set a value other than 0 for EtherNet/IP communications start request (Un\G4256) and re-execute the FB.
113H	i_bEN (Execution command) was turned off during the processing.	Maintain the on state of i_bEN (Execution command) until o_bOK (Normal completion) or o_bErr (Error completion) is turned on.
114H	The previous request is being executed.	Ensure that 'Message communications execution request' (Un\G4496 to Un\G4623) of the relevant connection is turned off, then execute again.
200H	A communication error has occurred.	Check the value stored in o_uStatusId (Error code of communication error) by referring to the following. (When o_uStatusId (Error code of communication error) is set to 01FFH, the CIP response code is stored in pbo_u2CIPResponseCode (CIP response code).) If o_uStatusId (Error code of communication error) is 0010H, check the value of the request data size. 📖MELSEC iQ-F FX5-EIP EtherNet/IP Module User's Manual

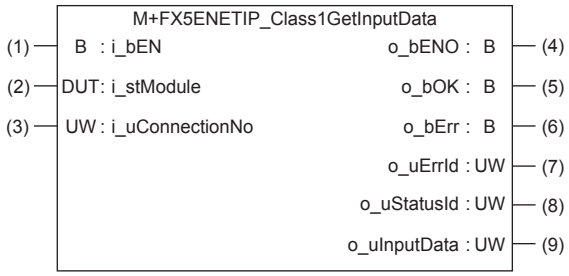
6 FB FOR EtherNet/IP (FX5-ENET/IP)

This chapter describes the FBs dedicated to the FX5-ENET/IP.
Up to one FX5-ENET/IP can be connected. The module cannot be used with the FX5-EIP.
For details, refer to the following.
MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)

6.1 M+FX5ENETIP_Class1GetInputData (Class1 communications input data acquisition)

Overview

This FB acquires the input data of the specified connection by Class1 communication.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-ENET/IP.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 32	Specify the number of the connection where the input data is acquired.

Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	Off	Outputs the execution state of the FB. • On: Executed • Off: Not executed
(5)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that communication is established.
(6)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(7)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(8)	o_uStatusId	Error code of connection communication error	Word [Unsigned]/Bit String [16-bit]	0	When a connection communication error occurs (200 (hexadecimal) is stored in o_uErrId (Error code)), an error code is stored in o_uStatusId (Error code of connection communication error).
(9)	o_uInputData	Input data storage device	Word [Unsigned]/Bit String [16-bit]	0	Specifies the head number of the device where the input data is stored.

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-ENET/IP	—	GX Works3 with version 1.050C or later

■CPU module

FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	471 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.02K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

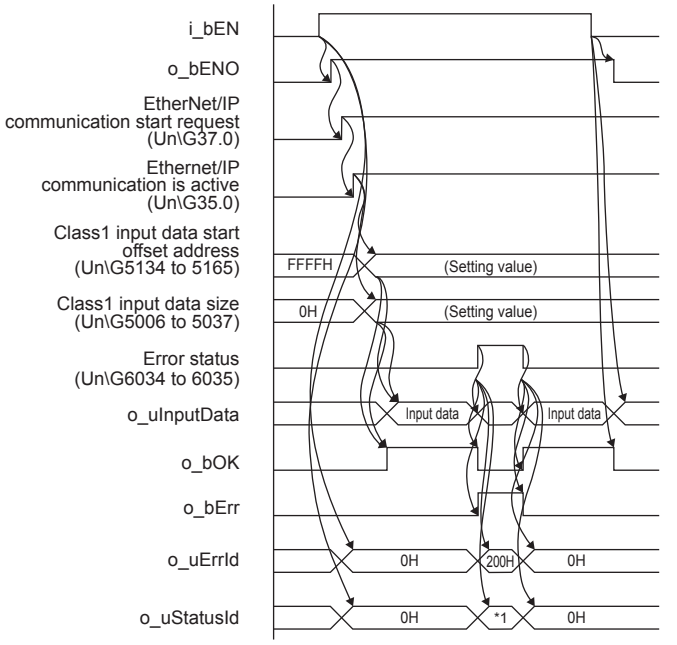
Processing

- By turning i_bEN (Execution command) on, the input data of the specified connection is acquired by Class1 communication.
- The input data is continuously stored in o_uInputData (Input data storage device) while i_bEN (Execution command) and o_bOK (Normal completion) are on.
- By turning i_bEN (Execution command) on, the EtherNet/IP communication start request (Un\G37.0) turns on.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 279 Parameter setting.

Timing chart of I/O signals

■For normal completion

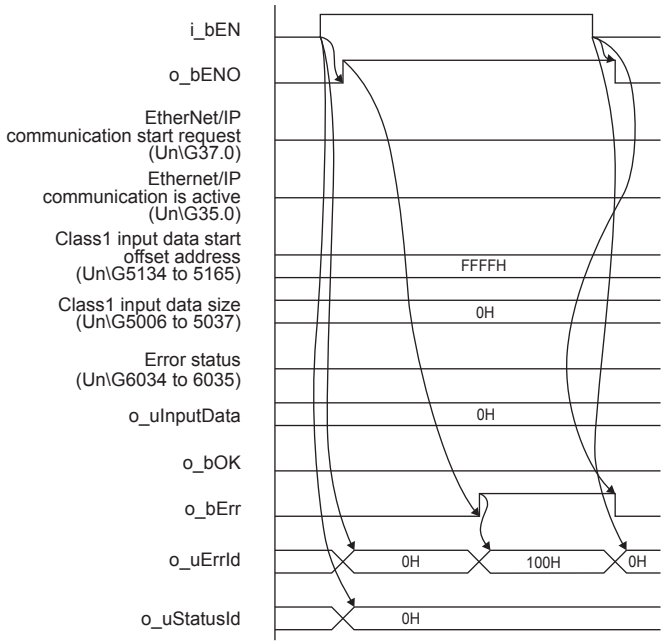
When the operation is recovered after an error occurs for a certain time during communication



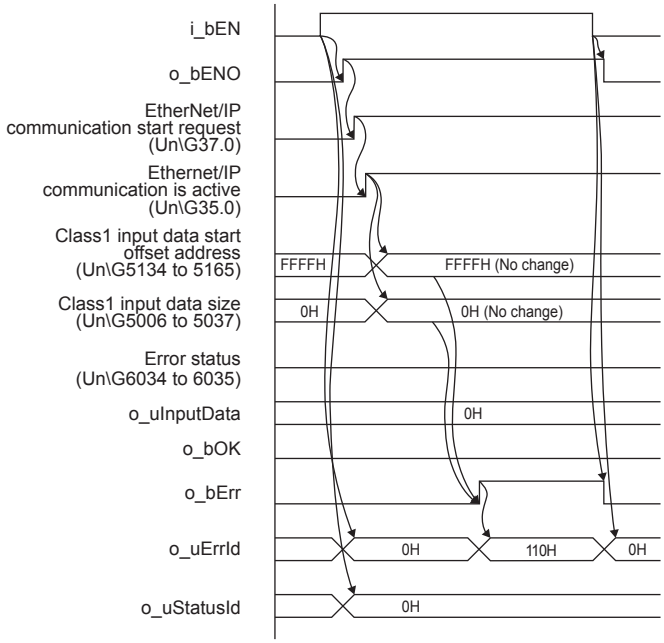
*1 Error code of connection communication error

■For error completion

Out of setting range for i_uConnectionNo (connection No.)



Input data is not allocated to the target connection



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning i_bEN (Execution command) off, o_bOK (Normal completion) and o_bErr (Error completion) turn off, and o_uErrId (Error code) and o_uStatusId (Error code of connection communication error) are cleared into 0.
- Even if i_bEN (Execution command) is turned off, the EtherNet/IP communication start request (Un\G37.0) does not turn off. To stop the EtherNet/IP communication, turn off i_bEN (Execution command) which is the FB of all FX5-ENET/IP in a program and then turn off the EtherNet/IP communication start request (Un\G37.0).
- When i_uConnectionNo (Connection No.) is changed during i_bEN (Execution command) is turned on, if i_uConnection is changed to the value out of effective range, the change is not reflected on the FB operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- Every input must be provided with a value for proper FB operation.

Parameter setting

Set the target device connection configuration on Ethernet by using GX Works3.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-ENET/IP] ⇨ [Basic Settings] ⇨ [External Device Configuration]

In the target device connection configuration setting, set the TCP connection or UDP connection. Set the EtherNet/IP communication by using EtherNet/IP Configuration Tool for FX5-ENET/IP. For the parameter setting, refer to the MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual.

For details on EtherNet/IP Configuration Tool for FX5-ENET/IP, refer to the MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	—	105.0ms	0.992ms	203 scans
FX5U, FX5UC*1*2	—	56.4ms	0.748ms	131 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

Error code

Error code (hexadecimal)	Description	Action
100H	The setting value of i_uConnectionNo (connection No.) is invalid.	After reviewing the setting, re-execute the FB.
110H	The input data is not allocated to the target connection.	Try again after checking the setting of EtherNet/IP Configuration Tool for FX5-ENET/IP.
200H	A connection communication error occurs on the target connection.	Confirms an error code stored in o_uStatusId (Error code of connection communication error). Refer to the MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual.

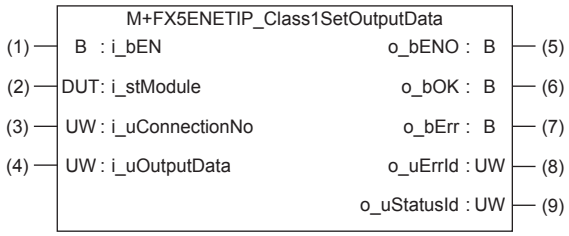
Version upgrade history

Version	Date	Description
00A	October 2019	First edition
01A	October 2020	Initialization processing in the FB is revised.

6.2 M+FX5ENETIP_Class1SetOutputData (Class1 communications output data setting)

Overview

This FB updates the output data of the specified connection by Class1 communication.



Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	On, off	On: The FB is activated. Off: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-ENET/IP.
(3)	i_uConnectionNo	Connection No.	Word [Unsigned]/Bit String [16-bit]	1 to 32	Specify the number of the connection where the output data is acquired.
(4)	i_uOutputData	Output data storage device	Word [Unsigned]/Bit String [16-bit]	—	Specify the head number of the device where the output data is stored.

Output label

No.	Variable name	Name	Data type	Default value	Description
(5)	o_bENO	Execution status	Bit	Off	Outputs the execution state of the FB. • On: Executed • Off: Not executed
(6)	o_bOK	Normal completion	Bit	Off	When this label is on, it indicates that communication is established.
(7)	o_bErr	Error completion	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
(8)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that occurred in the FB.
(9)	o_uStatusId	Error code of connection communication error	Word [Unsigned]/Bit String [16-bit]	0	When a connection communication error occurs (200 (hexadecimal) is stored in o_uErrId (Error code)), an error code is stored in o_uStatusId (Error code of connection communication error).

FB details

Available device

■Module for EtherNet/IP

Target module	Firmware version	Engineering tool
FX5-ENET/IP	—	GX Works3 with version 1.050C or later

■CPU module

FX5UJ/FX5U/FX5UC CPU module

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	471 steps The number of steps of the FB embedded in the program varies depending on the CPU module used, the input/output definitions, and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Label usage	• Label: 0.02K points (Word) • Latch label: 0K points (Word) The amount of labels used in the program varies depending on the CPU module used, the device specified in an argument and the option setting of GX Works3. For the option setting of GX Works3, refer to the 📖GX Works3 Operating Manual.
Number of index register usage	• Index register: 0 points • Long index register: 0 points
File register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

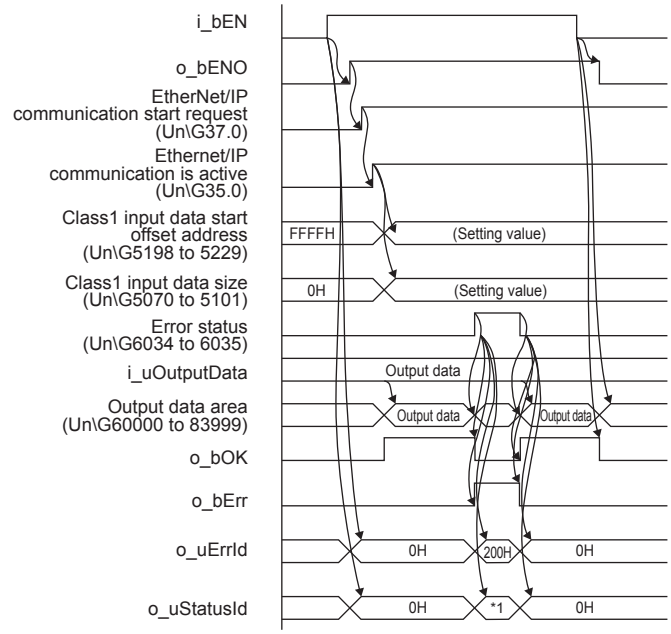
Processing

- By turning i_bEN (Execution command) on, the output data of the specified connection is set through Class1 communications.
- The designated number is continuously stored in the output area for the specified connection number from i_uOutputData (Output data storage device) while i_bEN (Execution command) and o_bOK (Normal completion) are on. For the number of devices transferred from i_uOutputData (Output data storage device), refer to the 📖MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual.
- By turning i_bEN (Execution command) on, the EtherNet/IP communication start request (Un\G37.0) turns on.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 279 Parameter setting.

Timing chart of I/O signals

■For normal completion

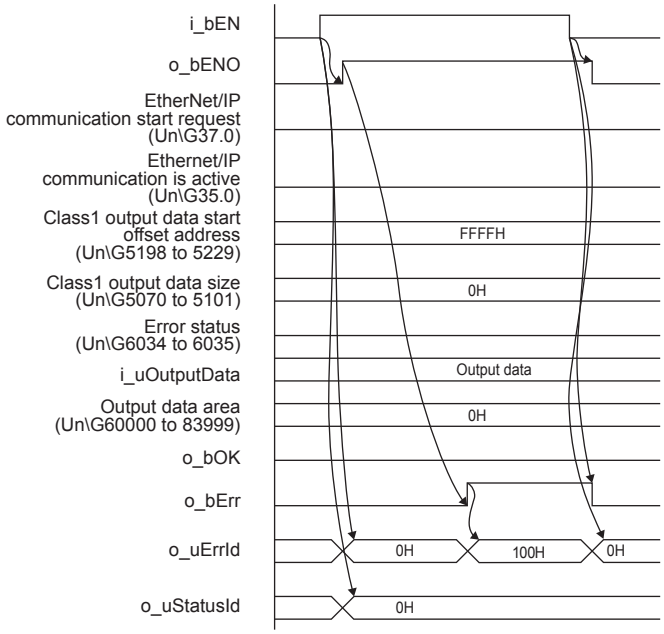
When the operation is recovered after an error occurs for a certain time during communication



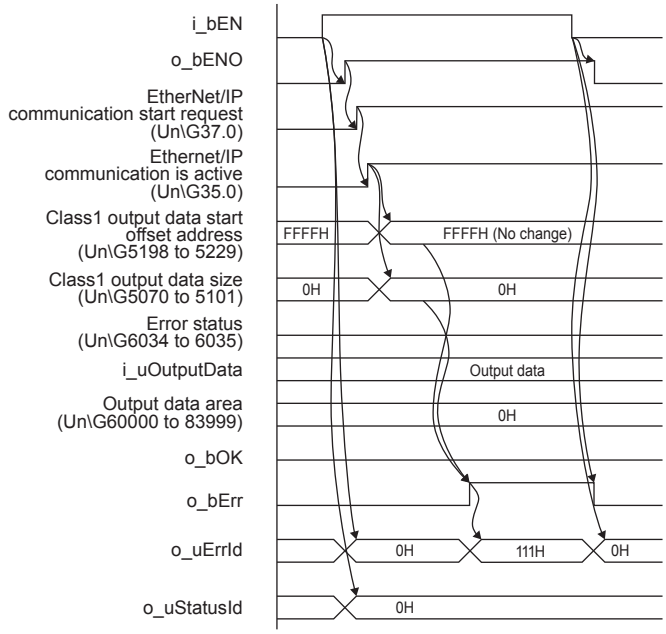
*1 Error code of connection communication error

■For error completion

Out of setting range for i_uConnectionNo (connection No.)



Output data is not allocated to the target connection



Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- Turn off i_bEN (Execution command) after o_bOK (Normal completion) or o_bErr (Error completion) is turned on. By turning i_bEN (Execution command) off, o_bOK (Normal completion) and o_bErr (Error completion) turn off, and o_uErrId (Error code) and o_uStatusId (Error code of connection communication error) are cleared into 0.
- Even if i_bEN (Execution command) is turned off, the EtherNet/IP communication start request (Un\G37.0) does not turn off. To stop the EtherNet/IP communication, turn off i_bEN (Execution command) which is the FB of all FX5-ENET/IP in a program and then turn off the EtherNet/IP communication start request (Un\G37.0).
- When i_uConnectionNo (Connection No.) is changed during i_bEN (Execution command) is turned on, if i_uConnection is changed to the value out of effective range, the change is not reflected on the FB operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 279 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	—	105.0ms	0.950ms	202 scans
FX5U, FX5UC*1*2	—	55.8ms	0.739ms	131 scans

*1 When the program capacity is set to 128K steps, the processing speed may be reduced.
*2 The labels in the standard area are used.

Error code

Error code (hexadecimal)	Description	Action
100H	The setting value of i_uConnectionNo (connection No.) is invalid.	After reviewing the setting, re-execute the FB.
111H	The output data is not allocated to the target connection.	Try again after checking the setting of EtherNet/IP Configuration Tool for FX5-ENET/IP.
200H	A connection communication error occurs on the target connection.	Confirms an error code stored in o_uStatusId (Error code of connection communication error). Refer to the MELSEC iQ-F FX5-ENET/IP Ethernet Module User's Manual.

Version upgrade history

Version	Date	Description
00A	October 2019	First edition
01A	October 2020	Initialization processing in the FB is revised.

7 EXAMPLE OF USE

7.1 M+FX5UCPU-EN_SLMP_DeviceRead_IP (Reading of SLMP-compatible device)

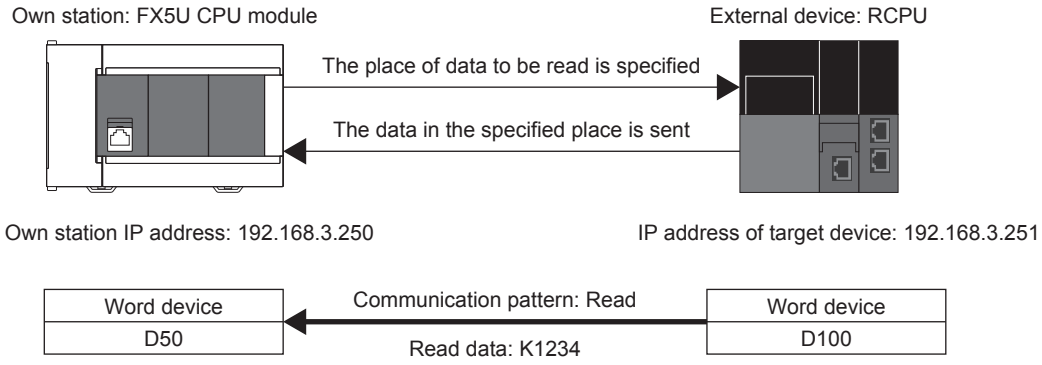
Use M+FX5UCPU-EN_DeviceRead_IP (Reading of SLMP-compatible device) to read the device data specified by the target device.

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D100 of the target device is read into device D50 of the own device.



Preliminary setting

Set K1234 in device D100 of the target device.

Parameter setting

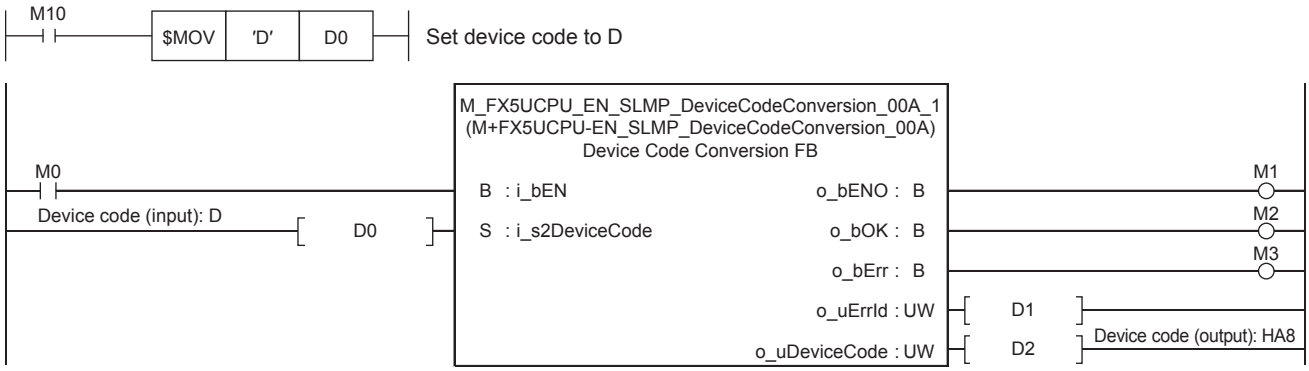
The own station IP address and SLMP communication settings are set using GX Works3. For details on the setting methods, refer to the 📖MELSEC iQ-F FX5 User's Manual (Communication).

Program

The device read out from the target device is converted into a binary code. After the conversion, the data from the device specified by the target device is read out with M+FX5UCPU-EN_DeviceRead_IP (Reading of SLMP-compatible device).

• Convert the device code to the binary code.

In M+FX5UCPU-EN_SLMP_DeviceRead_IP (Reading of SLMP-compatible device), the device to be read is specified with a binary code. Therefore, the device to read is converted into a binary code with M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB). In this example, the data is read from D100 of the target device, so the device code "D" is converted into a binary code. For details on FB, refer to ☞ Page 65 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB).



• Setting the IP address of the target device

Set the IP address of the target device to 192.168.3.251. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



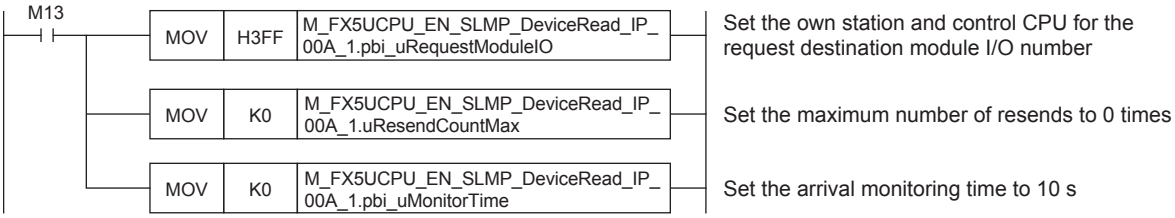
• Setting the head device number

Set the head device number of the device to read in D12.



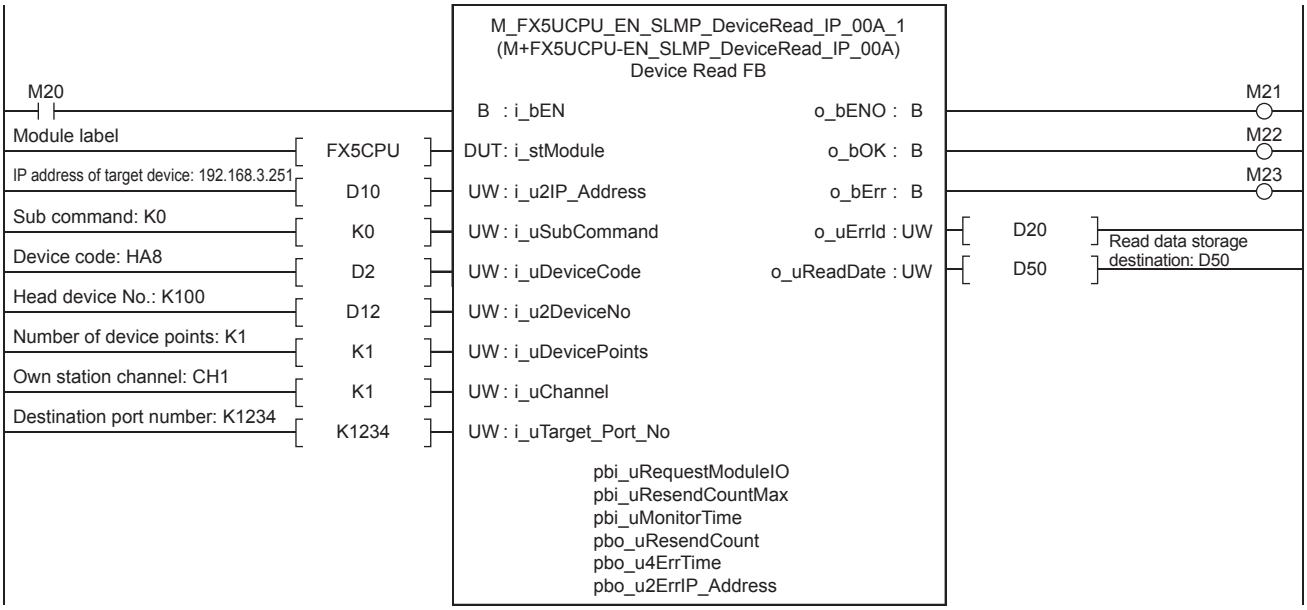
• Setting the operation parameter

Set the operation parameter used for M+FX5UCPU-EN_SLMP_DeviceRead_IP (Reading of SLMP-compatible device) FB.



• Setting and executing reading of SLMP-compatible device

The value from target device D100 is read using M+FX5UCPU-EN_SLMP_DeviceRead_IP (Reading of SLMP-compatible device) FB. The read value is stored in device D50 of the own station.



7.2 M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device)

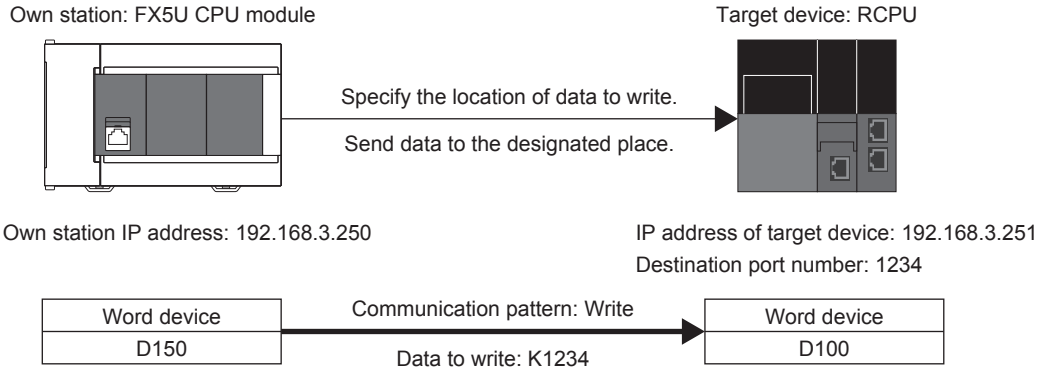
The data is written to the device specified by the target device using M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device).

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D150 of the own device is written to device D100 of the target device.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

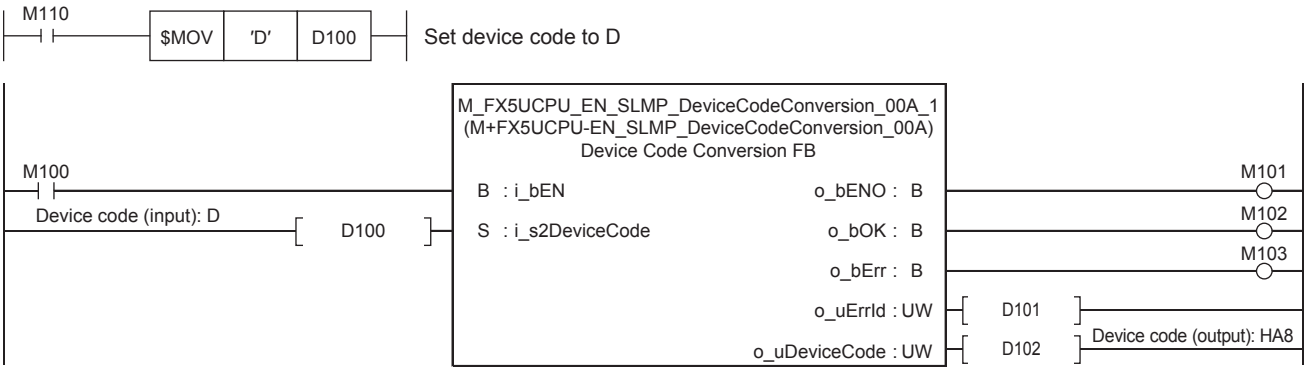
The own station IP address and SLMP communication settings are set using GX Works3. For details on the setting methods, refer to the 📖MELSEC iQ-F FX5 User's Manual (Communication).

Program

The device written to the target device is converted into a binary code. After the conversion, the data from the device specified by the target device is written with M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device).

• Convert the device code to the binary code.

With M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device), the device to write is specified with a binary code. Therefore, the device to write is converted into binary code with M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB). In this example, the data is written into D100 of the target device, so the device code "D" is converted into binary code. For details on FB, refer to ☞ Page 65 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB).



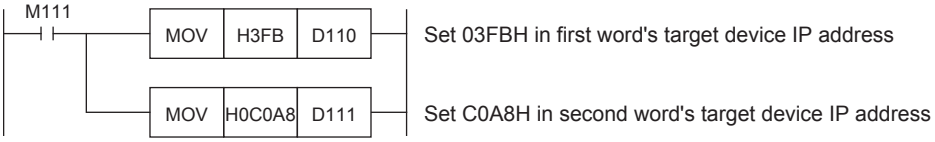
• Setting the IP address of the target device

Set the IP address of the target device to 192.168.3.251. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



• Setting the head device number

Set the head device number of the device to be written to D112.



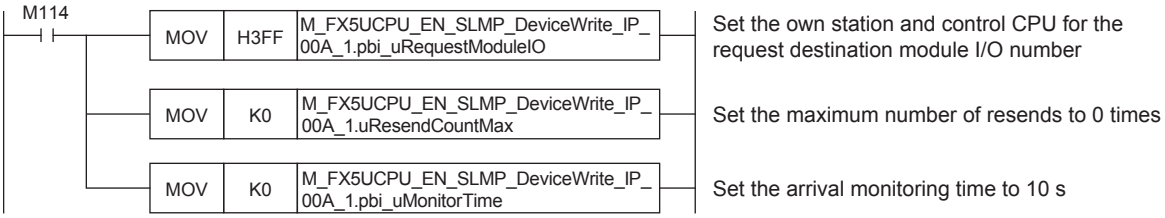
• Setting the write data storage destination

Set the data K1234 to be written to D150.



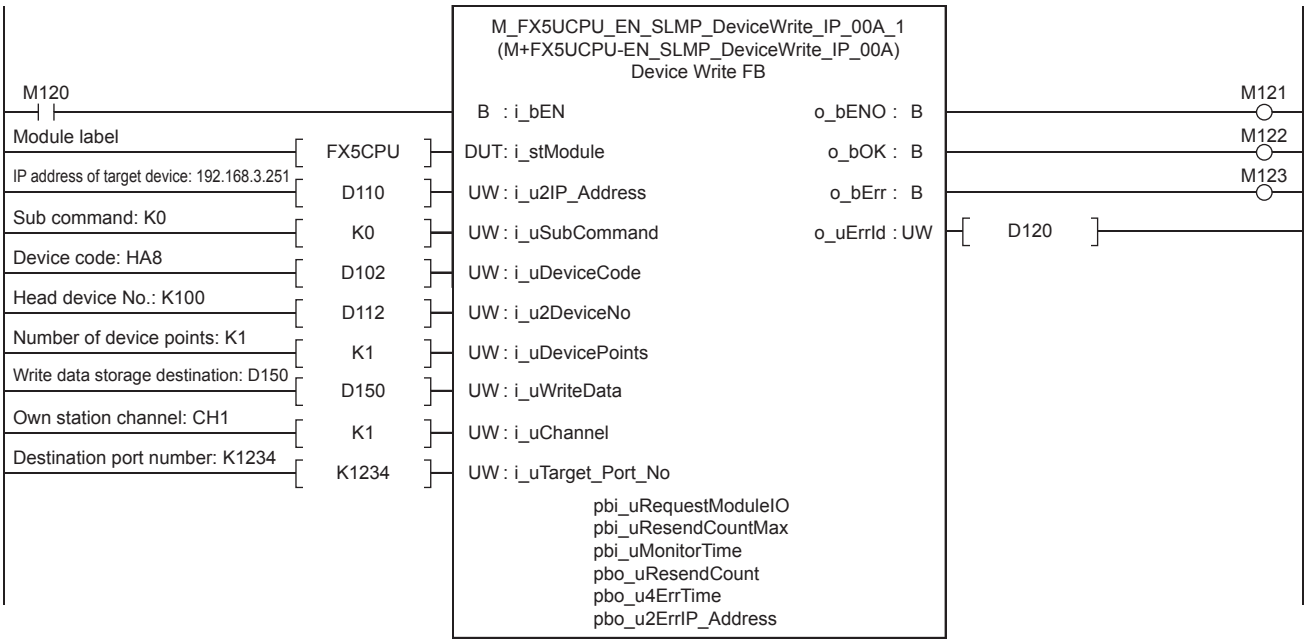
• Setting the operation parameter

Set the operation parameter to use in M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device) FB.



• Setting and executing writing to SLMP-compatible device

The value stored in the own device D150 is written into the set target device D100 using M+FX5UCPU-EN_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device) FB.



7.3 M+FX5UCPU-EN_SLMP_DeviceRead_Active (Reading of SLMP-compatible device with Active connection)

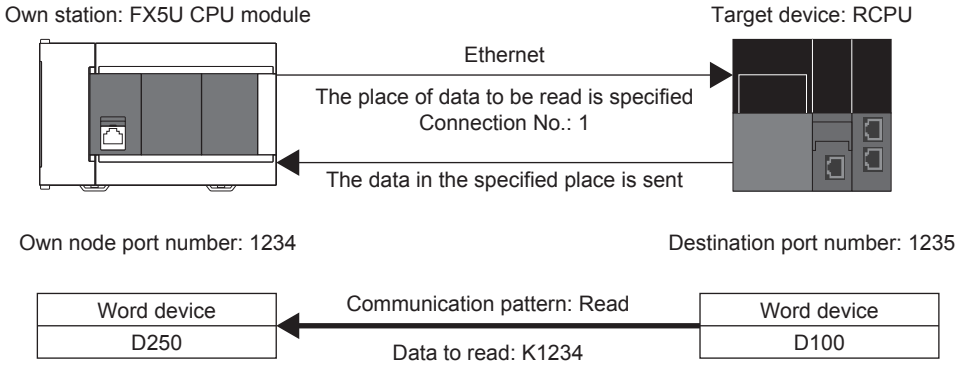
The data in the device specified by the target device is read using M+FX5UCPU-EN_DeviceRead_Active (Reading of SLMP-compatible device with Active connection).

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in the target device D100 is read to the own device D250 with an Active connection.



Preliminary setting

Set K1234 in device D100 of the target device.

Parameter setting

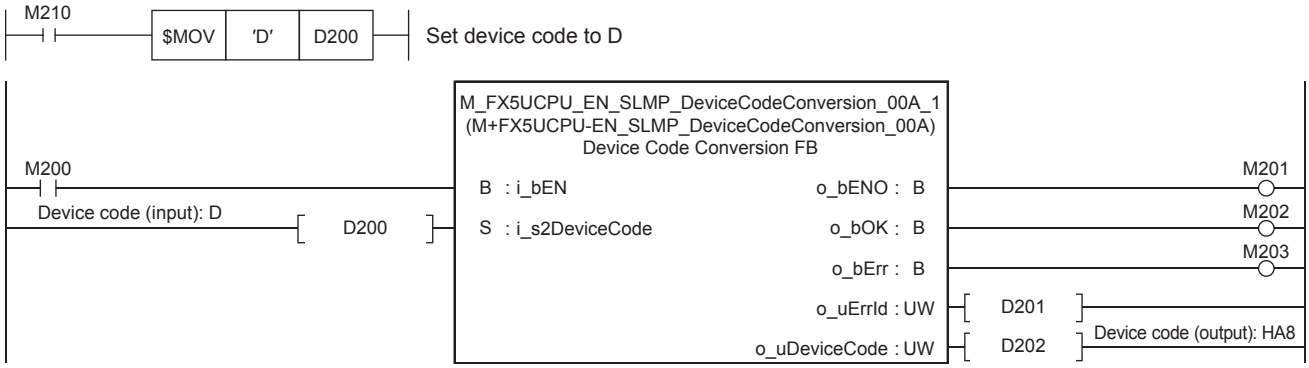
No parameter setting is required to use this FB.

Program

The device to be read in the target device is converted into a binary code. After the conversion, the data from the device specified by the target device is read with M+FX5UCPU-EN_DeviceRead_Active (Reading of SLMP-compatible device with Active connection).

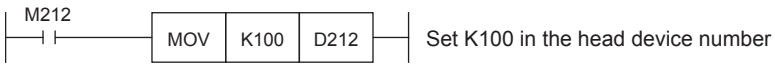
• Convert the device code to the binary code.

With M+FX5UCPU-EN_DeviceRead_Active (Reading of SLMP-compatible device with Active connection), the device to be read is specified with a binary code. Therefore, the device to read is converted into a binary code with M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB). In this usage example, D100 of the target device is read so the device code "D" is converted into a binary code. For details on FB, refer to ☞ Page 65 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB).



• Setting the head device number

Set the head device number of the device to read in D212.

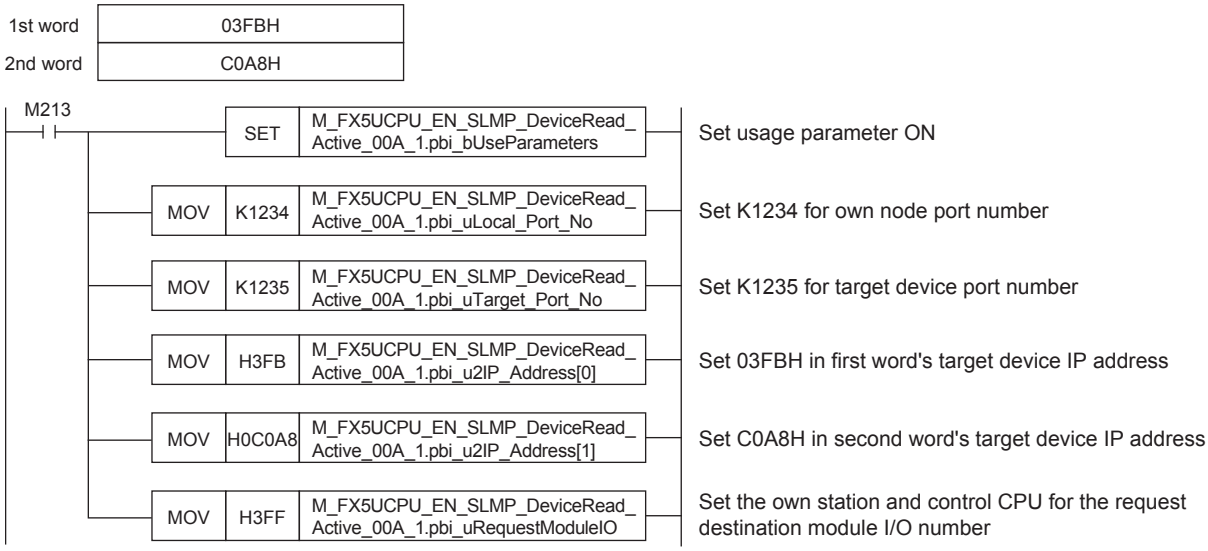


• Setting the operation parameter

In this usage example, the connection is opened with the operation parameter settings. Therefore, pbi_bUseParameters (Usage parameters) is turned on. When the parameter is OFF, the opening process settings are configured with GX Works3. For details, refer to the MELSEC iQ-F FX5 User's Manual (Communication). Set pbi_u2IP_Address (Target device IP address) to 192.168.3.251. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

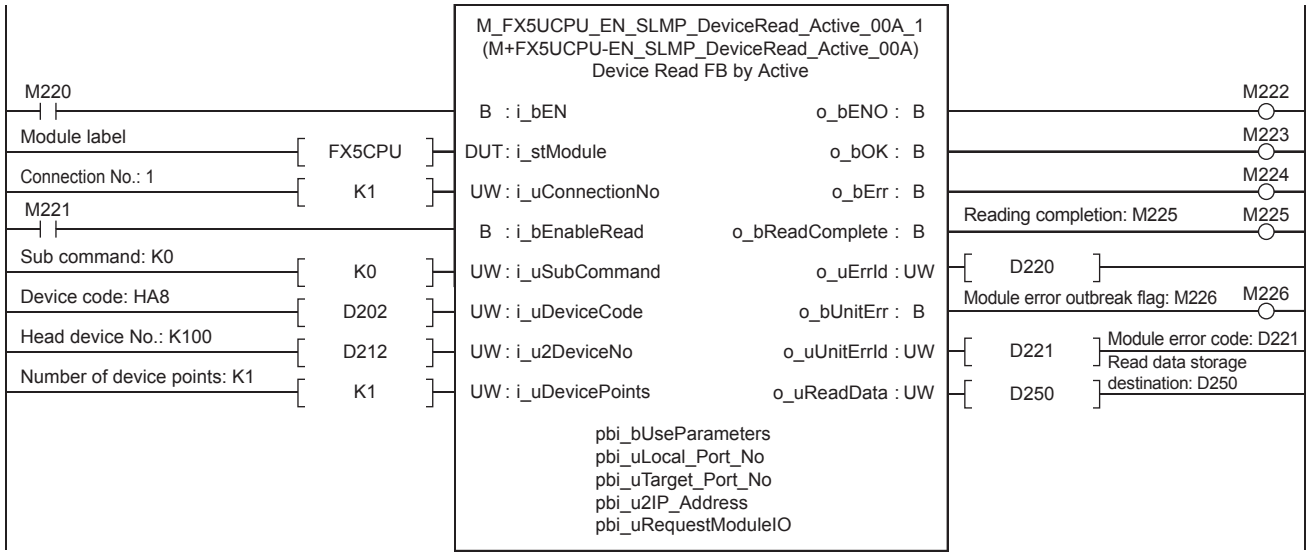
Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

Set as shown below for this usage example.



• Setting and executing reading of SLMP-compatible device with Active connection

The Active open process is executed when i_bEN (Execution command) is turned on by the M+FX5UCPU-EN_DeviceRead_Active (Reading of SLMP-compatible device with Active connection) FB. o_bOK (Normal completion) turns on when the Active open process is completed. After o_bOK (Normal completion) turns on, the value is read from D100 of the set target device when i_bEnableRead (Reading execution) turns on. The read value is stored in D250 of the own device.



7.4 M+FX5UCPU-EN_SLMP_DeviceWrite_Active (Writing to SLMP target device with Active connection)

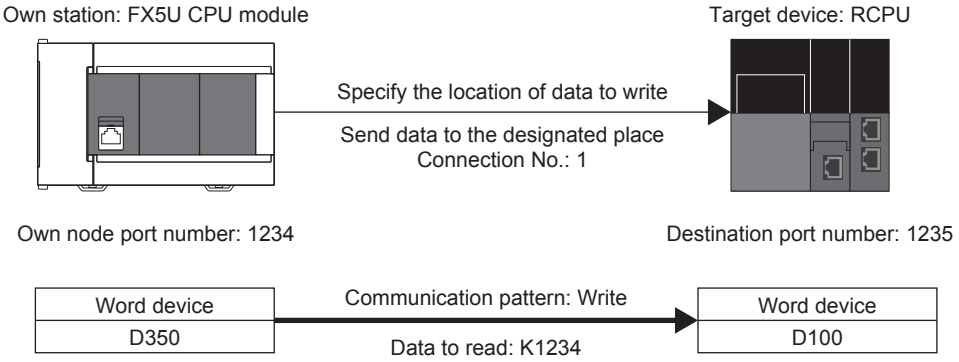
The data is written to the device specified with the target device using M+FX5UCPU-EN_DeviceWrite_Active (Writing to SLMP target device with Active connection).

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in D350 of the own device is written to device D100 of the target device with an Active connection.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

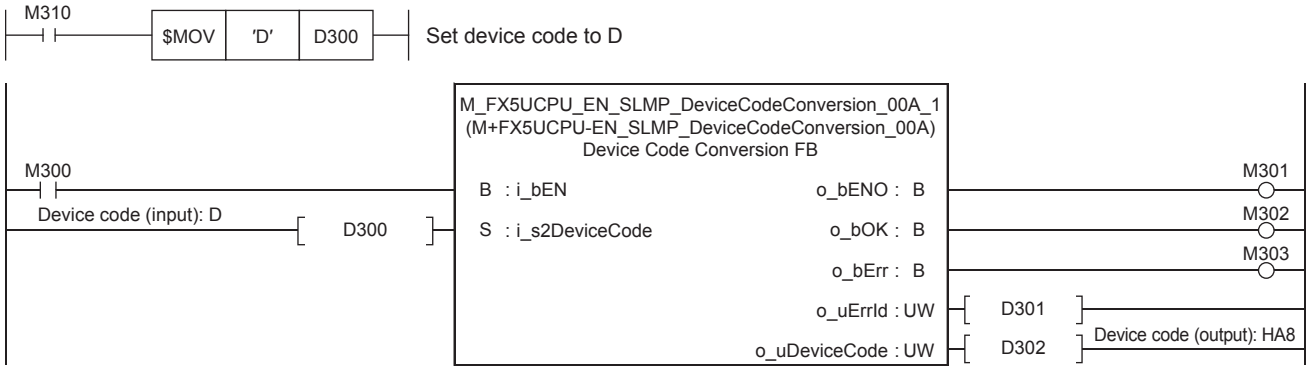
No parameter setting is required to use this FB.

Program

The device written to the target device is converted into a binary code. After the conversion, the data from the device specified by the target device is written with M+FX5UCPU-EN_DeviceWrite_Active (Writing to SLMP target device with Active connection).

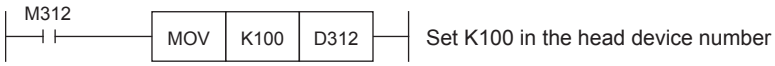
• Convert the device code to the binary code.

With M+FX5UCPU-EN_DeviceWrite_Active (Writing to SLMP target device with Active connection), the device to be written is specified with a binary code. Therefore, the device to write is converted into binary code with M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB). In this example, the data is written into D100 of the target device, so the device code "D" is converted into binary code. For details on FB, refer to ☞ Page 65 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB).



• Setting the head device number

Set the head device number of the device to be written to D312.



• Setting the write data storage destination

Set the data K1234 to be written to D350.



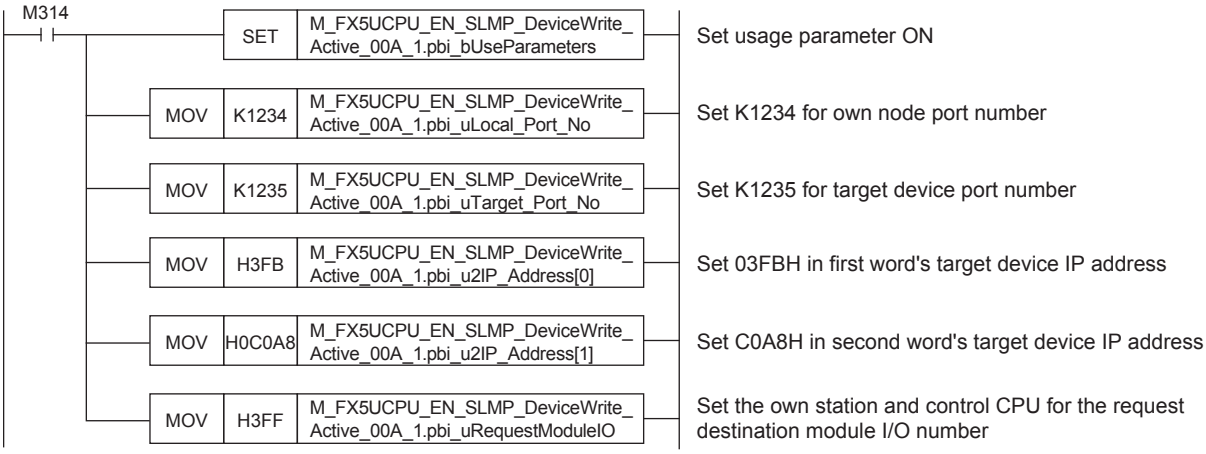
• Setting the operation parameter

In this usage example, the connection is opened with the operation parameter settings. Therefore, pbi_bUseParameters (Usage parameters) is turned on. When the parameter is OFF, the opening process settings are configured with GX Works3. For details, refer to the 📖MELSEC iQ-F FX5 User's Manual (Communication). Set pbi_u2IP_Address (Target device IP address) to 192.168.3.251. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

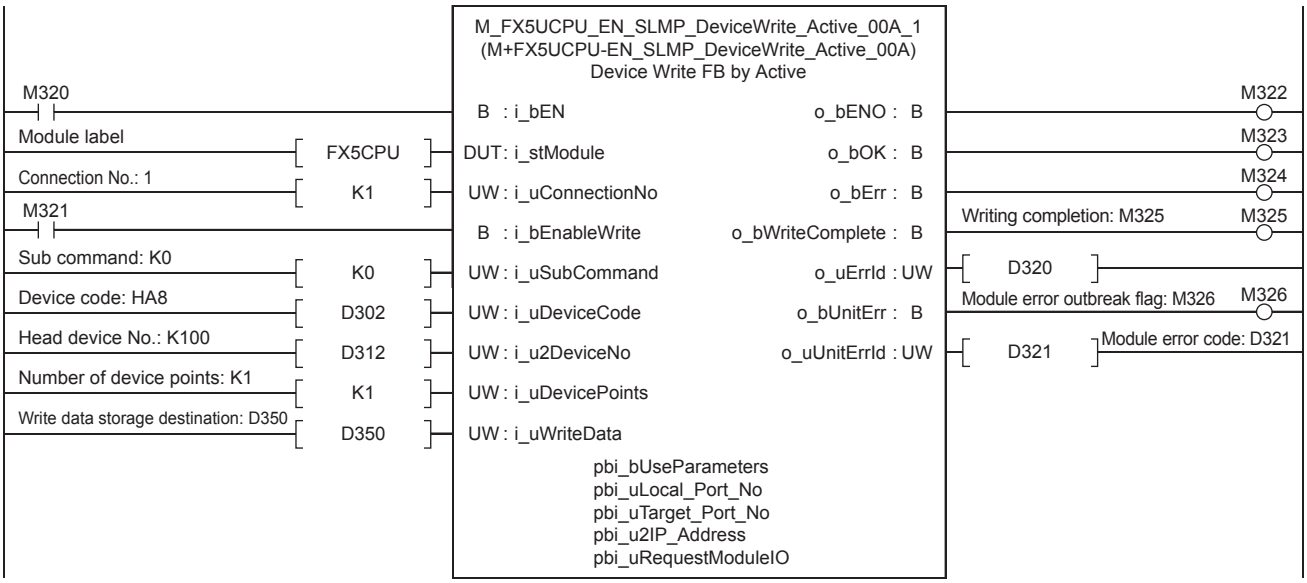
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



• Setting and executing writing of SLMP-compatible device with Active connection

The Active open process is executed when i_bEN (Execution command) is turned on by the M+FX5UCPU-EN_DeviceWrite_Active (Writing to SLMP-compatible device with Active connection) FB. o_bOK (Normal completion) turns on when the Active open process is completed. After o_bOK (Normal completion) turns on, the value stored in D350 of the own device is written to D100 of the set target device when i_bEnableWrite (Writing execution) is turned on.



7.5 M+FX5CCLIEF_DeviceRead (Reading of another station device)

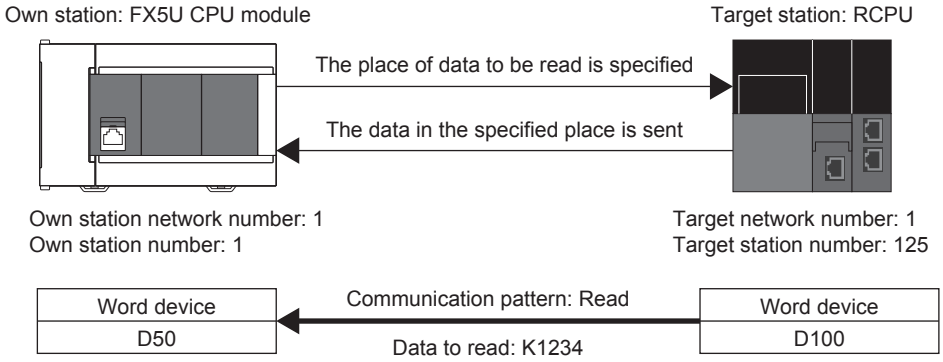
The data of the specified device in the target station is read using M+FX5CCLIEF_DeviceRead (Reading of another station device).

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D100 of the target station is read to device D50 in the own station.



Preliminary setting

Set K1234 in device D100 of the target device.

Parameter setting

Set the own station network number and station number.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. For details on the setting methods, refer to the 📖MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

• Station number setting

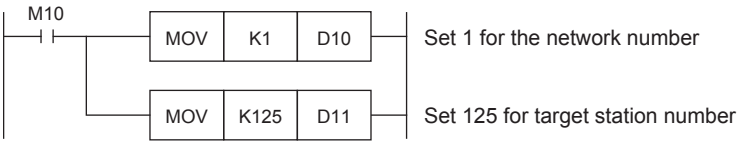
The own station number is set with GX Works3 or with M+FX5CCLIEF_StationNoSet (Own station number setting). For details on setting with GX Works3, refer to the 📖MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual. Refer to ☞ Page 214 M+FX5CCLIEF_StationNoSet (Own station number setting) for details on setting with M+FX5CCLIEF_StationNoSet (Own station number setting).

Program

The data is read from the network number and station number of the target station with M+FX5CCLIEF_DeviceRead (Reading of another station device).

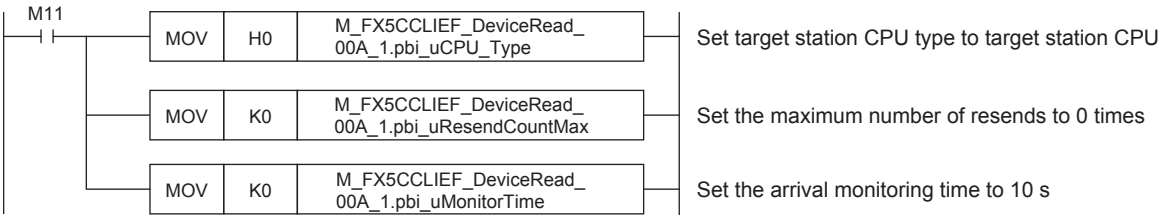
• Setting the network number and station number

Set the network number and station number of the target station for reading the value.



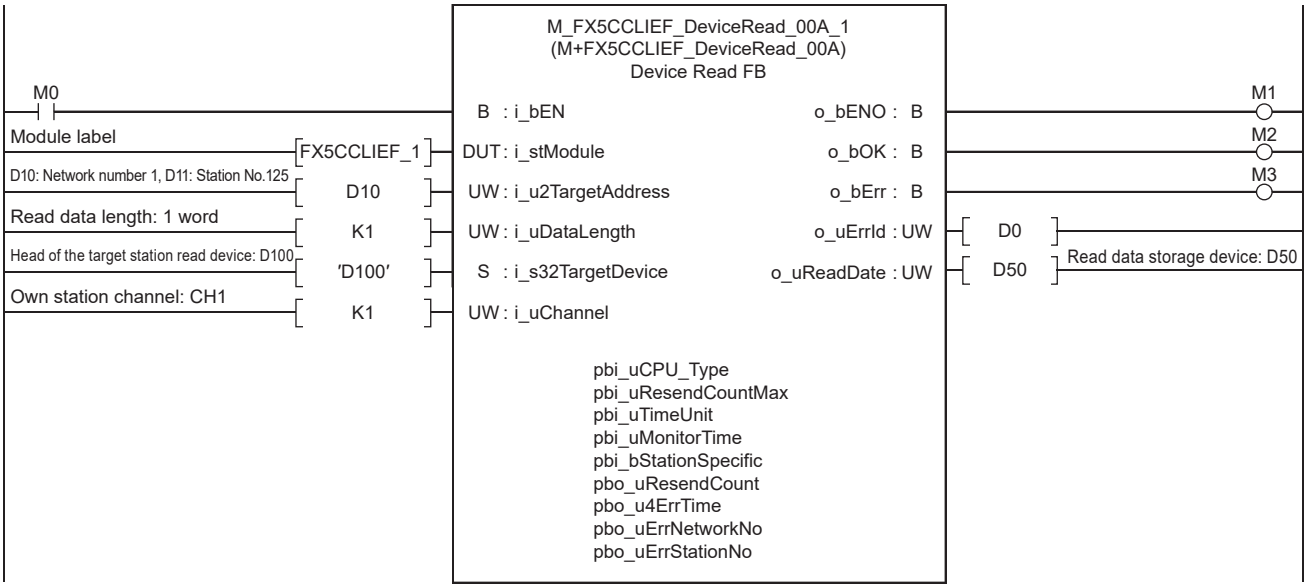
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLIEF_DeviceRead (Reading of another station device) FB.



• Setting and executing reading of another station device

The value is read from device D100 of the set target station using M+FX5CCLIEF_DeviceRead (Reading of another station device) FB. The read value is stored in the own station's device D50.



7.6 M+FX5CCLIEF_DeviceWrite (Writing to another station device)

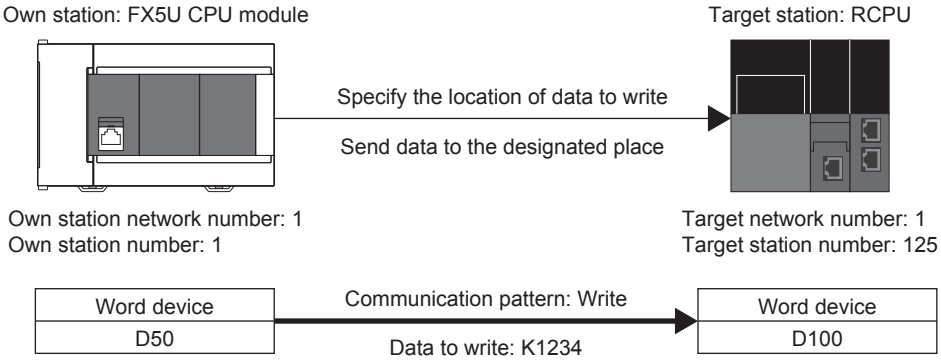
Data is written to the specified device of the target station using M+FX5CCLIEF_DeviceWrite (Writing to another station device).

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D50 of the own station is written to D100 of the target station.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

Set the own station network number and station number.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. For details on the setting methods, refer to the 📖MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual.

• Station number setting

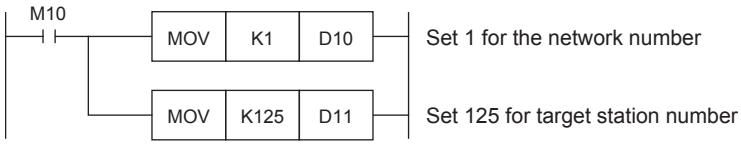
The own station number is set with GX Works3 or with M+FX5CCLIEF_StationNoSet (Own station number setting). For details on setting with GX Works3, refer to the 📖MELSEC iQ-F FX5 CC-Link IE Field Network Module User's Manual. Refer to ☞ Page 214 M+FX5CCLIEF_StationNoSet (Own station number setting) for details on setting with M+FX5CCLIEF_StationNoSet (Own station number setting).

Program

Data is written from the target station's network number and station number using M+FX5CCLIEF_DeviceWrite (Writing to another station device).

• Setting the network number and station number

Set the network number and station number of the target station in which the value is to be written.



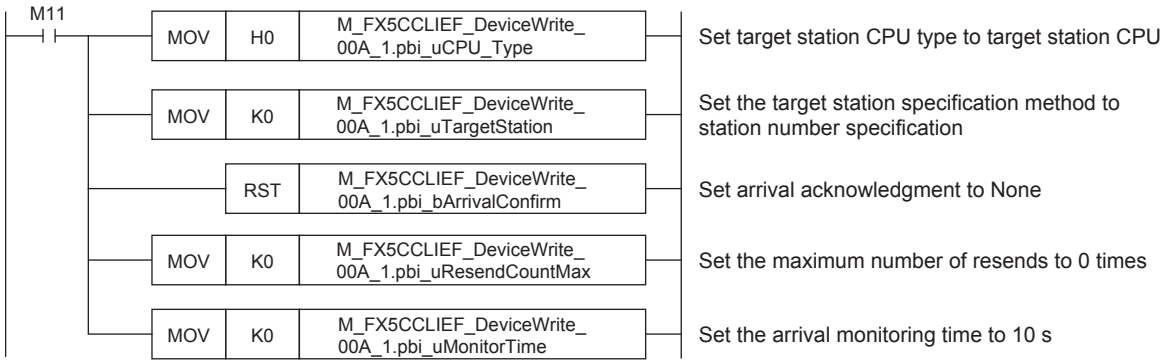
• Setting the write data storage device

Set the data K1234 to be written to D50.



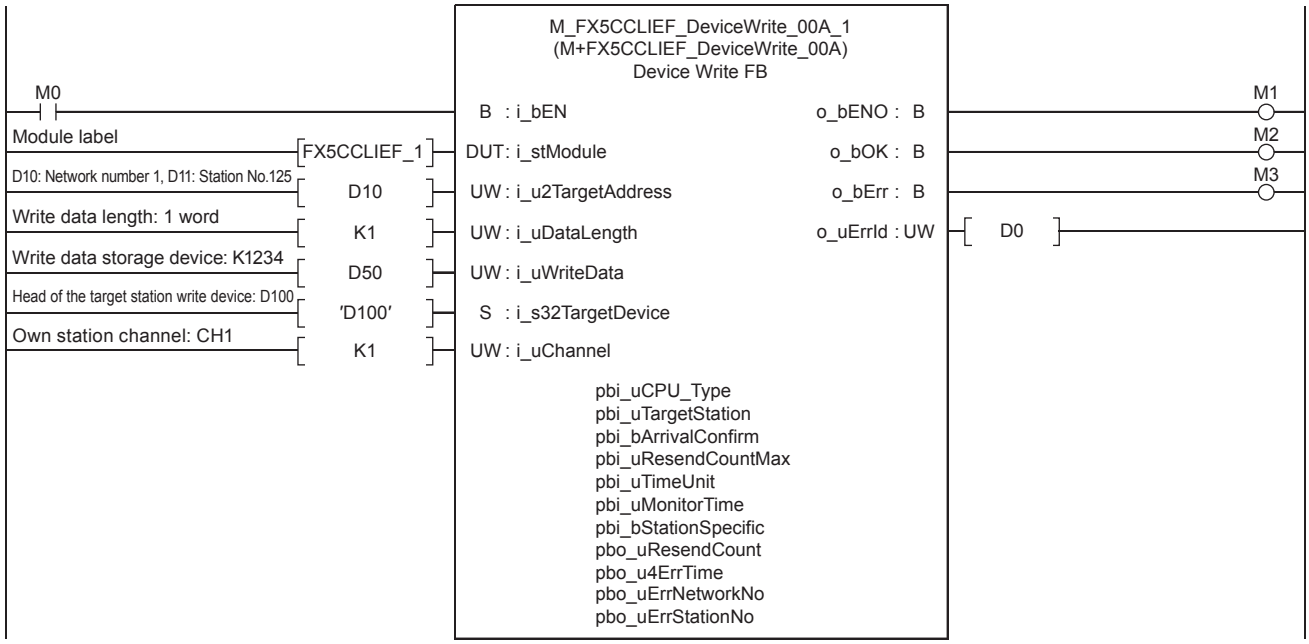
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLIEF_DeviceWrite (Writing to another station device) FB.



• Setting and executing writing to another station device

The value stored in the own station device D50 is written to device D100 of the set target station using the M+FX5CCLIEF_DeviceWrite (Writing to another station device) FB.



7.7 M+FX5CCLGNMS_DeviceRead (Reading of another station device)

The data of the specified device in the target station is read using M+FX5CCLGNMS_DeviceRead (Reading of another station device). There are two methods of reading. The methods for when the target station address specification method is off and when the target station address specification method is on are given here.

When the target station address specification method is off

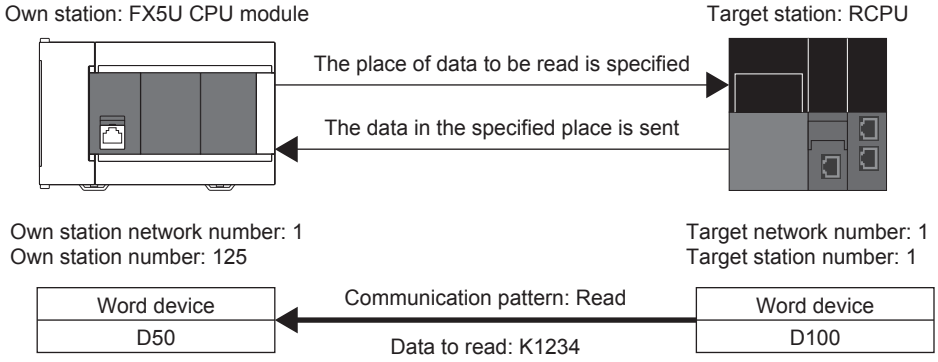
System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D100 of the target station is read to device D50 in the own station.

The target station is specified with the network number and station number.



Preliminary setting

Set K1234 in device D100 of the target device.

Parameter setting

Set the own station network number and station number.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

• Station number setting

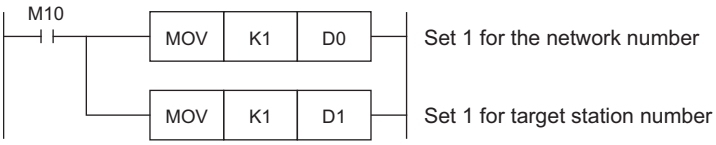
The own station number is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on setting with GX Works3. Refer to ☞ Page 165 M+FX5CCLGNMS_SetAddress (Station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

Program

The data is read from the network number and station number of the target station with M+FX5CCLGNMS_DeviceRead (Reading of another station device).

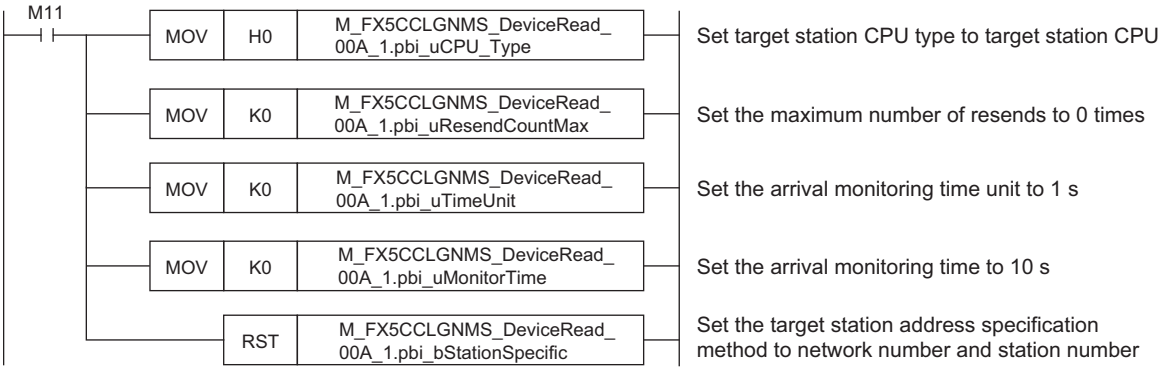
• Setting the network number and target station number

Set the network number and station number of the target station for reading the value.



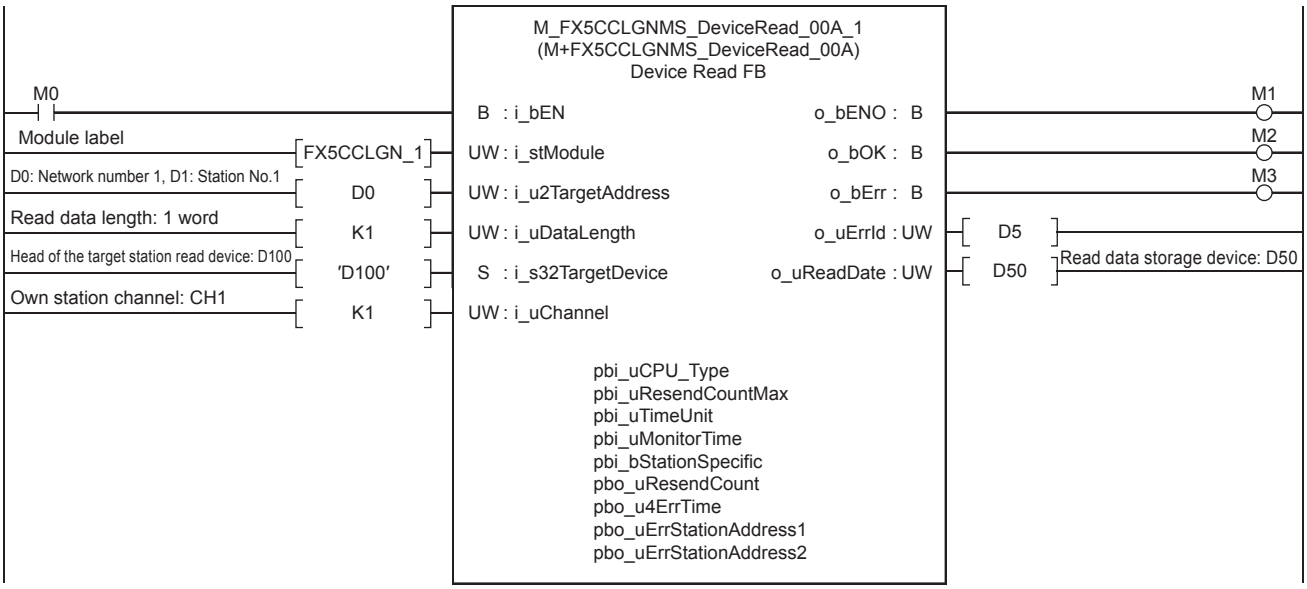
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_DeviceRead (Reading of another station device) FB.



• Setting and executing reading of another station device

The value is read from device D100 of the set target station using M+FX5CCLGNMS_DeviceRead (Reading of another station device) FB. The read value is stored in the own station's device D50.



When the target station address specification method is on

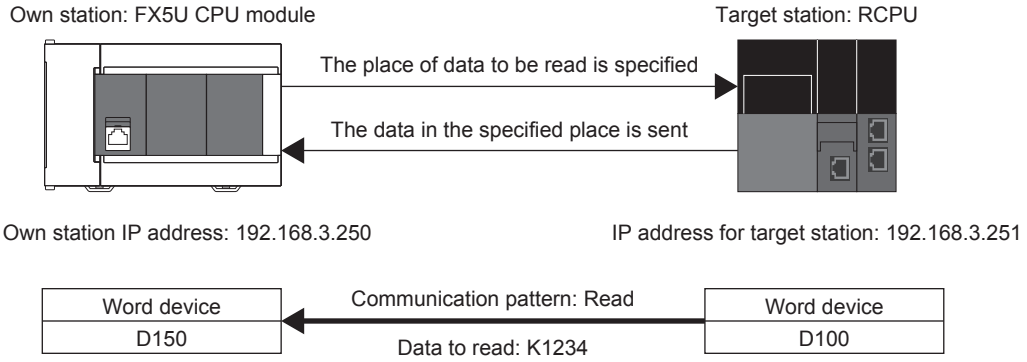
System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D100 of the target station is read to device D150 in the own station.

The target station is specified with the IP address.



Preliminary setting

Set K1234 in device D100 of the target device.

Parameter setting

The own station network number and IP address are set.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

• Setting the IP address

Set the own station IP address to 192.168.3.250. The own station IP address is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on setting with GX Works3.

Refer to ☞ Page 165 M+FX5CCLGNMS_SetAddress (Station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

Program

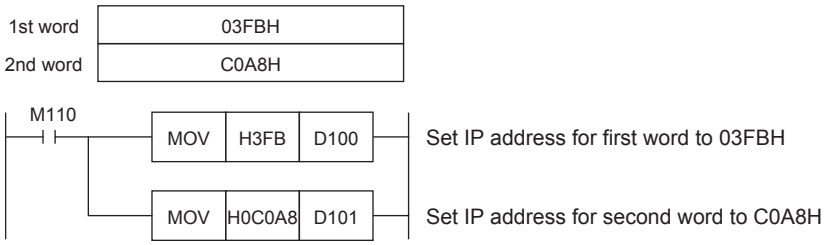
The data is read from the IP address of the target station using M+FX5CCLGNMS_DeviceRead (Reading of another station device).

• Setting the target station IP address

Set the target station's IP address to 192.168.3.251. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

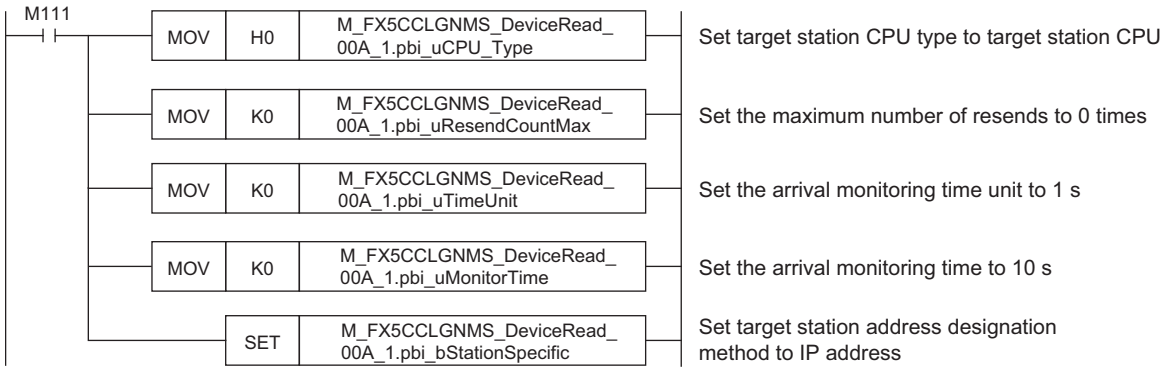
Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

Set as shown below for this usage example.



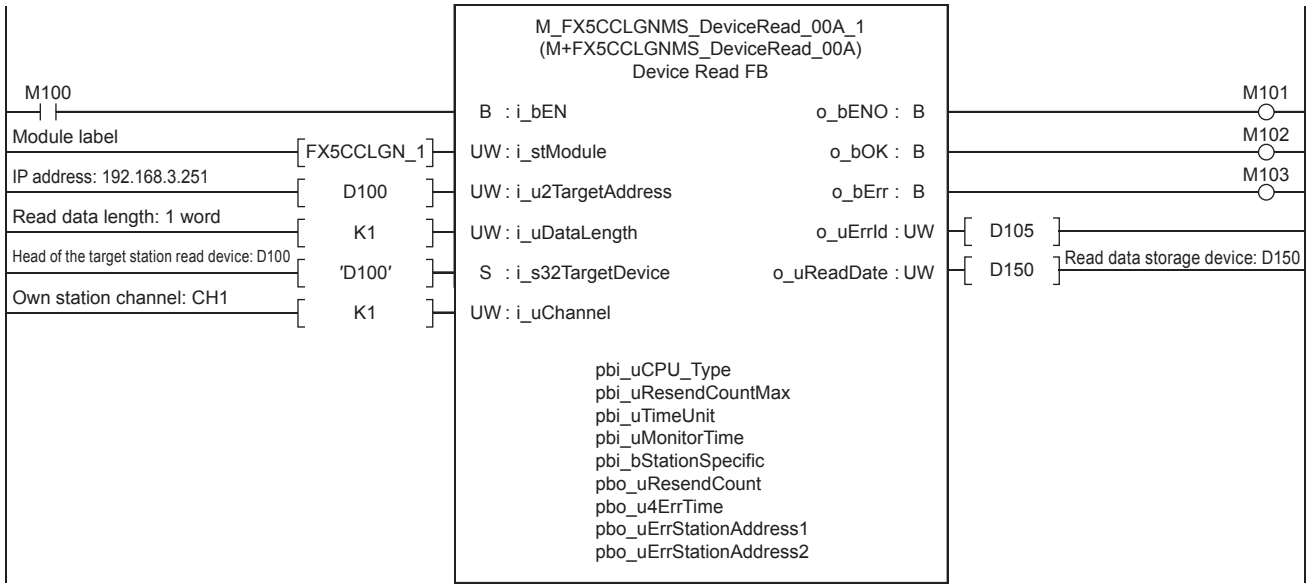
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_DeviceRead (Reading of another station device) FB.



• Setting and executing reading of another station device

The value is read from device D100 of the set target station using M+FX5CCLGNMS_DeviceRead (Reading of another station device) FB. The read value is stored in the own station's device D150.



7.8 M+FX5CCLGNMS_DeviceWrite (Writing to another station device)

Data is written to the specified device of the target station using M+FX5CCLGNMS_DeviceWrite (Writing to another station device). There are two methods of writing. The methods for when the target station address specification method is off and when the target station address specification method is on are given here.

When the target station address specification method is off

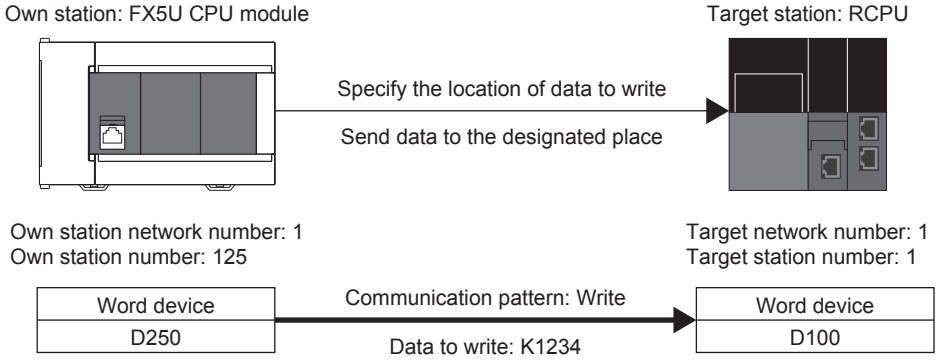
System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in the own station device D250 is written into device D100 of the target station.

The target station is specified with the network number and station number.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

Set the own station network number and station number.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

• Station number setting

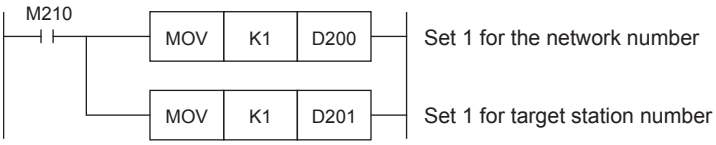
The own station number is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on setting with GX Works3. Refer to ☞ Page 165 M+FX5CCLGNMS_SetAddress (Station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

Program

Data is written to the target station's network number and station number with M+FX5CCLGNMS_DeviceWrite (Writing to another station device).

• Setting the network number and target station number

Set the network number and station number of the target station in which the value is to be written.



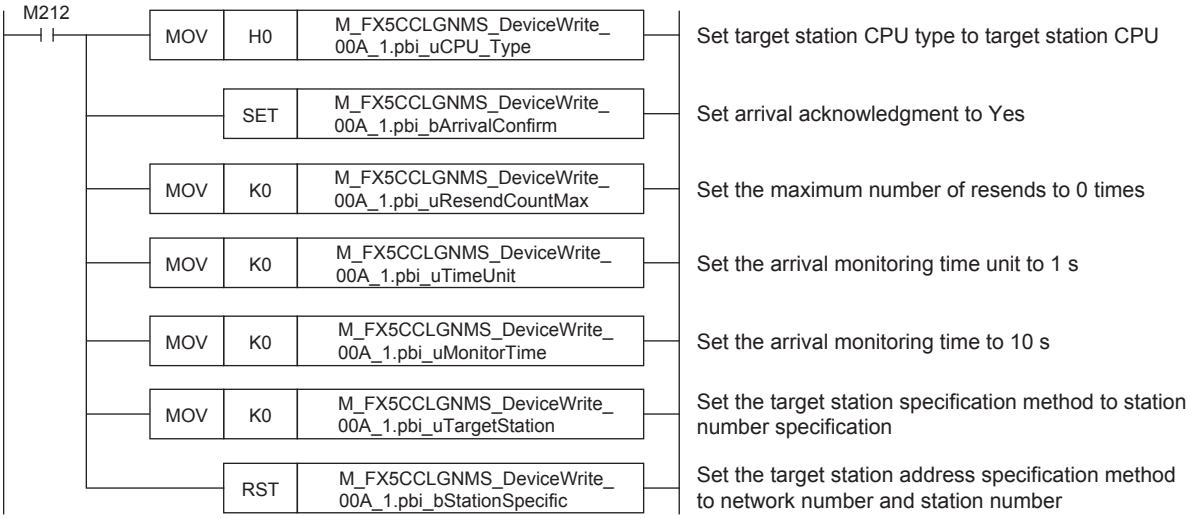
• Setting the write data storage device

Set the data K1234 to be written to D250.



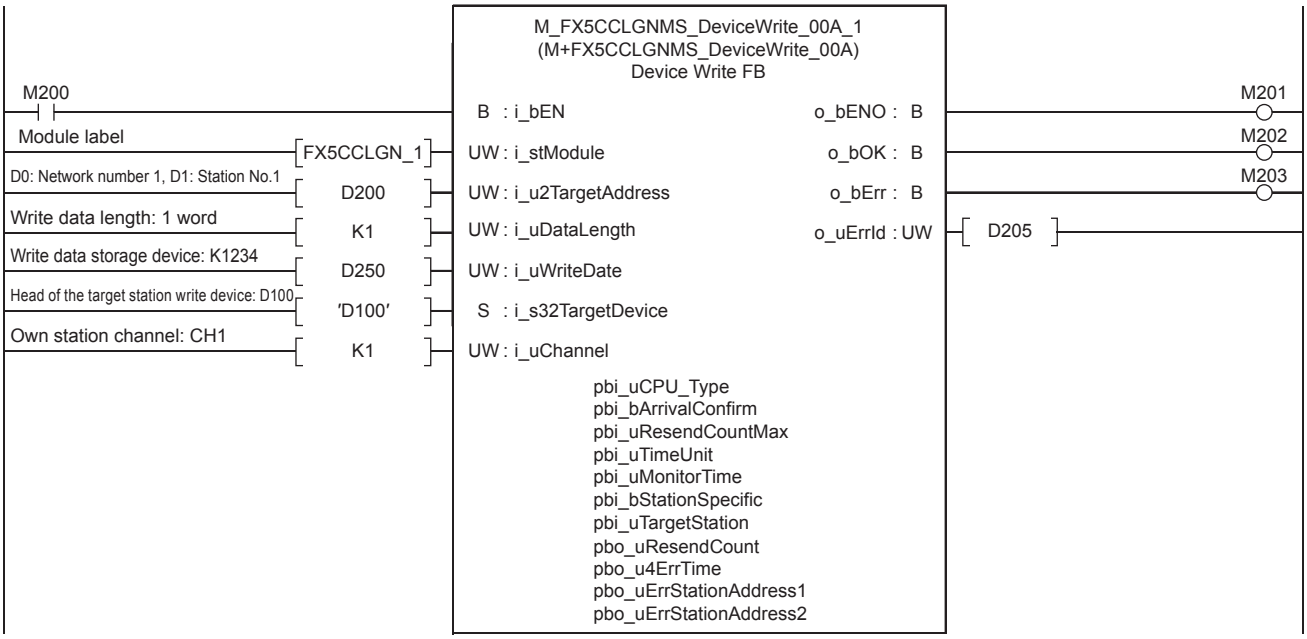
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_DeviceWrite (Writing to another station device) FB.



• Setting and executing writing to another station device

The value stored in the own station device D250 is written to device D100 of the set target station using the M+FX5CCLGNMS_DeviceWrite (Writing to another station device) FB.



When the target station address specification method is on

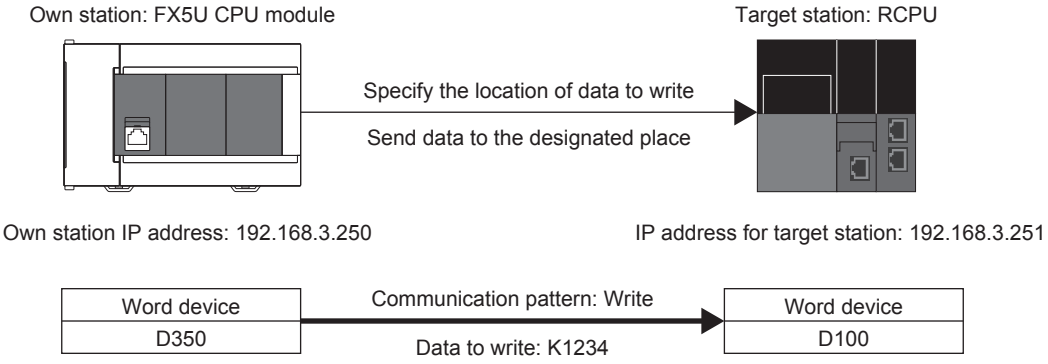
System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in the own station device D350 is written into device D100 of the target station.

The target station is specified with the IP address.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

The own station network number and IP address are set.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

• Setting the IP address

Set the own station IP address to 192.168.3.250. The own station IP address is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on setting with GX Works3.

Refer to ☞ Page 165 M+FX5CCLGNMS_SetAddress (Station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

Program

Data is written to the IP address of the target station with M+FX5CCLGNMS_DeviceWrite (Writing to another station device).

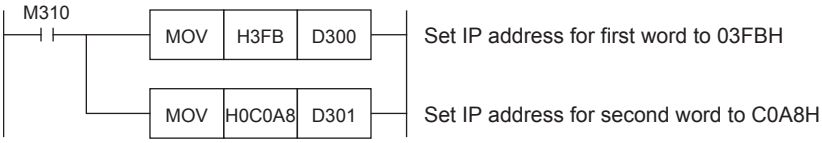
• Setting the target station IP address

Set the target station's IP address to 192.168.3.251. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

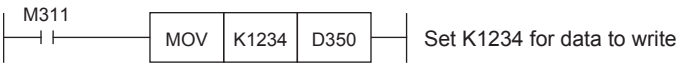
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



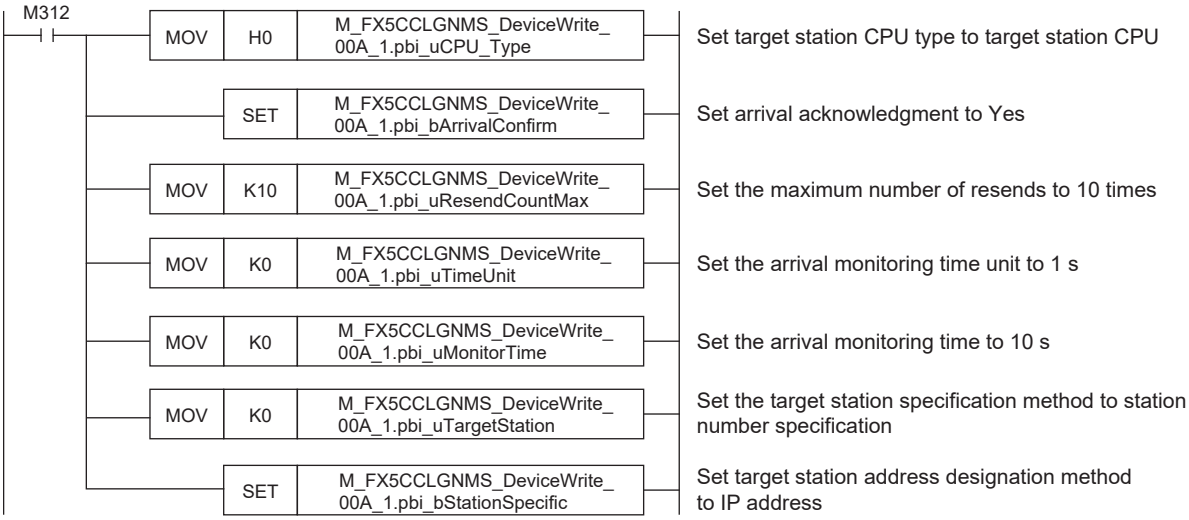
• Setting the write data storage device

Set the data K1234 to be written to D350.



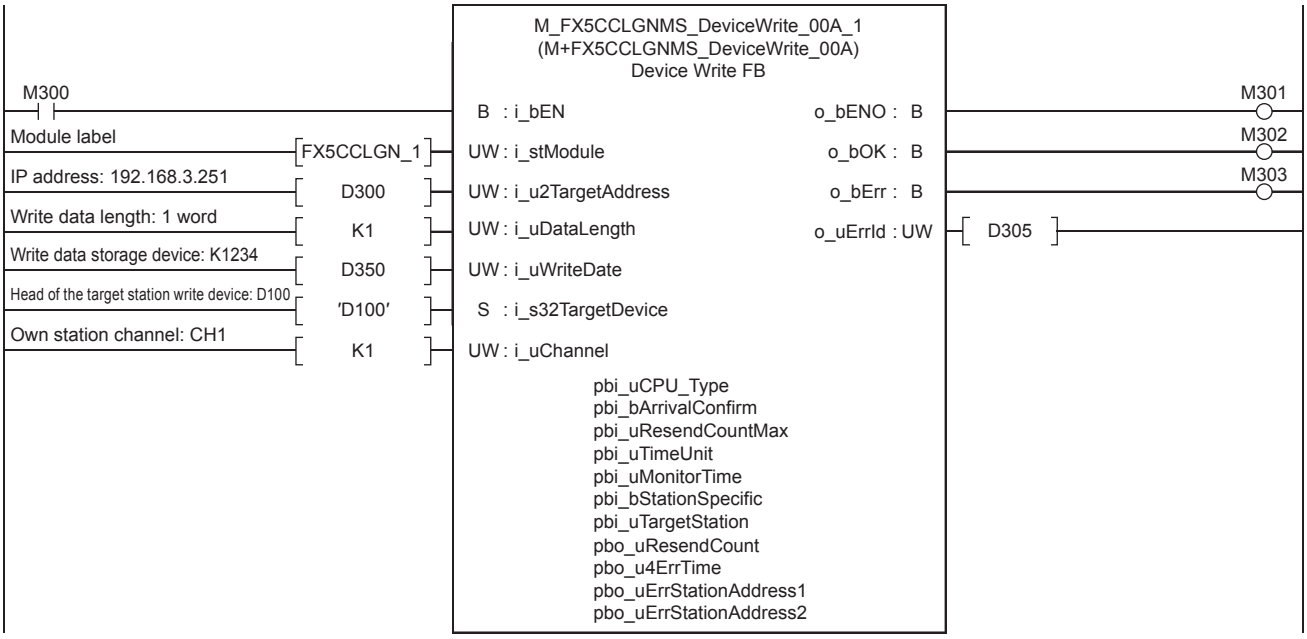
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_DeviceWrite (Writing to another station device) FB.



• Setting and executing writing to another station device

The value stored in the own station device D350 is written to device D100 of the set target station using the M+FX5CCLGNMS_DeviceWrite (Writing to another station device) FB.



7.9 M+FX5CCLGNMS_Send (Sending of another station data)

The data equal to the send data length is sent from the send data storage device to the target station using M+FX5CCLGNMS_Send (Sending of another station data). There are two methods of sending. The methods for when the target station address specification method is off and when the target station address specification method is on are given here.

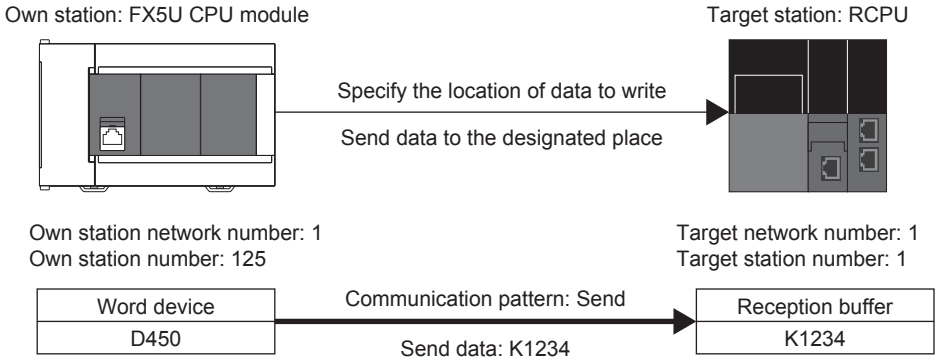
When the target station address specification method is off

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in the own station's device D450 is sent to the reception buffer of the target station.
The target station is specified with the network number and station number.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

Set the own station network number and station number.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

• Station number setting

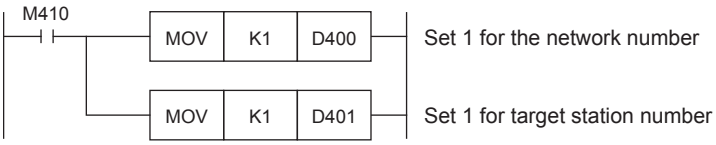
The own station number is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on setting with GX Works3.
Refer to ☞ Page 165 M+FX5CCLGNMS_SetAddress (Station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

Program

Data is sent to the target station's network number and station number with M+FX5CCLGNMS_Send (Sending of another station data).

• Setting the network number and target station number

Set the network number and station number of the target station that is receiving the sent data.



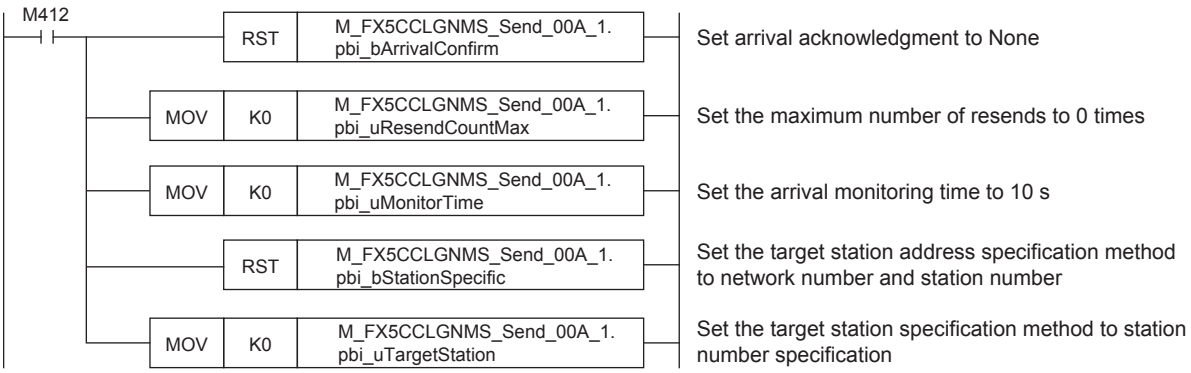
• Setting the send data storage device

In D450, set K1234 of the data to send to the target station.



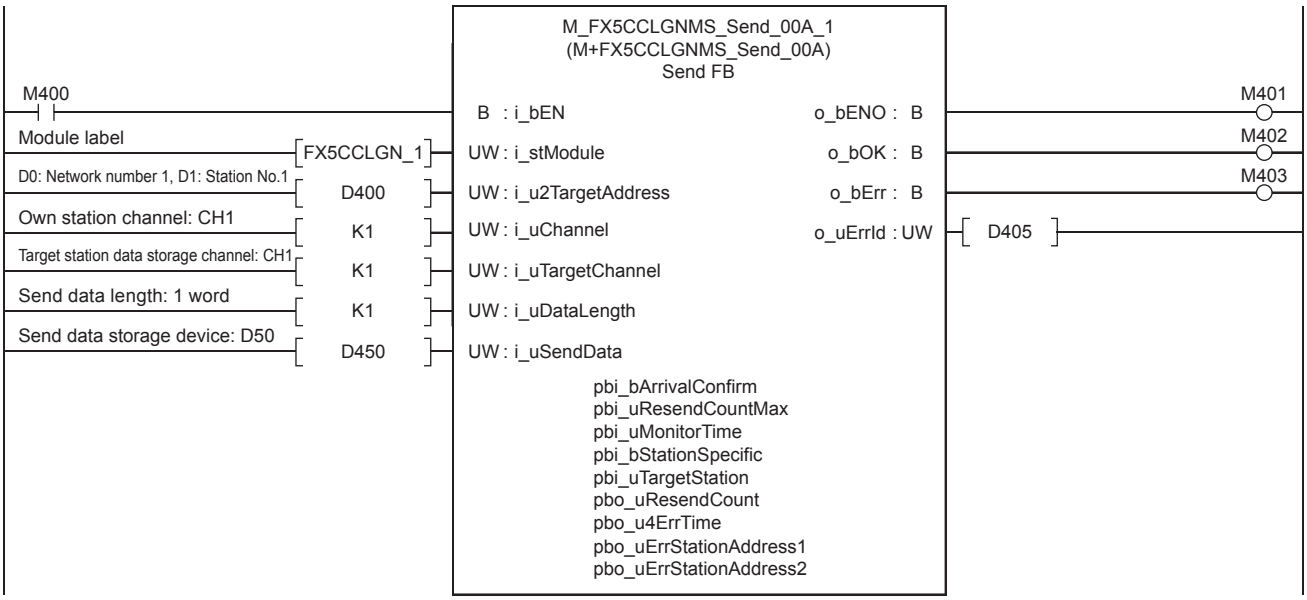
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_Send (Sending of another station data) FB.



• Setting and executing sending data to another station

The value stored in the own station device D450 is sent to the channel of the set target station using the M+FX5CCLGNMS_Send (Sending of another station data) FB.



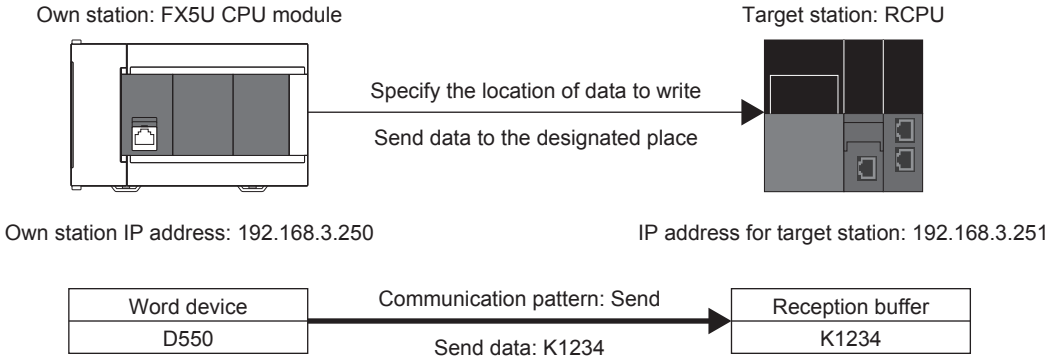
When the target station address specification method is on

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in the own station's device D550 is sent to the reception buffer of the target station.
The target station is specified with the IP address.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

The own station network number and IP address are set.

• Network number setting

Set the own station network number to 1. The network number is set with GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

• Setting the IP address

Set the own station IP address to 192.168.3.250. The own station IP address is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on setting with GX Works3.

Refer to ☞ Page 165 M+FX5CCLGNMS_SetAddress (Station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

Program

Data is sent to the IP address of the target station with M+FX5CCLGNMS_Send (Sending of another station data).

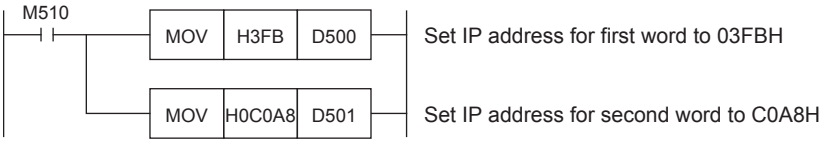
• Setting the target station IP address

Set the target station's IP address to 192.168.3.251. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

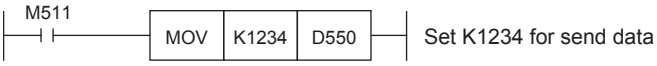
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



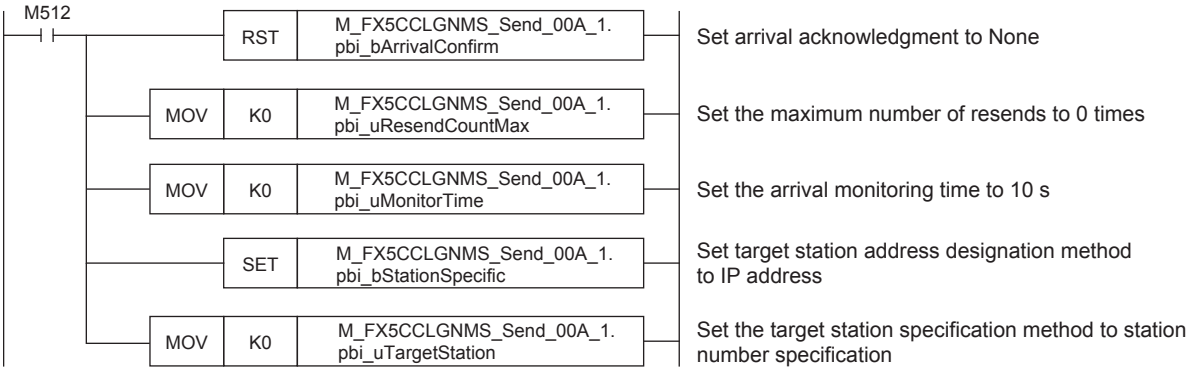
• Setting the send data storage device

In D550, set K1234 of the data to send to the target station.



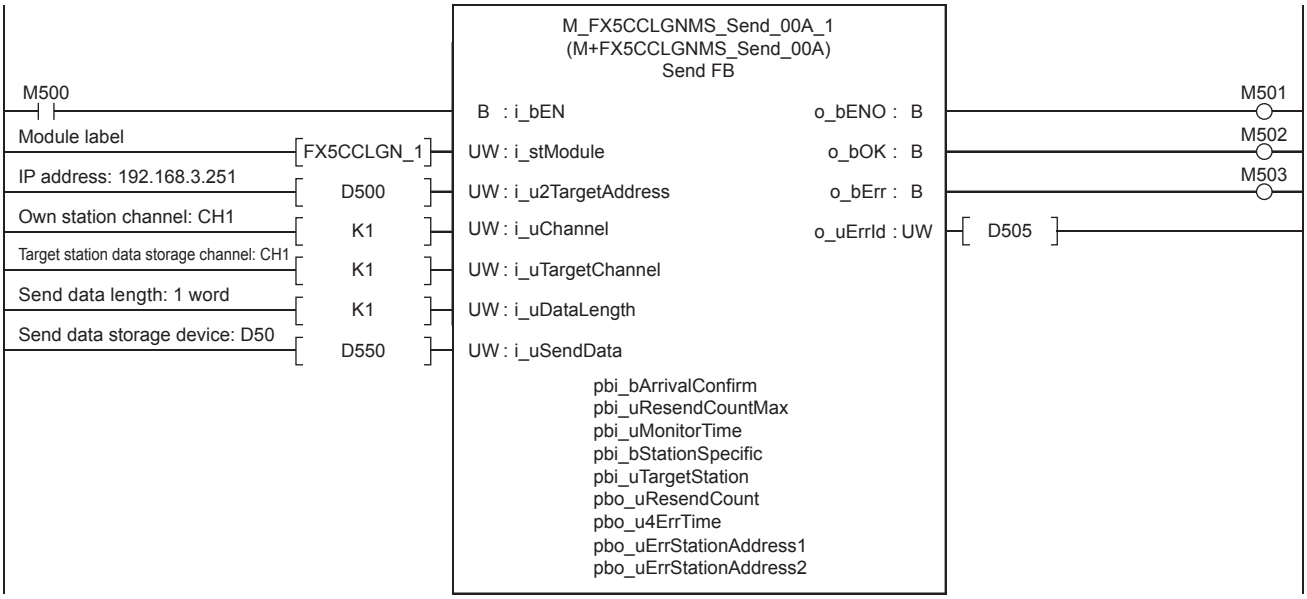
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_Send (Sending of another station data) FB.



• Setting and executing sending data to another station

The value stored in the own station device D550 is sent to the channel of the set target station using the M+FX5CCLGNMS_Send (Sending of another station data) FB.



7.10 M+FX5CCLGNMS_SetAddress (Station number/IP address setting)

Set the station number and IP address of the own station using M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The own station's station number and IP address are set with M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Set the following details.

- Station number: 0
- IP address: 192.168.3.250

Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

The module parameter "Parameter Setting Method" must be set to "Set with Program" with GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

Program

The own station's station number and IP address are set with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

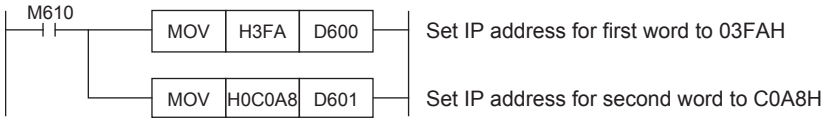
- Setting the IP address

Set the own station IP address to 192.168.3.250. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	250	FA

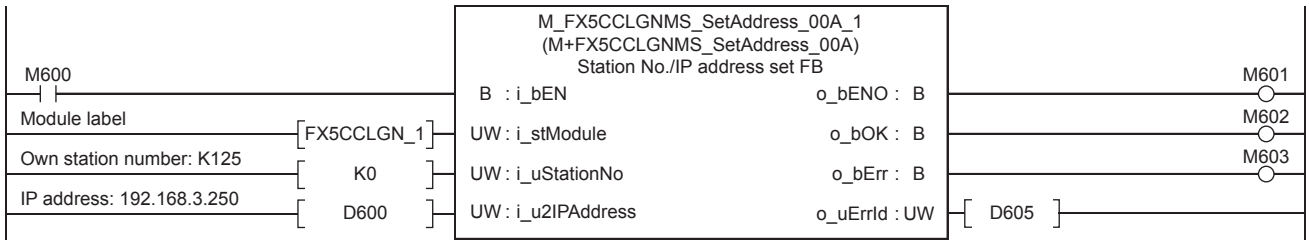
Set as shown below for this usage example.

1st word	03FAH
2nd word	C0A8H



- Setting and executing station number/IP address

The own station's station number/IP address are set with the M+FX5CCLGNMS_SetAddress (Station number/IP address setting) FB.



7.11 M+FX5CCLGNMS_SLMP_DeviceRead_IP (Reading of SLMP-compatible device)

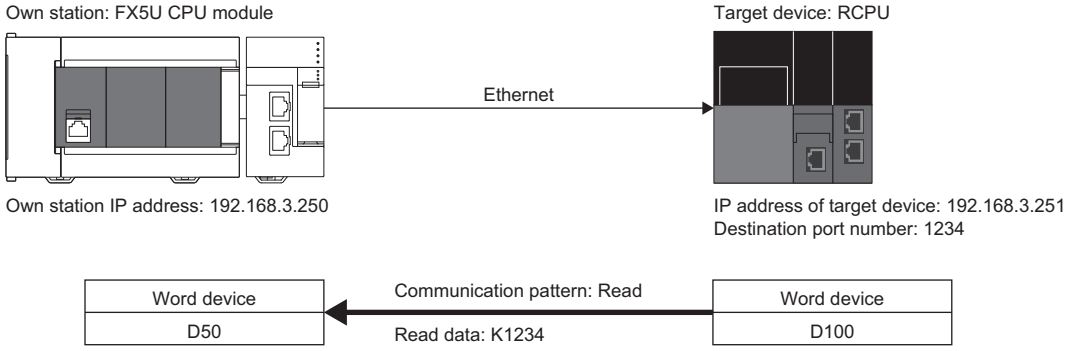
Use M+FX5CCLGNMS_SLMP_DeviceRead_IP (Reading of SLMP-compatible device) to read the device data specified by the target device.

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D100 of the target device is read into device D50 of the own station.



Preliminary setting

Set K1234 in device D100 of the target device.

Parameter setting

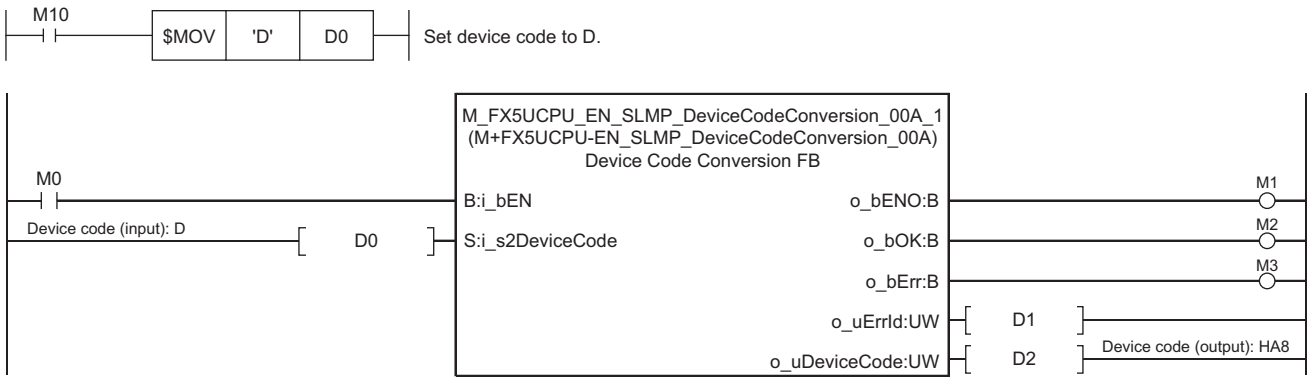
The own station IP address and SLMP communication settings are set using GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

Program

The device read out from the target device is converted into a binary code. After the conversion, the data from the device specified by the target device is read with M+FX5CCLGNMS_DeviceRead_IP (Reading of SLMP-compatible device).

• Convert the device code to the binary code.

In M+FX5CCLGNMS_SLMP_DeviceRead_IP (Reading of SLMP-compatible device), the device to be read is specified with a binary code. Therefore, the device to read is converted into a binary code with M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB). In this example, the data is read from D100 of the target device, so the device code "D" is converted into a binary code. For details on FB, refer to ☞ Page 65 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB).

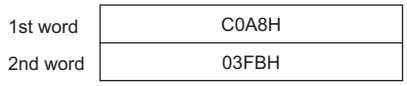


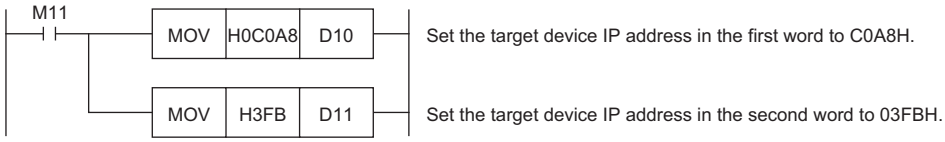
• Setting the IP address of the target device

Set the IP address of the target device to 192.168.3.251. Specify the first and second octets to the 1st word, and third and fourth octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (1st word)	192	C0
Second octet (1st word)	168	A8
Third octet (2nd word)	3	03
Fourth octet (2nd word)	251	FB

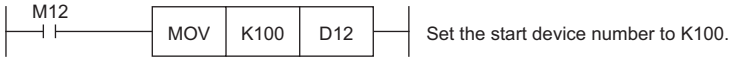
Set as shown below for this usage example.





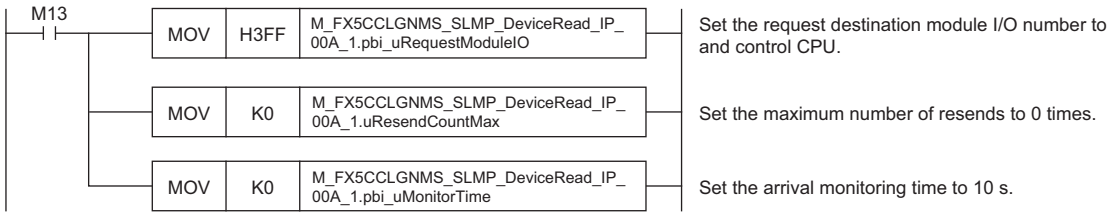
• Setting the head device number

Set the head device number of the device to read in D12.



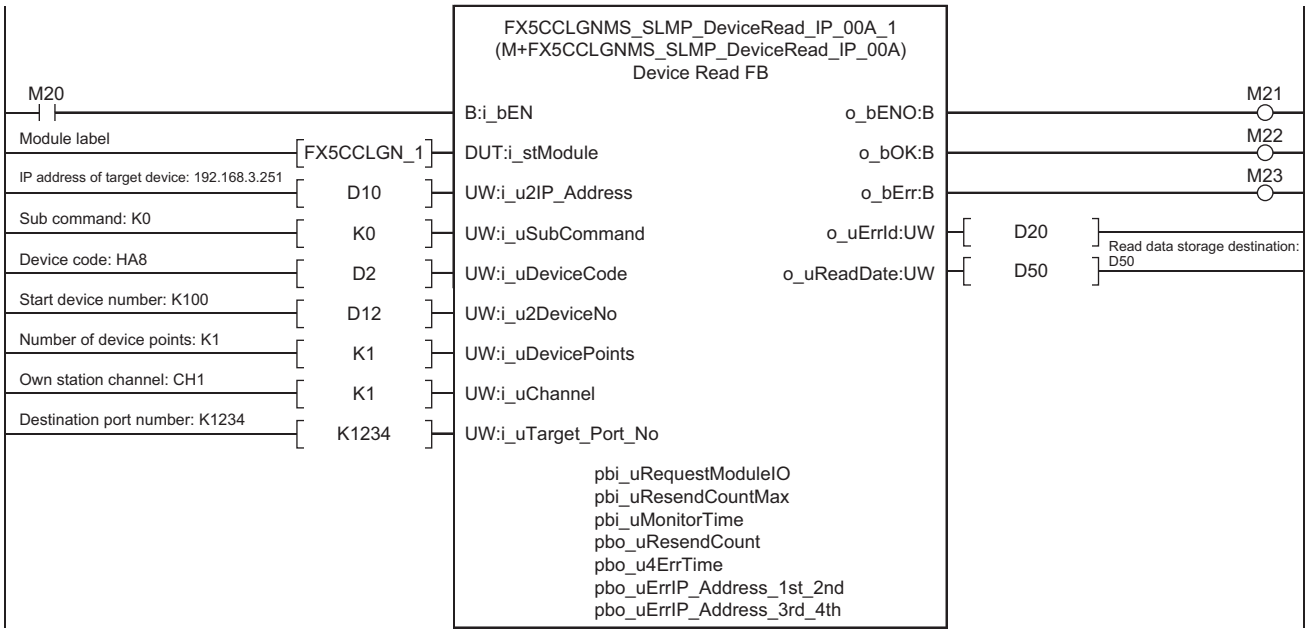
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_SLMP_DeviceRead_IP (Reading of SLMP-compatible device) FB.



• Setting and executing reading of SLMP-compatible device

The value from target device D100 is read using M+FX5CCLGNMS_SLMP_DeviceRead_IP (Reading of SLMP-compatible device) FB. The read value is stored in the own station's device D50.



7.12 M+FX5CCLGNMS_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device)

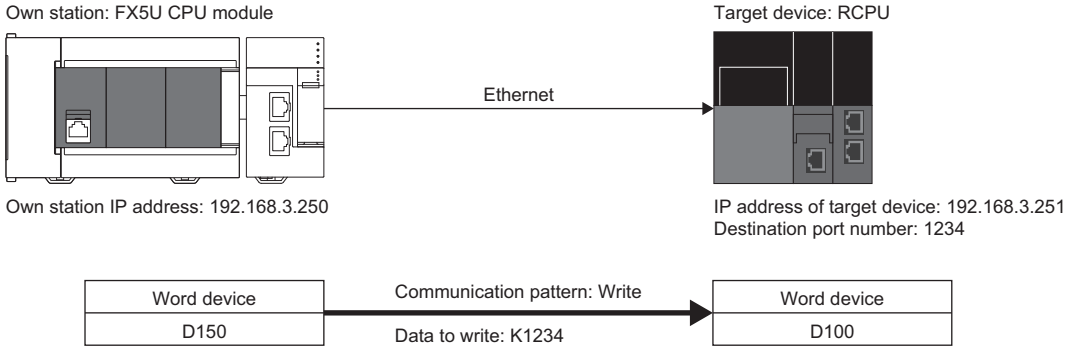
The data is written to the device specified by the target device using M+FX5CCLGNMS_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device).

System configuration

Refer to ☞ Page 16 System Configuration.

Outline of example of program

The value stored in device D150 of the own station is written to device D100 of the target device.



Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

The own station IP address and SLMP communication settings are set using GX Works3. Refer to the 📖MELSEC iQ-F FX5 CC-Link IE TSN Master/Local Module User's Manual for details on the setting method.

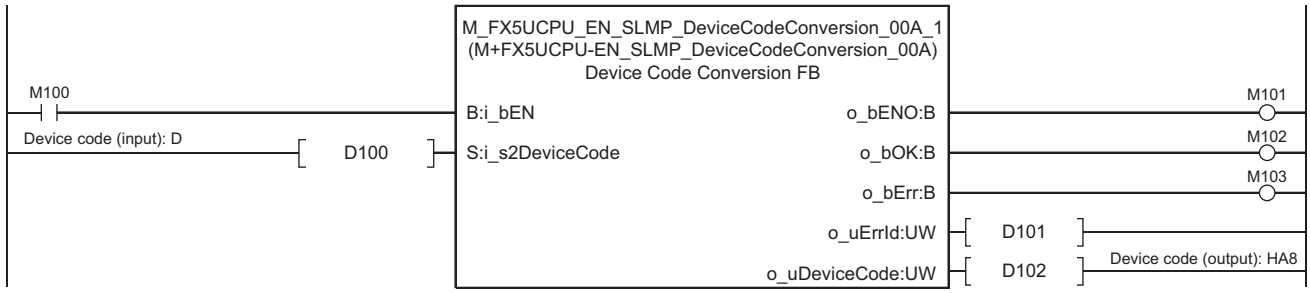
Program

The device written to the target device is converted into a binary code. After the conversion, the data from the device specified by the target device is written using M+FX5CCLGNMS_DeviceWrite_IP (Writing to SLMP-compatible device).

• Convert the device code to the binary code.

In M+FX5CCLGNMS_SLMP_DeviceWrite_IP (Writing to SLMP-compatible device), the device to be written is specified with a binary code. Therefore, the device to write is converted into binary code with M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB). In this example, the data is written into D100 of the target device, so the device code "D" is converted into binary code. For details on FB, refer to ☞ Page 65 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of device code for SLMP communication FB).



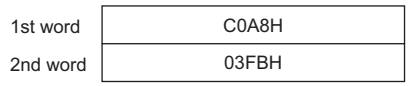


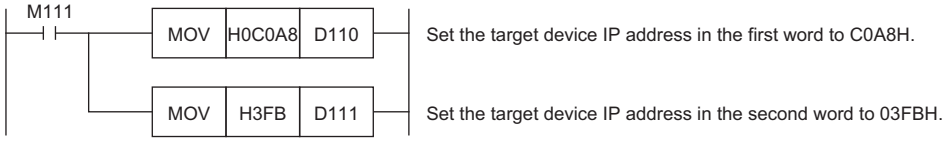
• Setting the IP address of the target device

Set the IP address of the target device to 192.168.3.251. Specify the first and second octets to the 1st word, and third and fourth octets to the 2nd word. The value must be converted from decimal to hexadecimal.

Item	Decimal	Hexadecimal
First octet (1st word)	192	C0
Second octet (1st word)	168	A8
Third octet (2nd word)	3	03
Fourth octet (2nd word)	251	FB

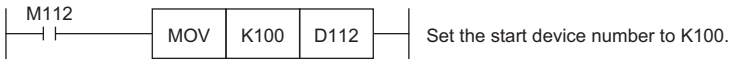
Set as shown below for this usage example.





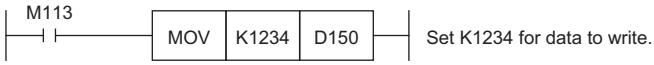
• Setting the head device number

Set the head device number of the device to read in D112.



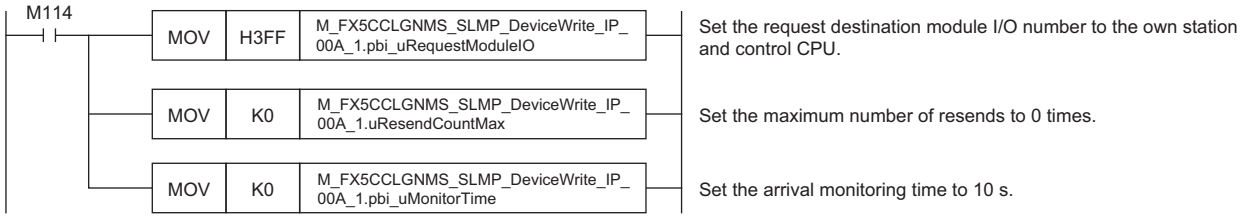
• Setting the write data storage destination

Set the data K1234 to be written to D150.



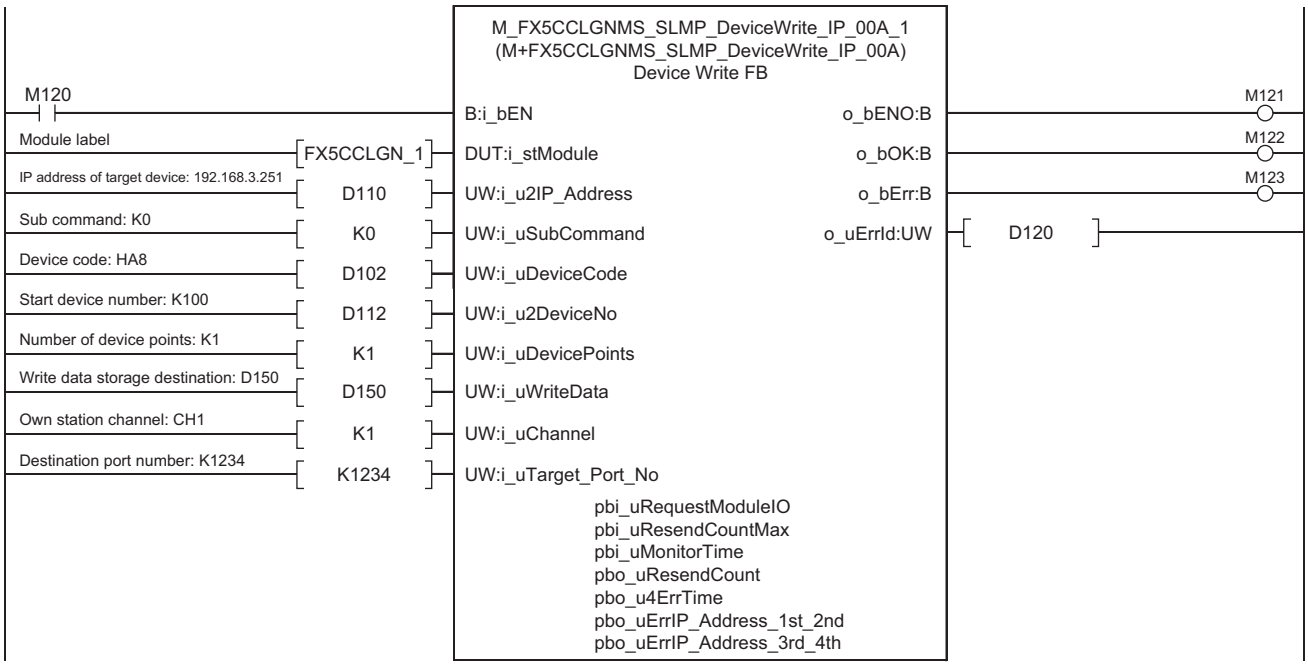
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_DeviceWrite_IP (Writing to SLMP-compatible device) FB.



• Setting and executing writing to SLMP-compatible device

The value stored in the own station D150 is written into the set target device D100 using M+FX5CCLGNMS_DeviceWrite_IP (Writing to SLMP-compatible device) FB.



7.13 M+FX5-EIP_Class1GetInputData, M+FX5-EIP_Class1SetOutputData (Class1 communications)

Performs Class1 communications between the FX5-EIP and EtherNet/IP devices using M+FX5-EIP_Class1GetInputData (Class1 communications input data acquisition) and M+FX5-EIP_Class1SetOutputData (Class1 communications output data setting).

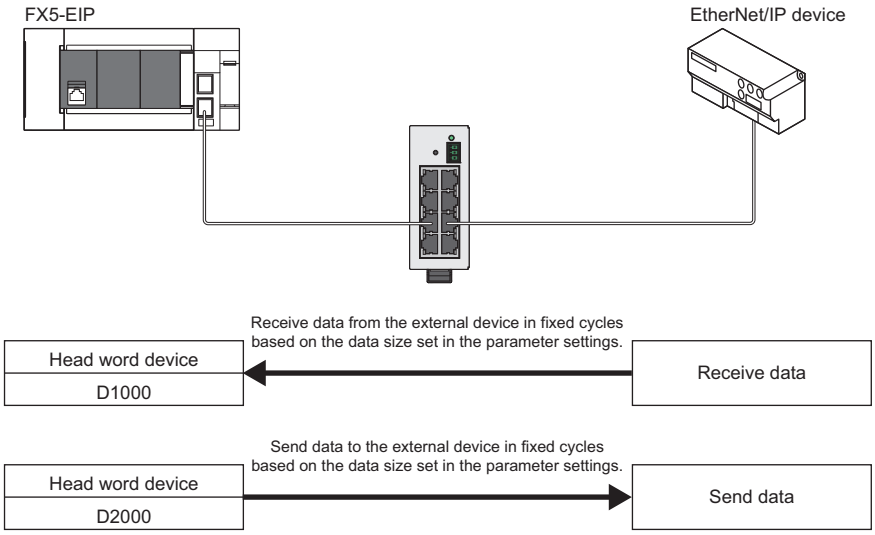
Outline of example of program

• M+FX5-EIP_Class1GetInputData

Reads the input data received from the external device into D1000 based on the data size of Connection No.1 (20 bytes) set in the parameter settings.

• M+FX5-EIP_Class1SetOutputData

Writes the output data set in D2000 or later into the external device based on the data size of Connection No.1 (20 bytes) set in the parameter settings.



Parameter setting

Set the parameters using GX Works3.

Use the same instance ID as the external device.

For the parameter settings for the external device, refer to the manual for the external device used.

For details on the parameter settings, refer to the following.

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

1. Set the IP address of the FX5-EIP.

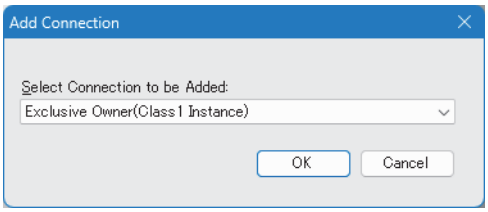
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-EIP] ⇨ [Module Parameter] ⇨ [Basic Settings]

IP address: 192.168.3.5

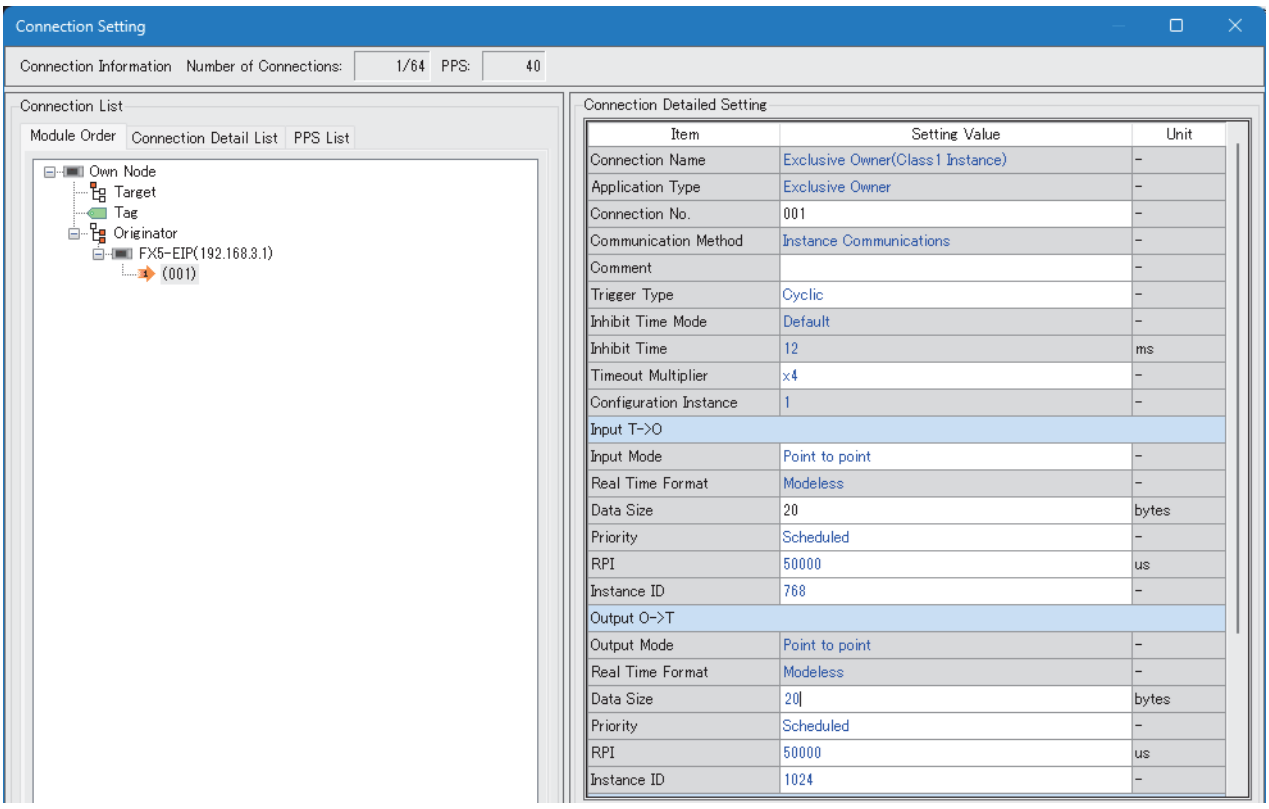
Do not change the settings for auto refresh.

2. Open the connection setting, and select [Exclusive Owner(Class1 Instance)] from [Add Connection].

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



3. Configure settings for the connection detail.



Item		Set value
Connection No.		001
Input T->O	Data size (byte)	20
Output O->T	Data size (byte)	20

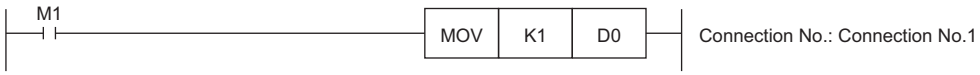
Program

■M+FX5-EIP_Class1GetInputData

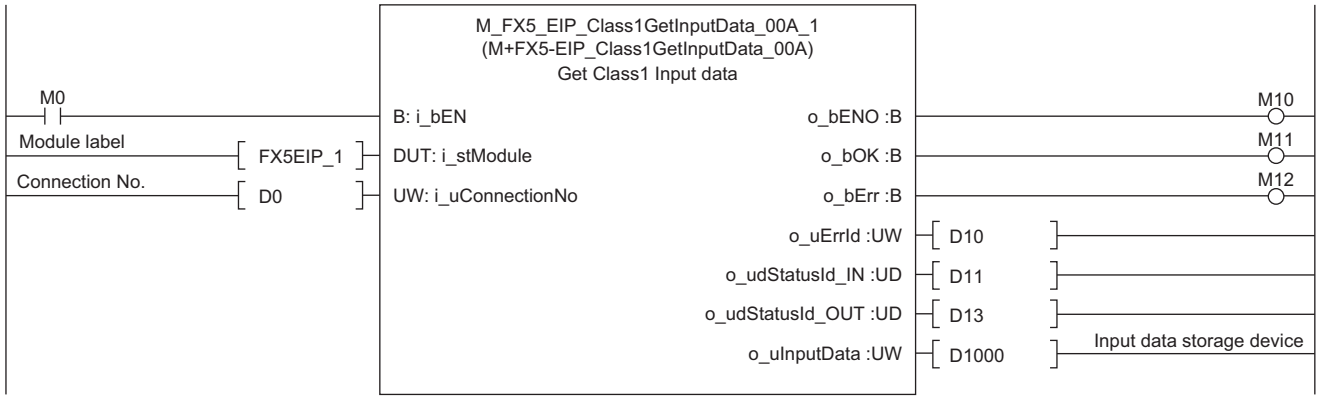
• Devices to be used

Device	Description	Set value
M0	Execution command	—
D0	Connection No.	K1
M10	Execution status	—
M11	Normal completion	—
M12	Error completion	—
D10	Error code	—
D11, D12	Error code of connection communication error on the input side	—
D13, D14	Error code of connection communication error on the output side	—
D1000 to D1009	Input data storage device	—

Set the input label by turning on M1.



Turning on M0 executes the FB, and starts EtherNet/IP communications by setting the data of Connection No.1.
While the FB operates normally, the input data received from the external device is stored in D1000 or later based on the data size set in Connection No.1 with the parameter settings, then M11 turns on.

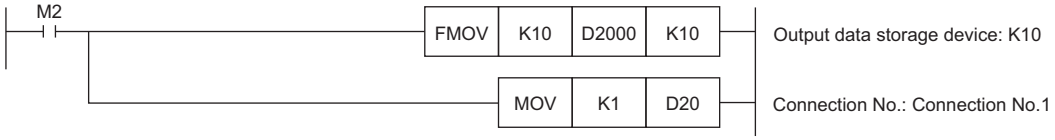


■M+FX5-EIP_Class1SetOutputData

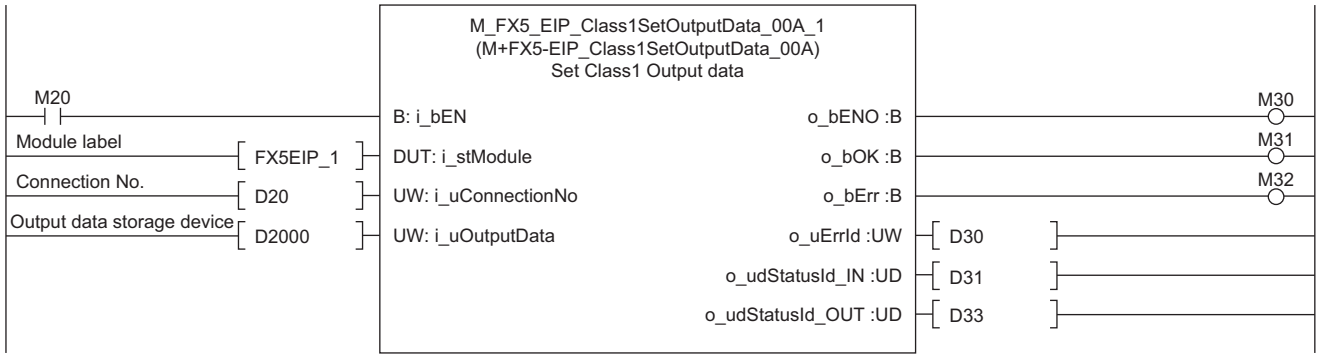
• Devices to be used

Device	Description	Set value
M20	Execution command	—
D20	Connection No.	K1
D2000 to D2009	Output data storage device	—
M30	Execution status	—
M31	Normal completion	—
M32	Error completion	—
D30	Error code	—
D31, D32	Error code of connection communication error on the input side	—
D33, D34	Error code of connection communication error on the output side	—

Set the input label by turning on M2.



Turning on M20 executes the FB, and starts EtherNet/IP communications by setting the data of Connection No.1.
While the FB operates normally, the output data set for D2000 or later is sent to the external device based on the data size set in Connection No.1 with the parameter settings, then M31 turns on.



7.14 M+FX5-EIP_UCMMOriginator_ReadTagData, M+FX5-EIP_UCMMOriginator_WriteTagData (UCMM tag communications)

Performs UCMM tag communications between the FX5-EIP and EtherNet/IP devices usinig M+FX5-EIP_UCMMOriginator_ReadTagData (UCMM tag communications data acquisition) and M+FX5-EIP_UCMMOriginator_WriteTagData (UCMM tag communications data setting).

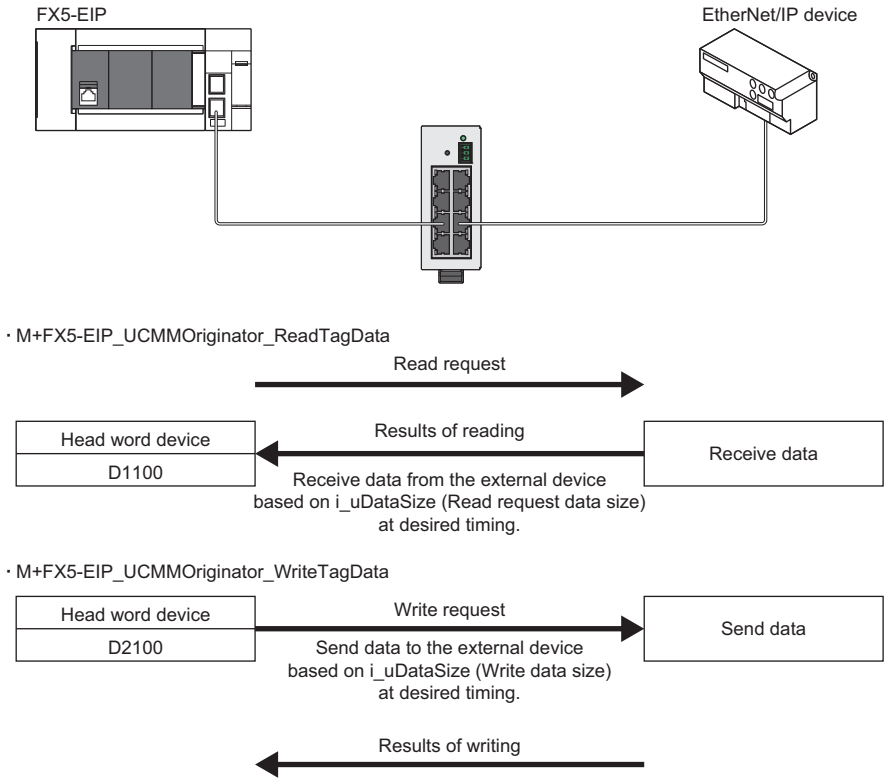
Outline of example of program

• M+FX5-EIP_UCMMOriginator_ReadTagData

Reads the input data received from the external device into D1100 based on i_uDataSize (Read request data size) (10 words) using Connection No.2.

• M+FX5-EIP_UCMMOriginator_WriteTagData

Writes the output data stored in D2100 or later into the external device based on i_uDataSize (Write data size) (10 words) using Connection No.3.



Parameter setting

Set the parameters using GX Works3.

For the parameter settings for the external device, refer to the manual for the external device used.

For details on the parameter settings, refer to the following.

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

1. Set the IP address of the FX5-EIP.

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

IP address: 192.168.3.5

Do not change the settings for auto refresh.

Ensure that Connection No.2 and Connection No.3 do not have connection settings.

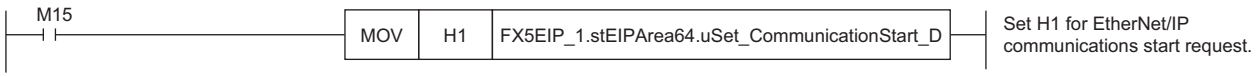
Program

■M+FX5-EIP_UCMMOriginator_ReadTagData

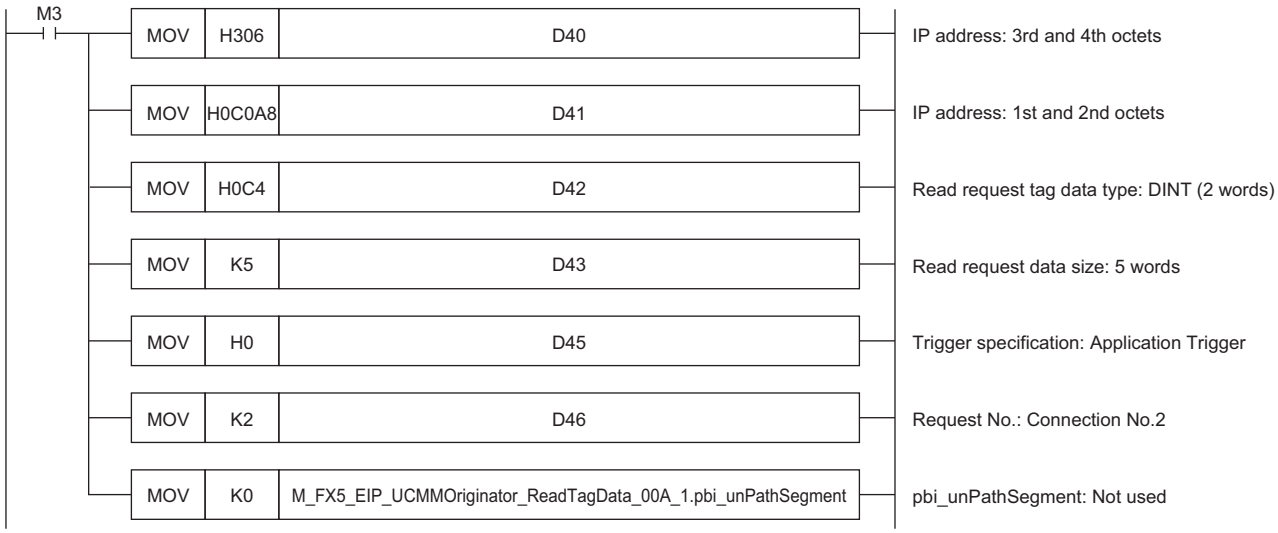
- Devices to be used

Device	Description	Set value
M40	Execution command	—
D40	IP address (third and fourth octets)	H306
D41	IP address (first and second octets)	H0C0A8
D42	Read request tag data type	H0C4
D43	Read request data size	K5
D45	Trigger specification	H0
D46	Request No.	K2
M50	Execution status	—
M51	Normal completion	—
M52	Error completion	—
D50	Error code	—
D51	Error code of communication error	—
D52	Read tag data type	—
D53	Read data size	—
D1100 to D1109	Read data storage device	—

Set EtherNet/IP communications start request (U\G272) by turning on M15.

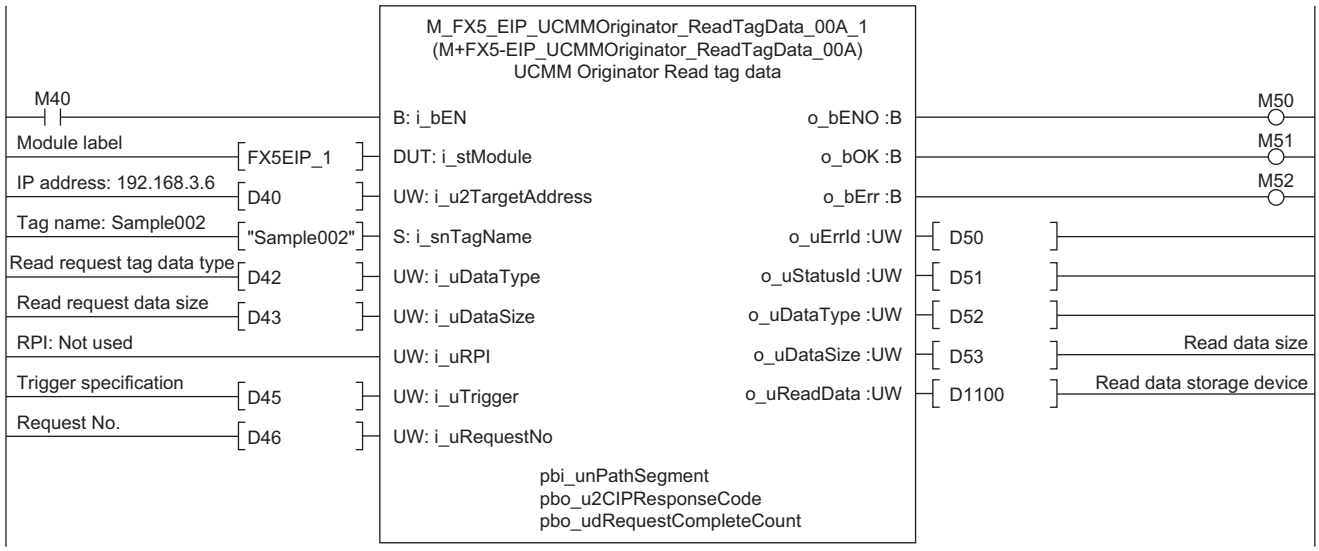


Set the input labels and operation parameters by turning on M3.



Executes the FB by turning on M40, and sends Read request to the external device side.

Once the FB execution completes normally, the input data received from the external device is stored in D1100 or later based on i_uDataSize (Read request data size), then M51 turns on.

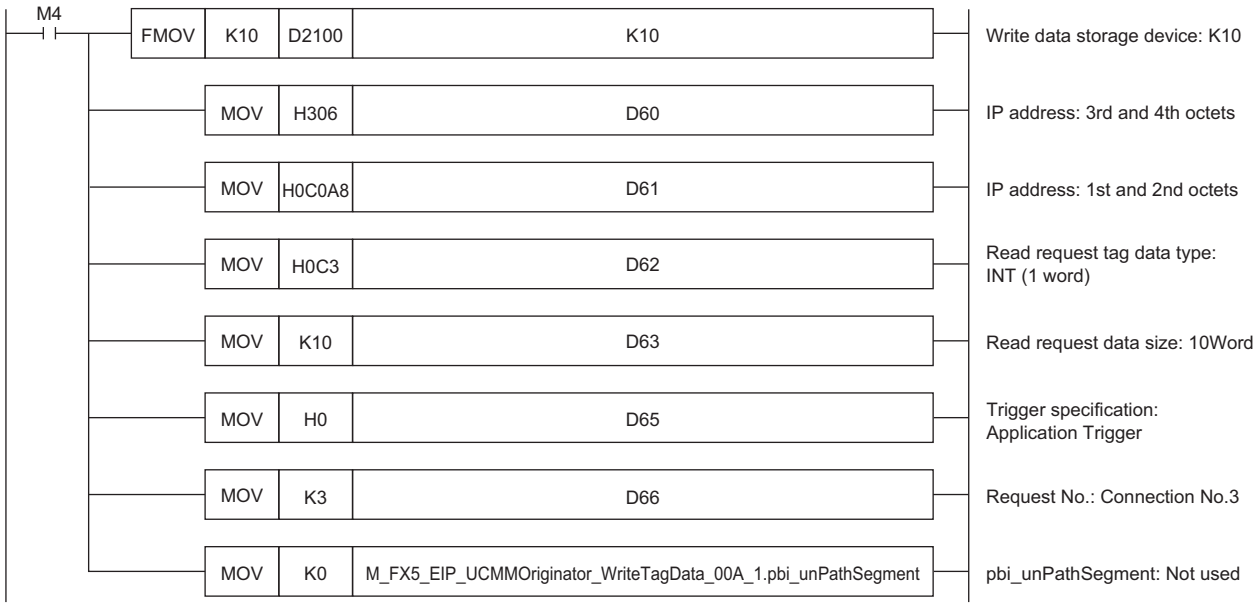


■M+FX5-EIP_UCMMOriginator_WriteTagData

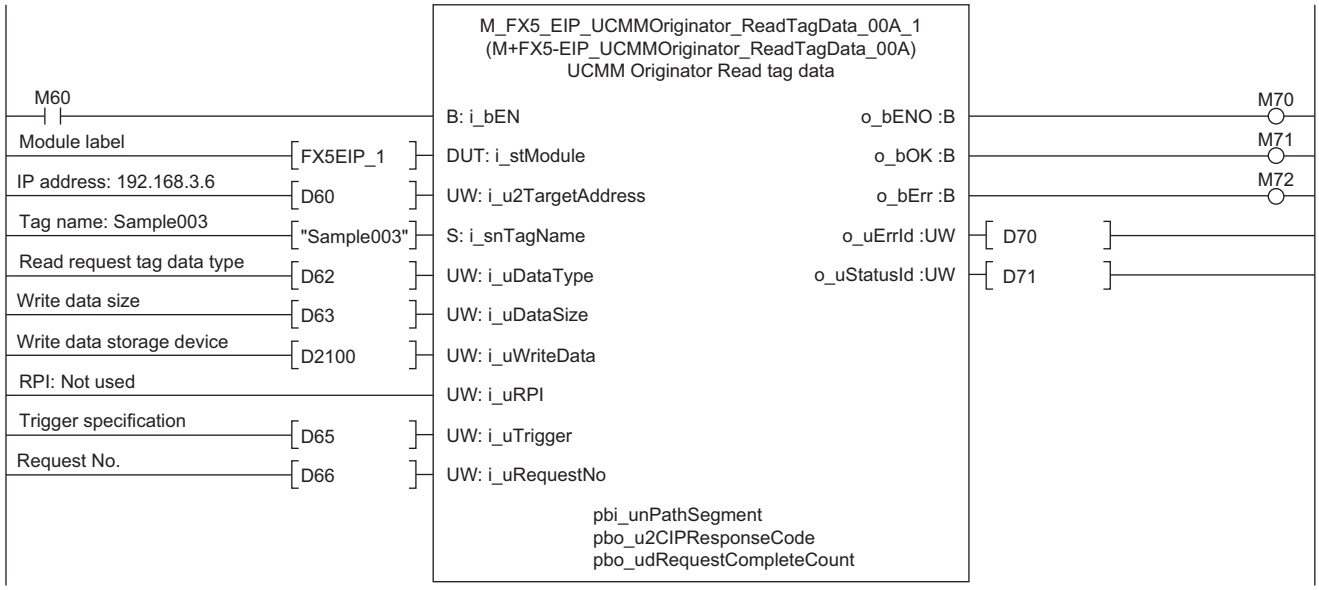
- Devices to be used

Device	Description	Set value
M60	Execution command	—
D60	IP address (third and fourth octets)	H306
D61	IP address (first and second octets)	H0C0A8
D62	Tag data type	H0C3
D63	Write data size	K10
D2100 to D2109	Write data storage device	Optional
D65	Trigger specification	H0
D66	Request No.	K3
M70	Execution status	—
M71	Normal completion	—
M72	Error completion	—
D70	Error code	—
D71	Error code of communication error	—

Set the input labels and operation parameters by turning on M4.



Executes the FB by turning on M60, and sends Write request to the external device side.
Once the FB execution completes normally, the output data set for D2100 or later is sent to the external device based on i_uDataSize (Write data size), then M71 turns on.



7.15 M+FX5-EIP_Class3Originator_ReadTagData, M+FX5-EIP_Class3Originator_WriteTagData (Class3 Tag communications)

Performs Class3 tag communications between the FX5-EIP and EtherNet/IP devices using M+FX5-EIP_Class3Originator_ReadTagData (Class3 tag communications data acquisition) and M+FX5-EIP_Class3Originator_WriteTagData (Class3 tag communications data setting).

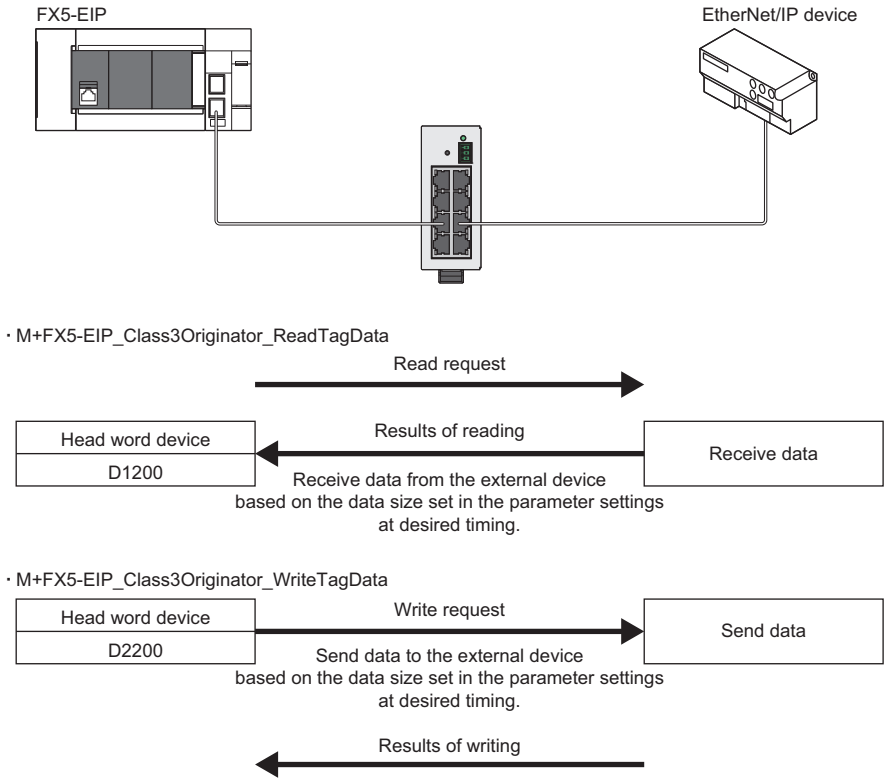
Outline of example of program

• M+FX5-EIP_Class3Originator_ReadTagData

The input data received from the external device is read into D1200 based on the data size of Connection No.4 (20 bytes) set in the parameter settings.

• M+FX5-EIP_Class3Originator_WriteTagData

Writes the output data stored in D2200 or later into the external device based on the data size of Connection No.5 (20 bytes) set in the parameter settings.



Parameter setting

Set the parameters using GX Works3.

For the parameter settings for the external device, refer to the manual for the external device used.

For details on the parameter settings, refer to the following.

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

1. Set the IP address of the FX5-EIP.

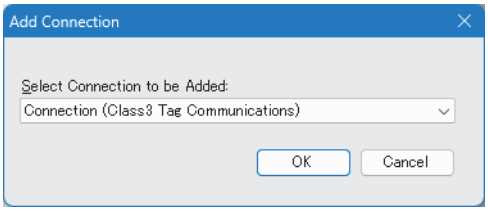
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-EIP] ⇨ [Module Parameter] ⇨ [Basic Settings]

IP address: 192.168.3.5

Do not change the settings for auto refresh.

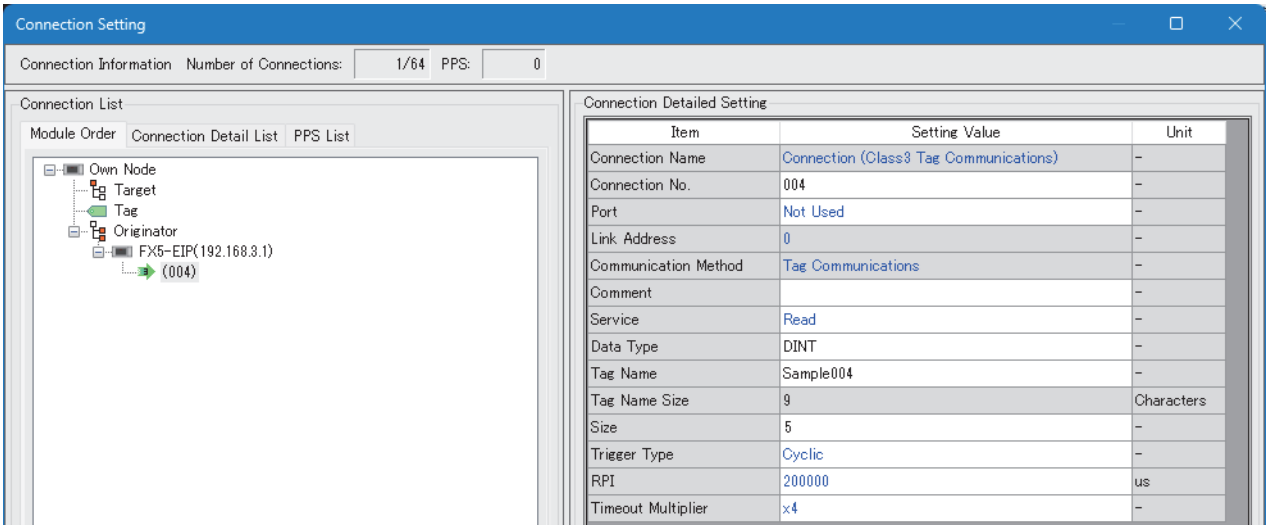
2. Open the connection setting, and select [Connection (Class3 Tag Communications)] from [Add Connection].

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



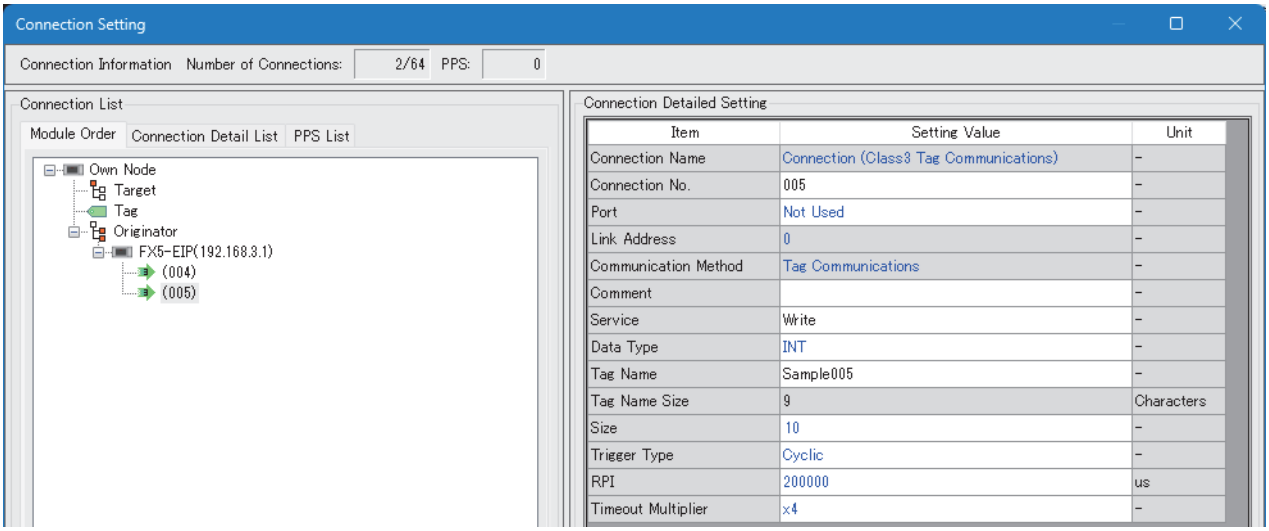
3. Configure settings for the connection detail.

• Connection No.4



Item	Set value
Connection No.	004
Service	Read
Tag name	Sample004
Data type	DINT
Data size	5

• Connection No.5



Item	Set value
Connection No.	005
Service	Write
Tag name	Sample005
Data type	INT
Data size	10

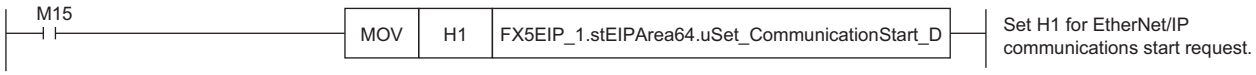
Program

■M+FX5-EIP_Class3Originator_ReadTagData

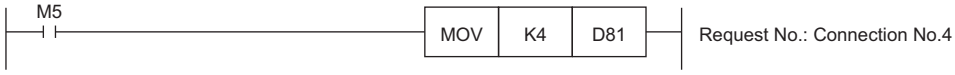
• Devices to be used

Device	Description	Set value
M80	Execution command	—
D81	Request No.	K4
M90	Execution status	—
M91	Normal completion	—
M92	Error completion	—
D90	Error code	—
D91	Error code of communication error	—
D1200 to D1209	Read data storage device	—
D92	Read data size	—

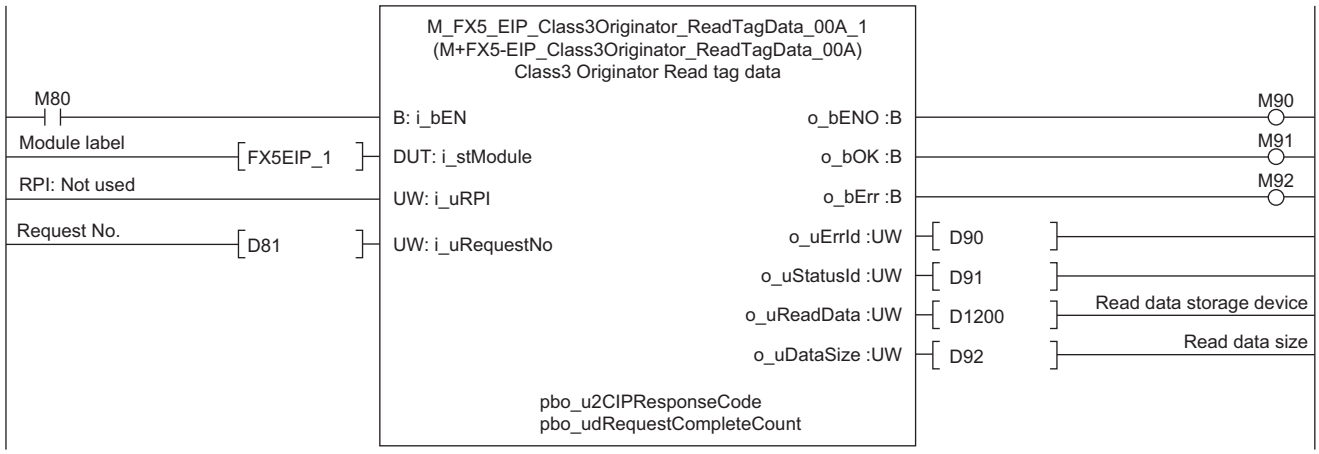
Set EtherNet/IP communications start request (U\G272) by turning on M15.



The input label is set by turning on M5.



Executes the FB by turning on M80, and sends Read request to the external device side.
Once the FB execution completes normally, the input data received from the external device is stored in D1200 or later based on the data size set in Connection No.4, then M91 turns on.

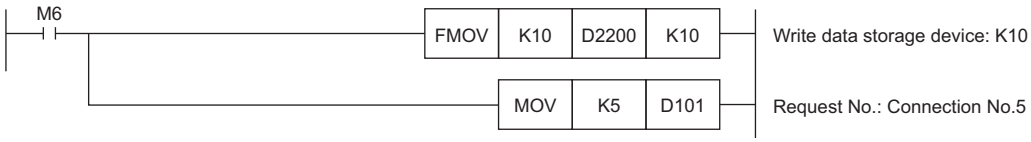


■M+FX5-EIP_Class3Originator_WriteTagData

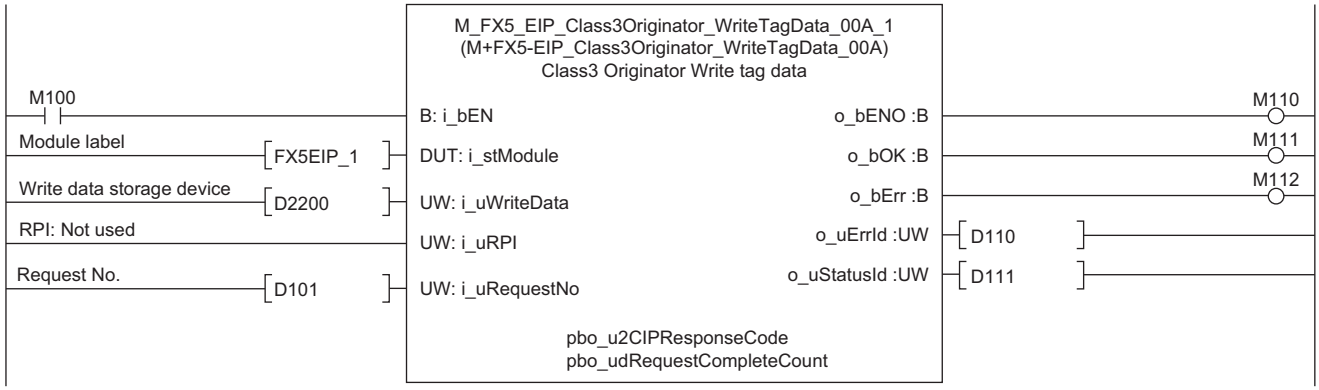
• Devices to be used

Device	Description	Set value
M100	Execution command	—
D2200 to D2209	Write data storage device	—
D101	Request No.	K5
M110	Execution status	—
M111	Normal completion	—
M112	Error completion	—
D110	Error code	—
D111	Error code of communication error	—

Set the input labels and operation parameters by turning on M6.



Executes the FB by turning on M100, and sends Write request to the external device side.
Once the FB execution completes normally, the output data set for D2200 or later is sent to the external device based on the data size set in Connection No.5, then M111 turns on.



7.16 M+FX5-EIP_UCMMOriginator_MessageSend (UCMM instance communications)

Performs UCMM tag communications between the FX5-EIP and EtherNet/IP devices usinig M+FX5-EIP_UCMMOriginator_MessageSend (Sending of UCMM communications message).

Outline of example of program

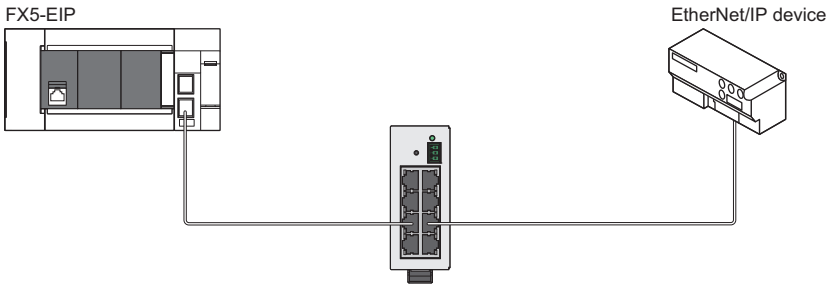
• M+FX5-EIP_UCMMOriginator_MessageSend (Reading Identity object)

Reads Identity object of the external device into D1300 using Connection No.6.

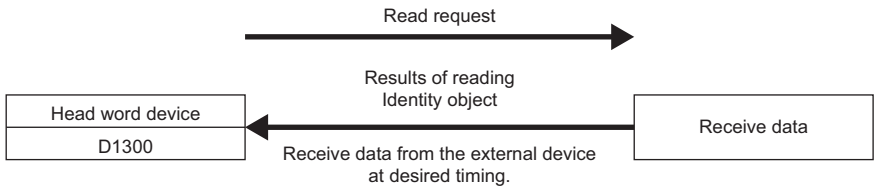
• M+FX5-EIP_UCMMOriginator_MessageSend (Writing Encapsulation Inactivity Timeout)

Writes Encapsulation Inactivity Timeout set for the input label to the external device using Connection No.7.

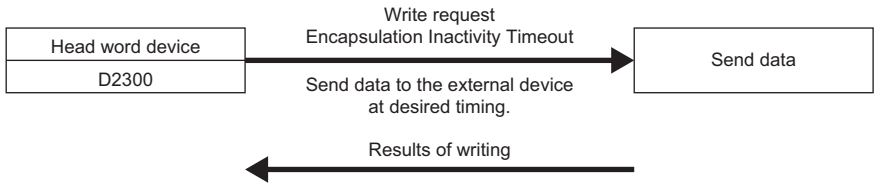
For the command support state and communication data size, refer to the manual for the external device used.



・M+FX5-EIP_UCMMOriginator_MessageSend (Reading Identity object)



・M+FX5-EIP_UCMMOriginator_MessageSend (Writing Encapsulation Inactivity Timeout)



Parameter setting

Set the parameters using GX Works3.

For the parameter settings for the external device, refer to the manual for the external device used.

For details on the parameter settings, refer to the following.

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

1. Set the IP address of the FX5-EIP.

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

IP address: 192.168.3.5

Do not change the settings for auto refresh.

Ensure that Connection No.6 and Connection No.7 do not have connection settings.

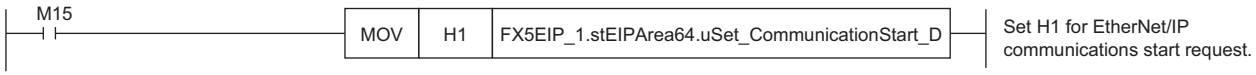
Program

■M+FX5-EIP_UCMMOriginator_MessageSend (Reading Identity object)

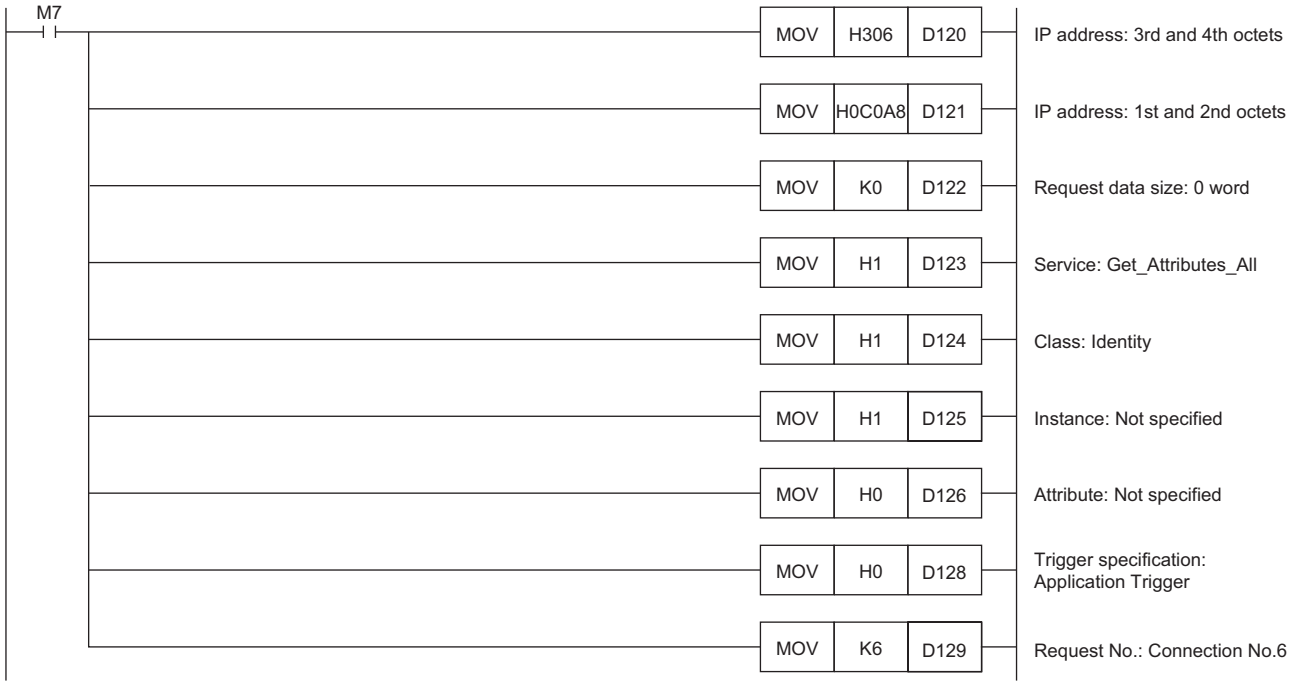
• Devices to be used

Device	Description	Set value
M120	Execution command	—
D120	IP address (third and fourth octets)	H306
D121	IP address (first and second octets)	H0C0A8
D122	Request data size	K0
D123	Service	H1
D124	Class	H1
D125	Instance	H1
D126	Attribute	H0
D128	Trigger specification	H0
D129	Request No.	K6
M130	Execution status	—
M131	Normal completion	—
M132	Error completion	—
D130	Error code	—
D131	Error code of communication error	—
D1300 to D1309	Response data storage device	—
D132	Response data size	—

Set EtherNet/IP communications start request (U\G272) by turning on M15.



The input label is set by turning on M7.



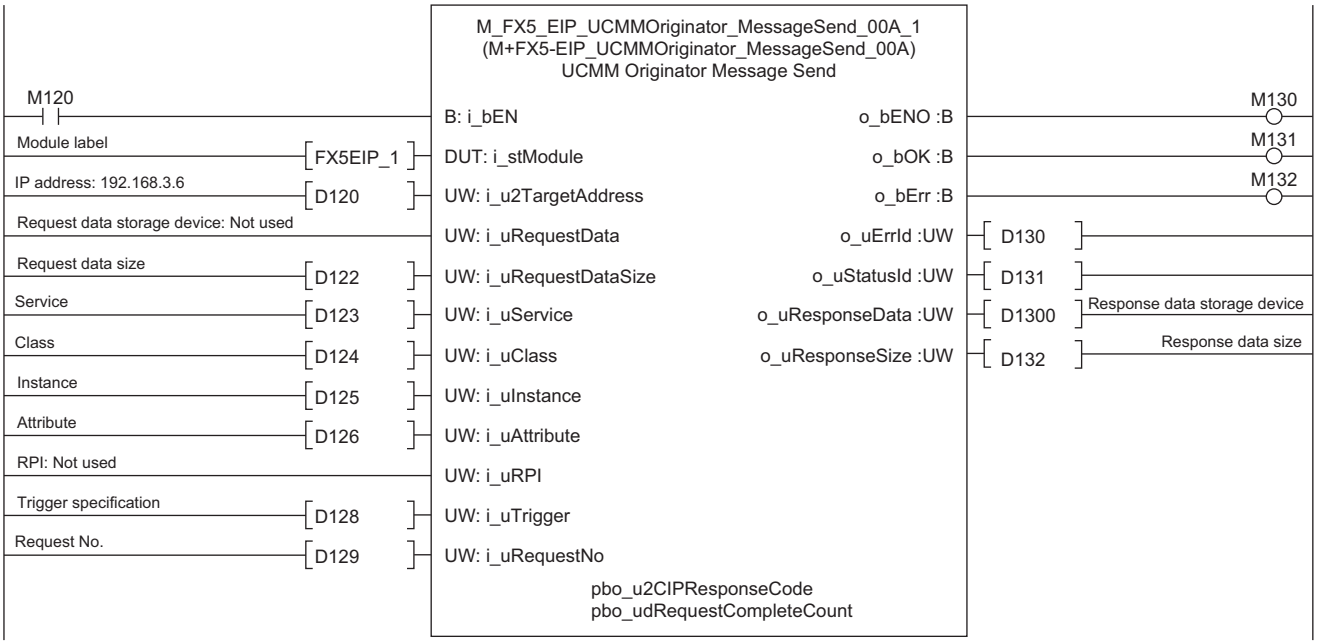
Executes the FB by turning on M120, and sends the following request command to the external device side.

Item	Specified data	Description*1
Class ID	H1	Specifies Identity object.
Instance ID	H1	—
Service code	H1	Get_Attributes_All (Acquires all attributes possessed by the instance specified by Class ID or Instance ID.)
Attribute ID	H0	For Get_Attributes_All, no specific Attribute ID is specified.
Request data	K0	Specifies 0 for the request data size.

*1 For Class ID, Instance ID, Service code, and Attribute ID, refer to the manual for the external device used because the support detail varies depending on the external device.

Once the FB execution completes normally, Identity object received from the external device is stored in D1300 or later, then M131 turns on.

When the response data size is an odd number, the data of only the lower 1 byte of the end device is stored.

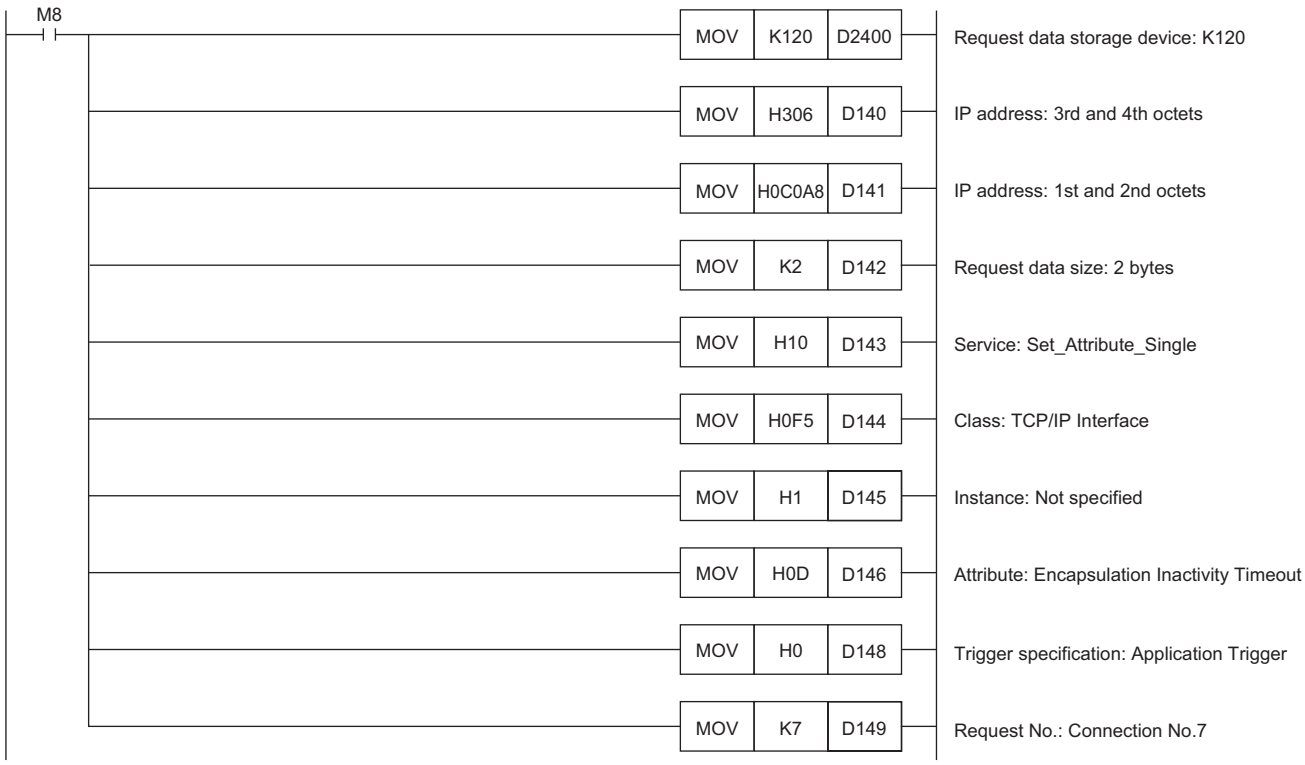


■M+FX5-EIP_UCMMOriginator_MessageSend (Writing Encapsulation Inactivity Timeout)

• Devices to be used

Device	Description	Set value
M140	Execution command	—
D140	IP address (third and fourth octets)	H306
D141	IP address (first and second octets)	H0C0A8
D2400	Request data storage device	K120
D142	Request data size	K2
D143	Service	H10
D144	Class	H0F5
D145	Instance	H1
D146	Attribute	H0D
D148	Trigger specification	H0
D149	Request No.	K7
M150	Execution status	—
M151	Normal completion	—
M152	Error completion	—
D150	Error code	—
D151	Error code of communication error	—

The input label is set by turning on M8.

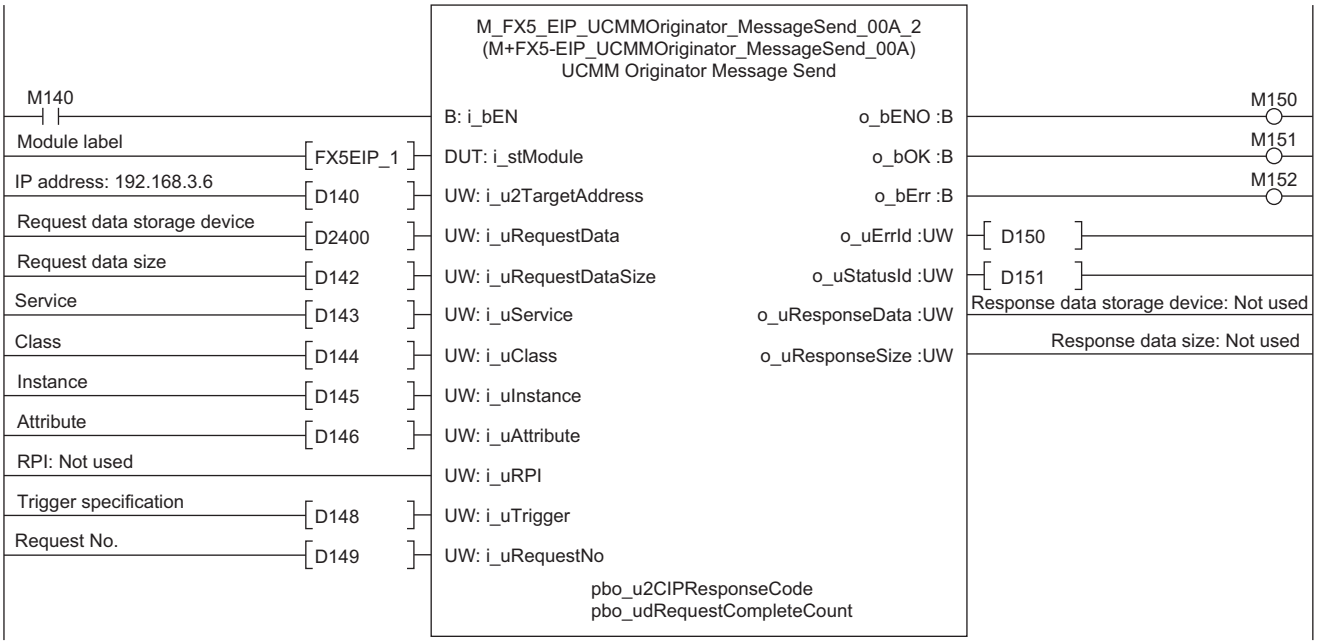


Executes the FB by turning on M140, and sends the following request command to the external device side.

Item	Specified data	Description*1
Class ID	H0F5	Specifies TCP/IP Interface object.
Instance ID	H1	—
Service code	H10	Set_Attribute_Single (Sets one attribute possessed by the instance specified by Class ID or Instance ID.)
Attribute ID	H0D	Specifies Encapsulation Inactivity Timeout.
Request data	K20	—

*1 For Class ID, Instance ID, Service code, and Attribute ID, refer to the manual for the external device used because the support detail varies depending on the external device.

Once the FB execution completes normally, Encapsulation Inactivity Timeout set for the input label is sent to the external device, then M151 turns on.



7.17 M+FX5-EIP_Class3Originator_MessageSend (Class3 instance communications)

Performs Class3 tag communications between the FX5-EIP and EtherNet/IP devices using M+FX5-EIP_Class3Originator_MessageSend (Sending of Class3 communications message).

Outline of example of program

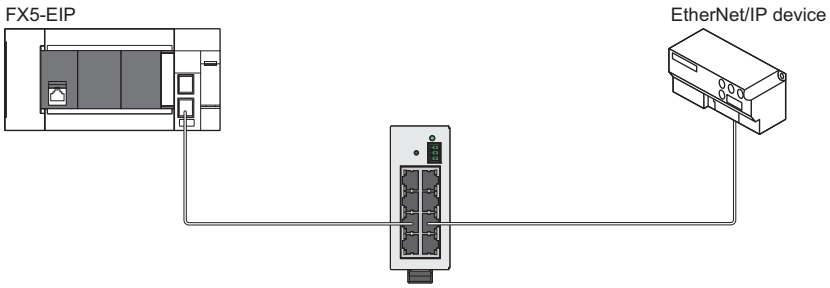
• M+FX5-EIP_Class3Originator_MessageSend (Reading Identity object)

Reads Identity object of the external device of Connection No.8 into D1500.

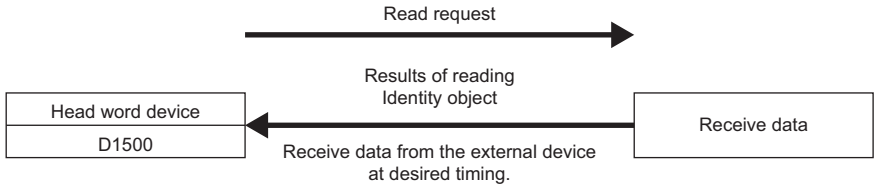
• M+FX5-EIP_Class3Originator_MessageSend (Writing Encapsulation Inactivity Timeout)

Writes Encapsulation Inactivity Timeout of the external device of Connection No.9 to the external device.

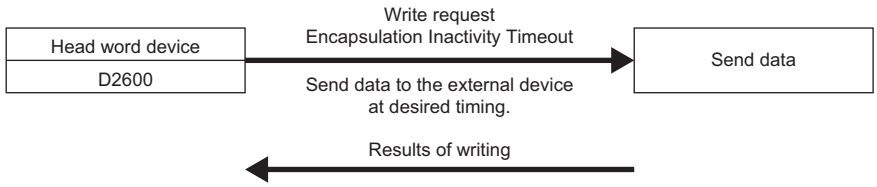
For the command support state and communication data size, refer to the manual for the external device used.



・M+FX5-EIP_Class3Originator_MessageSend (Reading Identity object)



・M+FX5-EIP_Class3Originator_MessageSend (Writing Encapsulation Inactivity Timeout)



Parameter setting

Set the parameters using GX Works3.

For the parameter settings for the external device, refer to the manual for the external device used.

For details on the parameter settings, refer to the following.

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

1. Set the IP address of the FX5-EIP.

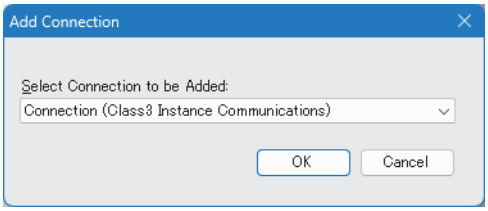
Navigation window ⇨ [Parameter] ⇨ [Module Information] ⇨ [FX5-EIP] ⇨ [Module Parameter] ⇨ [Basic Settings]

IP address: 192.168.3.5

Do not change the settings for auto refresh.

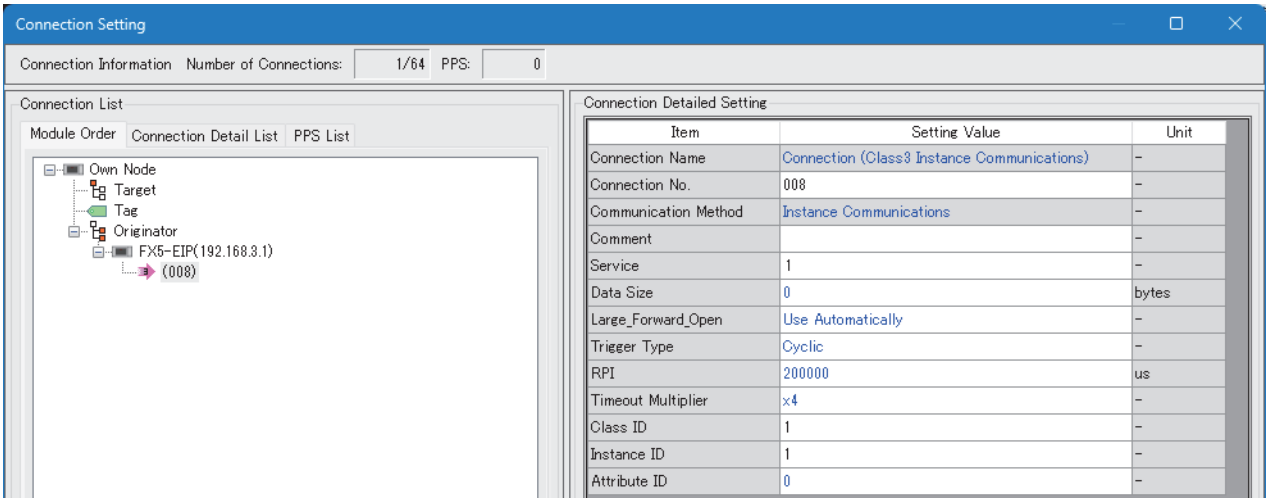
2. Open the connection setting. Select [Connection (Class3 Instance Communications)] from [Add Connection].

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



3. Configure settings for the connection detail.

- Connection No.8



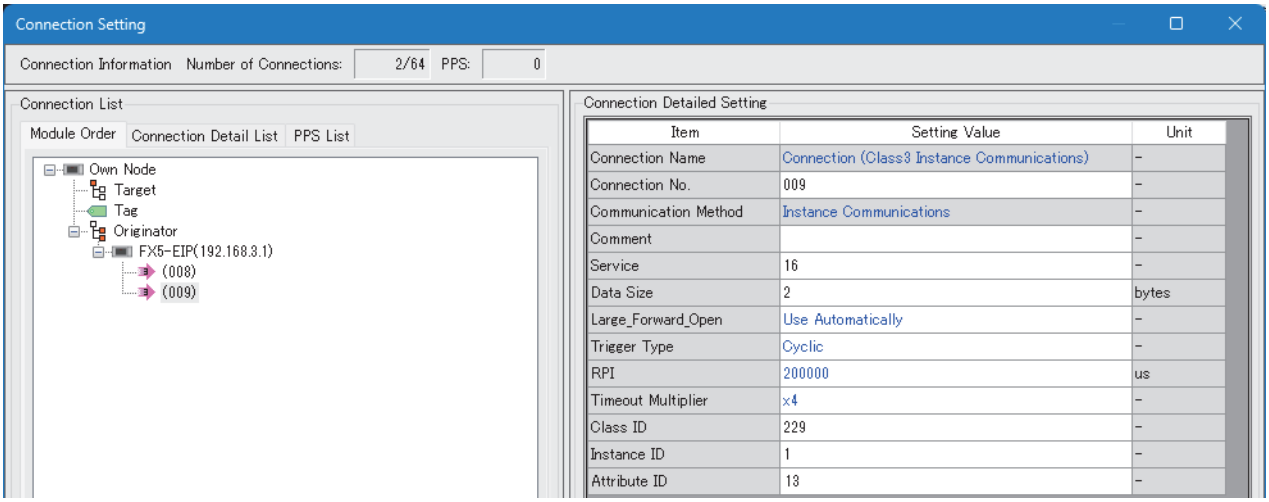
Item	Set value
Connection No.	008
Service	1*1
Class ID	1*2
Instance ID	1
Attribute ID	0*3

*1 Get_Attributes_All (Acquires all attributes possessed by the instance specified by Class ID or Instance ID.)

*2 Specifies Identity object.

*3 Set_Attribute_Single (Sets one attribute possessed by the instance specified by Class ID or Instance ID.)

• Connection No.9



Item	Set value
Connection No.	009
Service	16*1
Data size	2
Class ID	229*2
Instance ID	1
Attribute ID	13*3

*1 Get_Attributes_All (Acquires all attributes possessed by the instance specified by Class ID or Instance ID.)
*2 Specifies TCP/IP Interface object.
*3 Specifies Encapsulation Inactivity Timeout.

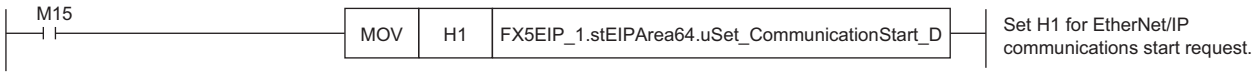
Program

■M+FX5-EIP_Class3Originator_MessageSend (Reading Identity object)

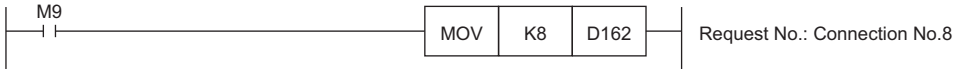
• Devices to be used

Device	Description	Set value
M160	Execution command	—
D162	Request No.	K8
M170	Execution status	—
M171	Normal completion	—
M172	Error completion	—
D170	Error code	—
D171	Error code of communication error	—
D1500 to D1530	Response data storage device	—
D172	Response data size	—

Set EtherNet/IP communications start request (U\G272) by turning on M15.



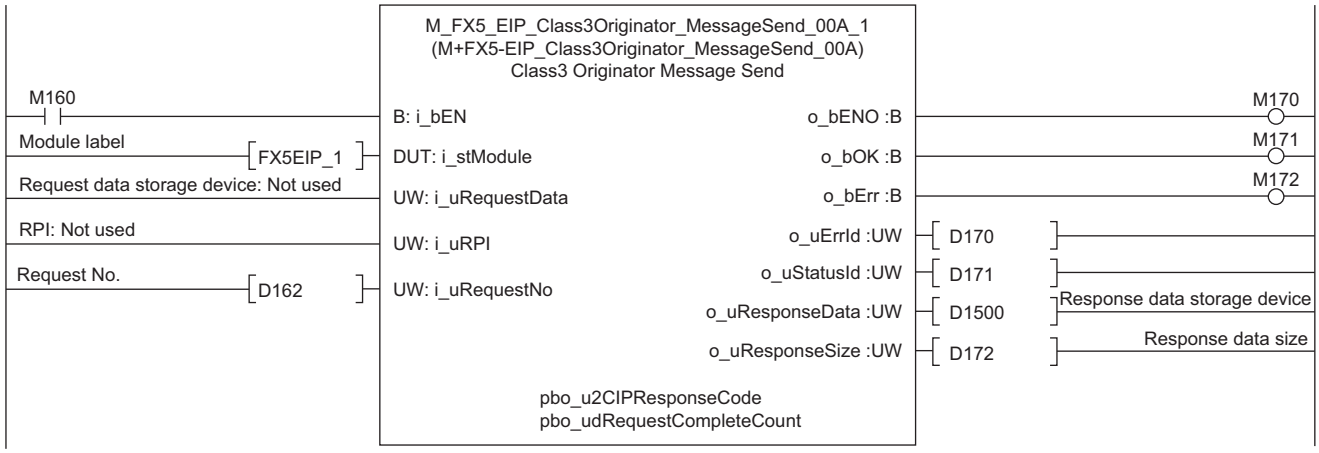
The input label is set by turning on M9.



Executes the FB by turning on M160, and sends request commands based on the parameter settings to the external device side.

Once the FB execution completes normally, the input data received from the external device is stored in D1500 or later based on the response data size set in Connection No.8, then M171 turns on.

When the response data size is an odd number, the data of only the lower 1 byte of the end device is stored.

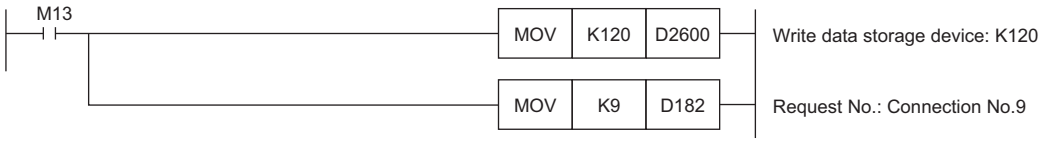


■M+FX5-EIP_Class3Originator_MessageSend (Writing Encapsulation Inactivity Timeout)

• Devices to be used

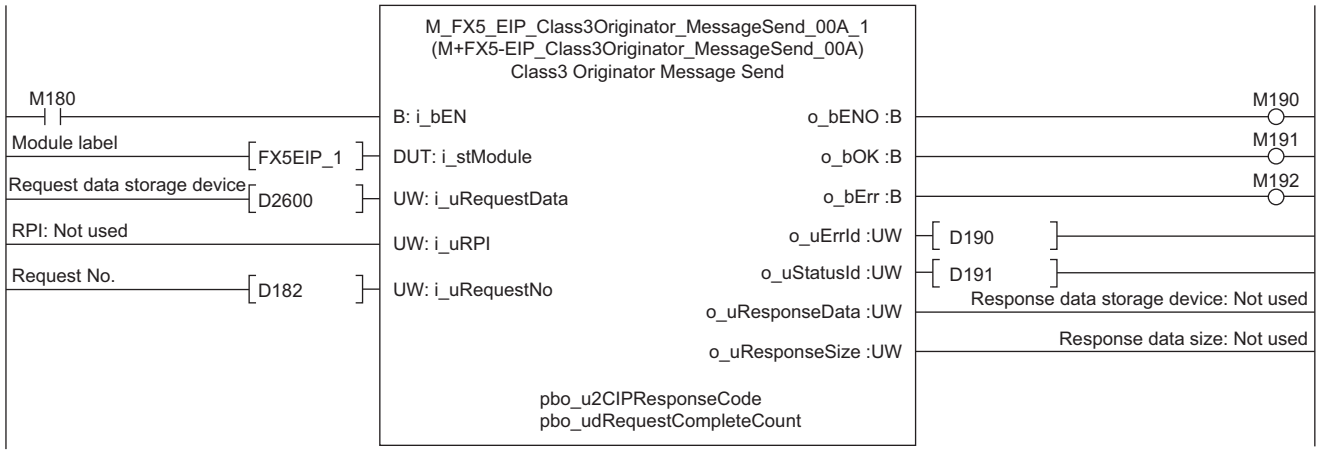
Device	Description	Set value
M180	Execution command	—
D2600	Request data storage device	K120
D182	Request No.	K9
M190	Execution status	—
M191	Normal completion	—
M192	Error completion	—
D190	Error code	—
D191	Error code of communication error	—

The input label is set by turning on M13.



Executes the FB by turning on M180, and sends request commands based on the parameter settings to the external device side.

Once the FB execution completes normally, Encapsulation Inactivity Timeout of the external device set for Connection No.9 is sent to the external device, then M191 turns on.



7.18 M+FX5ENET_MQTT_Connect (MQTT connection establishment)

M+FX5ENET_MQTT_Connect (MQTT connection establishment) is used for controlling the connection with an MQTT broker (server).

System configuration

Refer to the following.

☞ Page 16 System Configuration

Workflow

1. FB library registration

Register the FB library. For the operating procedures, refer to the following.

📖GX Works3 Operating Manual

2. Preliminary setting

Set the area of data to be sent. (☞ Page 343 Preliminary setting)

3. Parameter setting

Set the parameter. (☞ Page 87 Parameter setting)

4. Program creation

Create a program. (☞ Page 346 Program)

Preliminary setting

Set the data to be sent in the following areas.

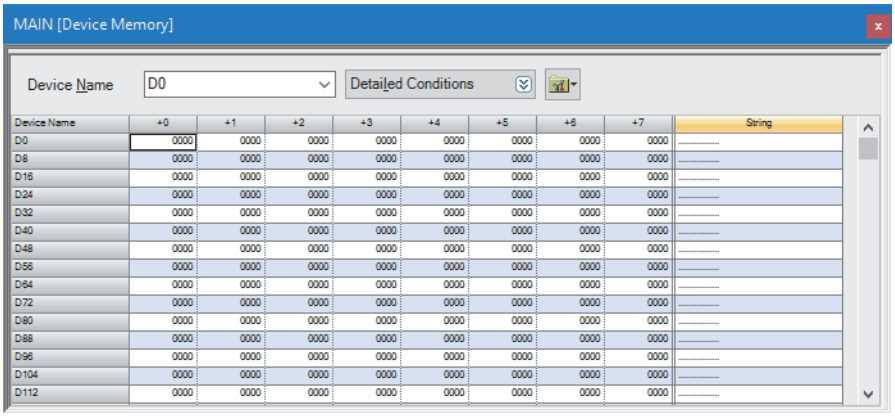
- Will topic name: R0 to R5
- Will message: R300 to R305

Operating procedure

1. Write the sample project into the CPU module and set the CPU module to RUN.

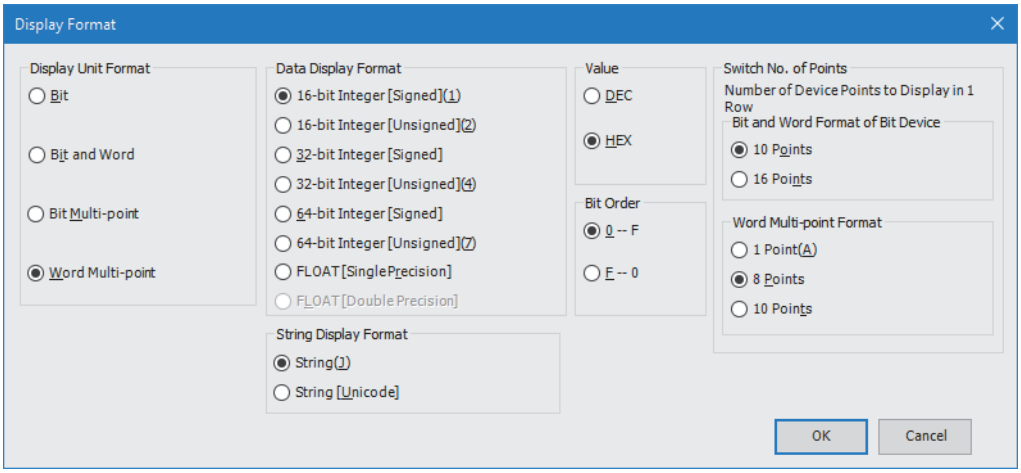
2. Open the device memory editor. Set the display format as follows.

Navigation window ⇨ [Device] ⇨ [Device Memory] ⇨ [MAIN (data name)]



3. Set the display format as follows.

[View] ⇨ [Display Format Detailed Setting]

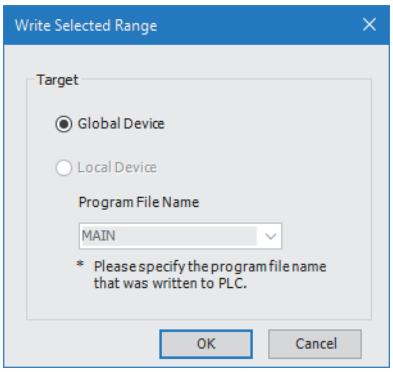


4. Input the following data into the table of the device memory editor.

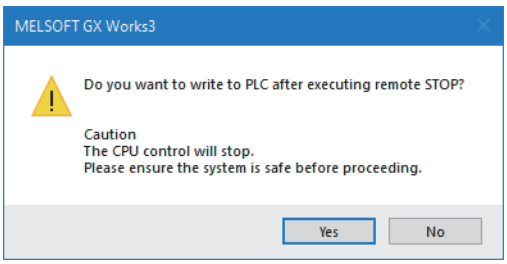
Item	Device name	Input data							
		+0	+1	+2	+3	+4	+5	+6	+7
Will topic name data	R0	6957	6C6C	6F54	6970	4163	0000	0000	0000
Will message data	R300	6957	6C6C	654D	7373	6761	4165	0000	0000
Subscribe topic name data	R600	7553	7362	7263	6269	5465	706F	6369	0041
Publish topic name data	R700	7550	6C62	7369	5468	706F	6369	0041	0000

5. Select "R0" (R0(+0)) to "R707" (R704(+3)) from the table of the device memory editor and write the data into the CPU module.

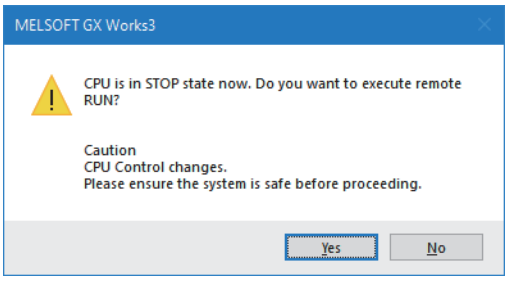
Select data ⇨ Right-click ⇨ [Online] ⇨ [Write Selected Range] ⇨ "Use Common File Register in All Programs" ⇨ [OK]



6. When the following window appears, click the [Yes] button.



7. Write the data into the CPU module. When the following windows appears, click the [Yes] button.



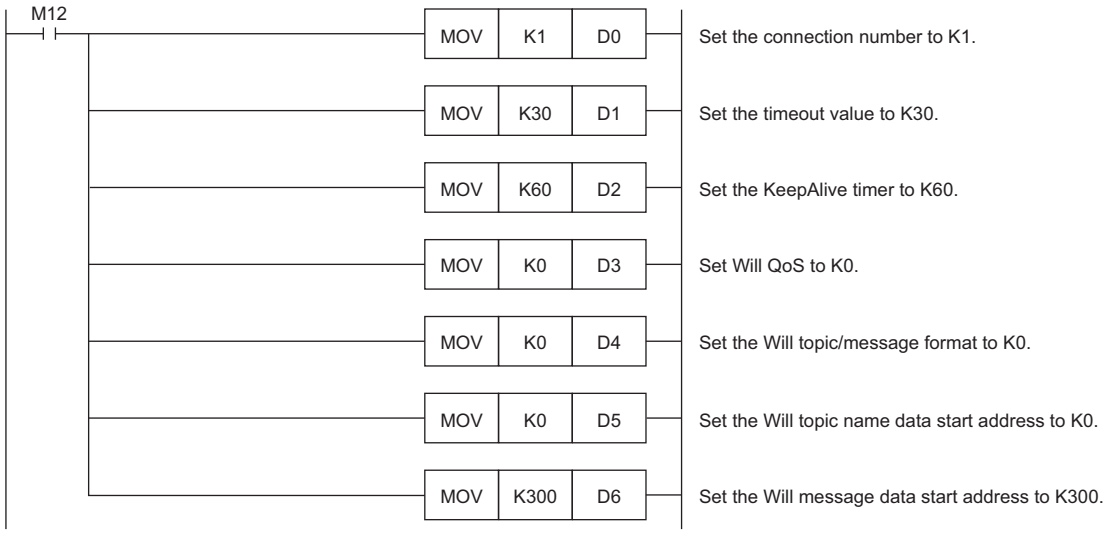
Parameter setting

Refer to the following.

☞ Page 87 Parameter setting

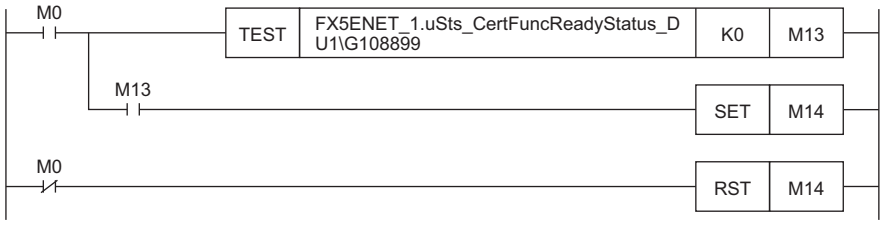
Program

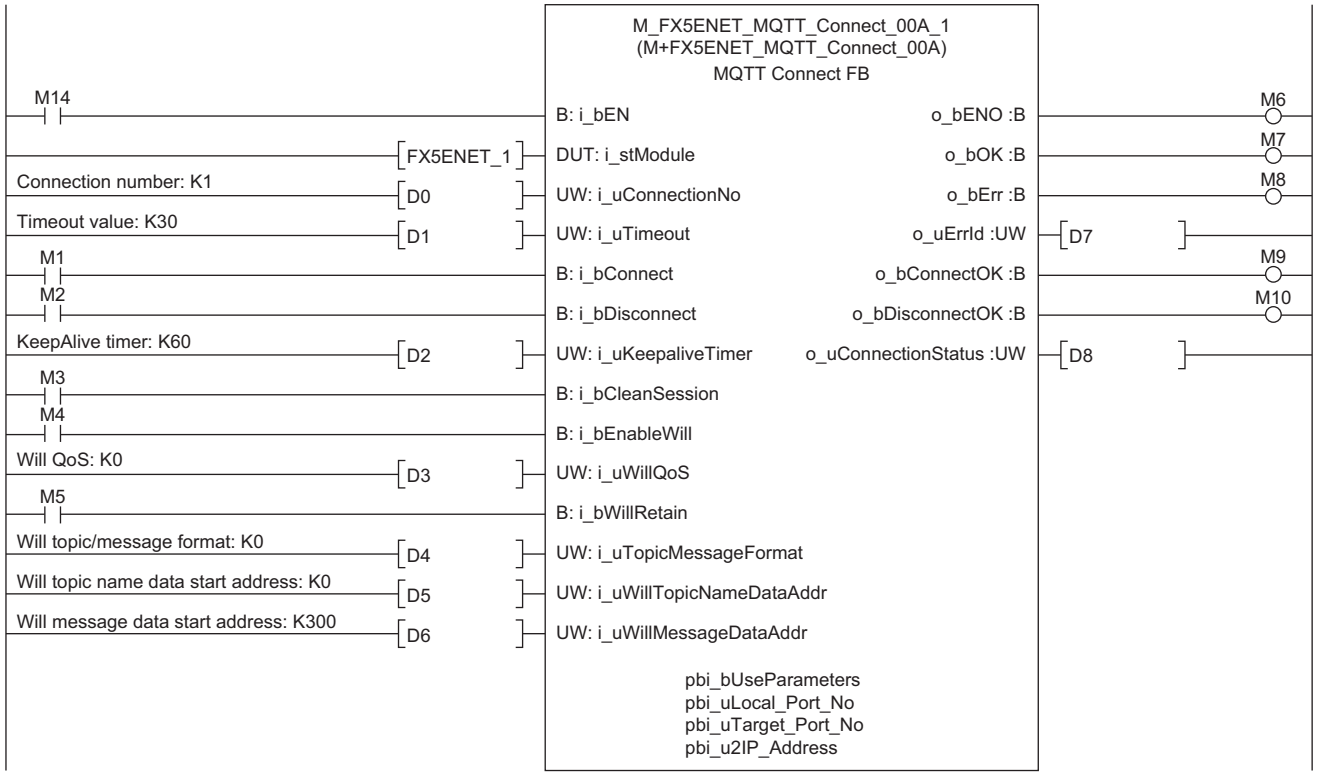
M12 turns on for setting the information used for M+ENET_MQTT_Connect (MQTT connection establishment).



After M4 (Enable Will) turns on, M0 turns on. When FX5ENET_1.uSts_CertFuncReadyStatus_D (Certificate function ready-to-enable state) turns on, M14 (Execution command) turns on. M1 (CONNECT instruction) subsequently turns on to establish the connection.

When the connection is successfully established, M9 (Establishment completion) turns on.





7.19 M+FX5ENET_MQTT_Subscribe (Sending of Subscribe command)

M+FX5ENET_MQTT_Subscribe (Sending of Subscribe command) is used for sending a SUBSCRIBE/UNSUBSCRIBE command to an MQTT broker (server).

System configuration

Refer to the following.

☞ Page 16 System Configuration

Workflow

1. FB library registration

Register the FB library. For the operating procedures, refer to the following.

📖GX Works3 Operating Manual

2. Preliminary setting

Set the area of data to be sent. (☞ Page 347 Preliminary setting)

3. Parameter setting

Set the parameter. (☞ Page 87 Parameter setting)

4. Program creation

Create a program. (☞ Page 348 Program)

Preliminary setting

Set the data to be sent in the following areas.

- Subscribe topic name: R600 to R607

Operating procedure

Refer to the following.

☞ Page 343 Preliminary setting

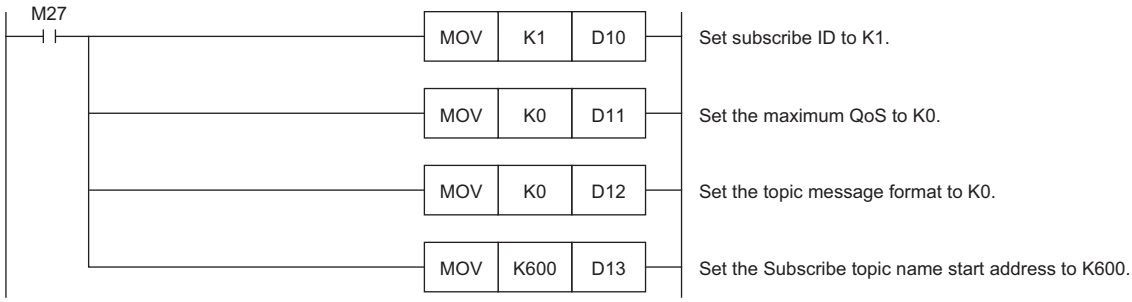
Parameter setting

Refer to the following.

☞ Page 87 Parameter setting

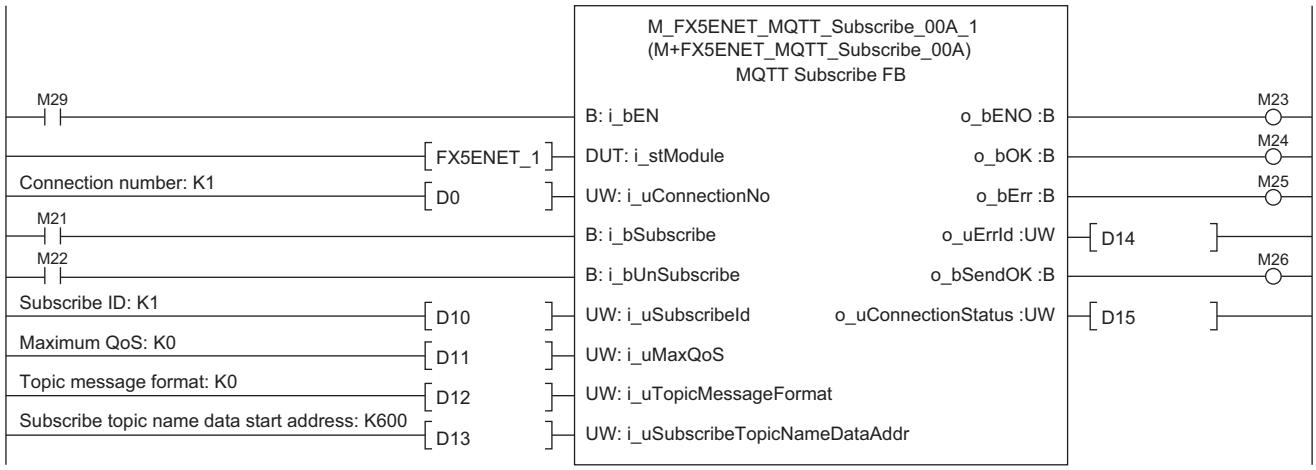
Program

M27 turns on for setting the information used for M+ENET_MQTT_Subscribe (Sending of Subscribe command).



M29 (Execution command) turns on. After M23 (Execution status) turns on, M21 (SUBSCRIBE instruction) turns on for sending the SCRIBE command.

After the Subscribe is successfully sent, M26 (Send completion) turns on.



7.20 M+FX5ENET_MQTT_Receive (Receiving of MQTT data)

M+FX5ENET_MQTT_Receive (Receiving of MQTT data) is used for reading a message received from an MQTT broker (server).

System configuration

Refer to the following.

☞ Page 16 System Configuration

Workflow

1. FB library registration

Register the FB library. For the operating procedures, refer to the following.

📖GX Works3 Operating Manual

📖MELSEC iQ-F Character String Operation Function Block Library Reference

2. Parameter setting

Set the parameter. (☞ Page 87 Parameter setting)

3. Create a program.

Create a program. (☞ Page 350 Program)

Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

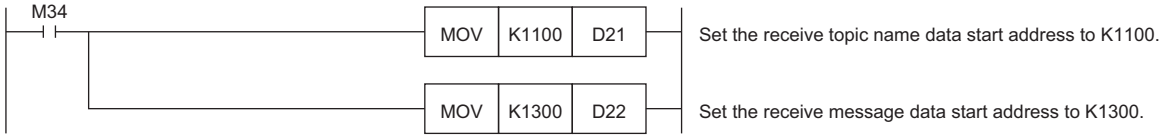
Refer to the following.

☞ Page 87 Parameter setting

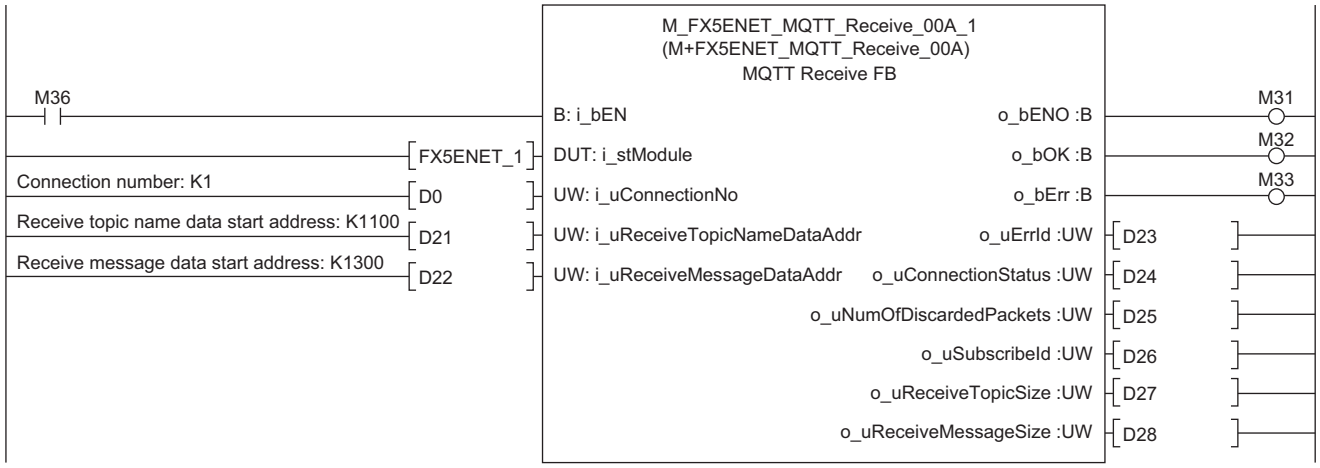
Program

■Receiving of message data

M34 turns on for setting the information used for M+ENET_MQTT_Receive (Receiving of MQTT data).

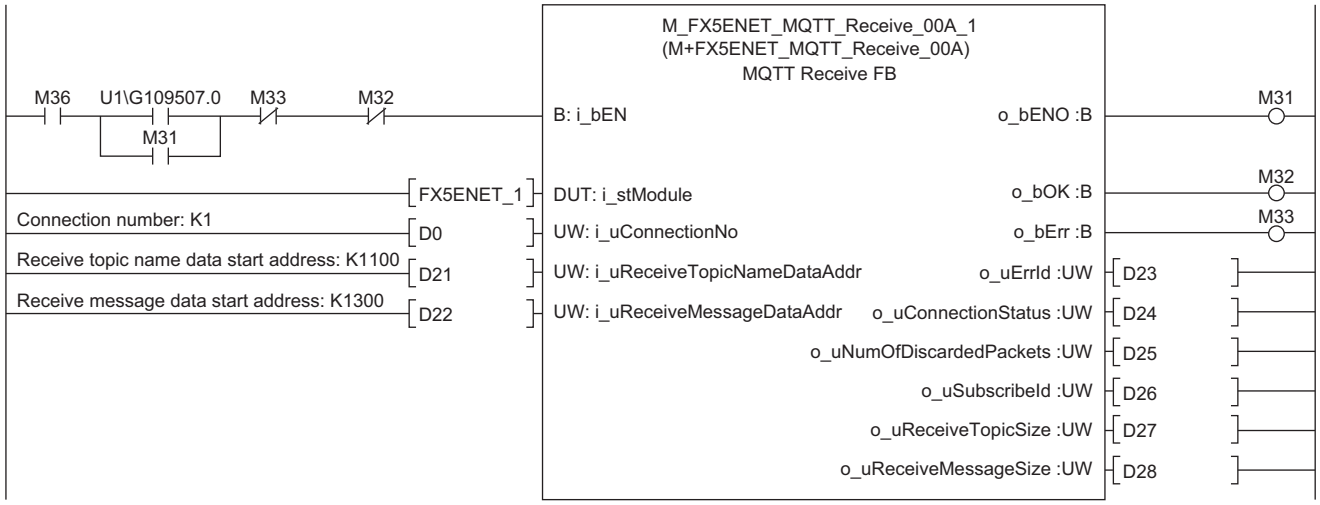


M36 (Execution command) turns on for storing the receive data into the specified file register.
After the data is successfully received, M32 (Normal completion) turns on. The receive data is stored in the file register set with i_uReceiveTopicNameDataAddr (Receive topic name data start address) and i_uReceiveMessageDataAddr (Receive message data start address).



• When the FX5-ENET firmware version is 1.210 or later

Un\G109507.0 (MQTT receive notification message received or not) can be used to check whether a message is received from the MQTT (broker) server. After M36 (Execution command) turns on, when Un\G109507.0 (MQTT receive notification message received or not) is on, the receive data can be stored in the specified file register until M32 (Normal completion) or M33 (Error completion) turns on.



After the data is successfully received, M32 (Normal completion) turns on. The receive data is stored in the file register set with i_uReceiveTopicNameDataAddr (Receive topic name data start address) and i_uReceiveMessageDataAddr (Receive message data start address).

■Acquisition of only the required strings from receive data

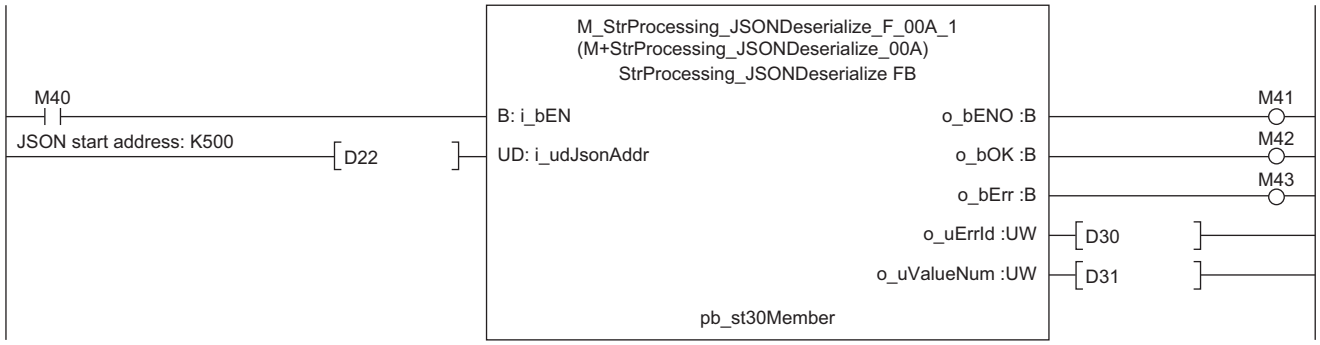
• Settings for required member information

M40 (Execution command) turns on for setting the member information to be acquired.

```
M40
 1  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[0].uType := K4; //Set K4 (numerical value) to the Value type.
 2  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[0].s32Key := 'id1'; //Set "id1" to the Key name.
 3  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[0].uDepth := K1; //Set K1 to the depth of layer.
 4  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[1].uType := K3; //Set K3 (character string) to the Value type.
 5  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[1].s32Key := 'date'; //Set "date" to the Key name.
 6  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[1].uDepth := K1; //Set K1 to the depth of layer.
 7  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[2].uType := K1; //Set K1 (object) to the Value type.
 8  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[2].s32Key := 'detail'; //Set "detail" to the Key name.
 9  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[2].uDepth := K1; //Set K1 to the depth of layer.
10  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[3].uType := K2; //Set K2 (array) to the Value type.
11  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[3].s32Key := 'size'; //Set "size" to the Key name.
12  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[3].uDepth := K2; //Set K2 to the depth of layer.
13  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[4].uType := K3; //Set K3 (character string) to the Value type.
14  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[4].s32Key := 'color_No.'; //Set "color_No." to the Key name.
15  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[4].uDepth := K2; //Set K2 to the depth of layer.
16  M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[5].uType := K0; //Set K0 (end of the member structure array) to the Value type.
```

• Acquisition of JSON string

When M40 (Execution command) turns on, the function block acquires the Value strings that exactly match the values of uType (Value type), s32Key (Key name), and uDepth (depth of layer) in the set member list (pb_st30Member) from JSON strings stored at the JSON start address, and it stores the values into the s64Value (Value) values in the member list (pb_st30Member).



7.21 M+FX5ENET_MQTT_PublishSend (Sending of MQTT data)

M+FX5ENET_MQTT_PublishSend (Sending of MQTT data) is used for sending the message to the MQTT broker (server).

System configuration

Refer to the following.

☞ Page 16 System Configuration

Workflow

1. FB library registration

Register the FB library. For the operating procedures, refer to the following.

📖GX Works3 Operating Manual

📖MELSEC iQ-F Character String Operation Function Block Library Reference

2. Preliminary setting

Set the area of data to be sent. (☞ Page 352 Preliminary setting)

3. Parameter setting

Set the parameter. (☞ Page 87 Parameter setting)

4. Program creation

Create a program. (☞ Page 353 Program)

Preliminary setting

Set the data to be sent in the following areas.

- Publish topic name: R700 to R707
- Publish message: R1000 to R1095

Operating procedure

Refer to the following.

☞ Page 343 Preliminary setting

Parameter setting

Refer to the following.

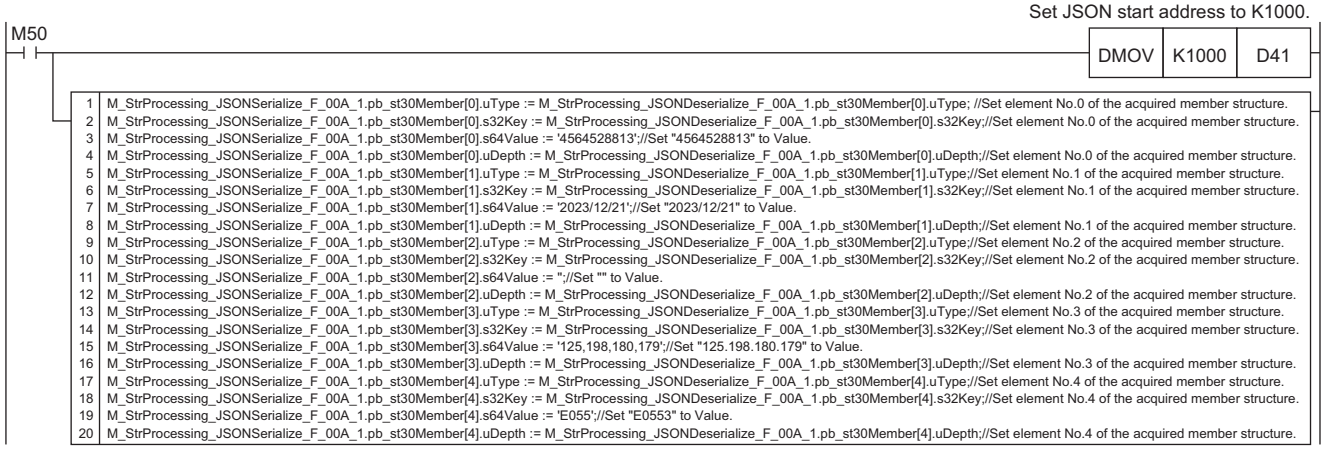
☞ Page 87 Parameter setting

Program

■Send data creation

• Settings for data to be sent

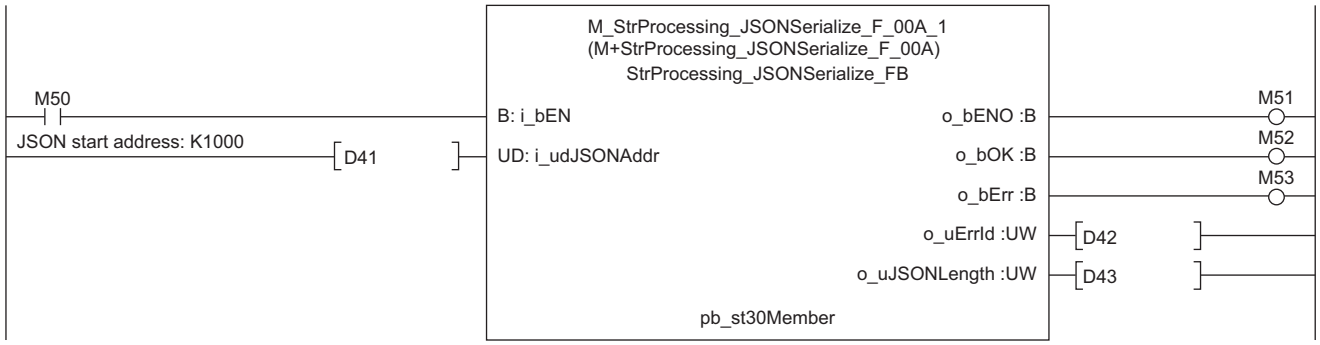
M50 (Execution command) turns on for setting the data to be sent.




```
1  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[0].uType := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[0].uType; //Set element No.0 of the acquired member structure.
2  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[0].s32Key := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[0].s32Key;//Set element No.0 of the acquired member structure.
3  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[0].s64Value := '4564528813';//Set "4564528813" to Value.
4  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[0].uDepth := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[0].uDepth;//Set element No.0 of the acquired member structure.
5  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[1].uType := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[1].uType;//Set element No.1 of the acquired member structure.
6  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[1].s32Key := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[1].s32Key;//Set element No.1 of the acquired member structure.
7  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[1].s64Value := '2023/12/21';//Set "2023/12/21" to Value.
8  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[1].uDepth := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[1].uDepth;//Set element No.1 of the acquired member structure.
9  M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[2].uType := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[2].uType;//Set element No.2 of the acquired member structure.
10 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[2].s32Key := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[2].s32Key;//Set element No.2 of the acquired member structure.
11 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[2].s64Value := '';//Set "" to Value.
12 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[2].uDepth := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[2].uDepth;//Set element No.2 of the acquired member structure.
13 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[3].uType := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[3].uType;//Set element No.3 of the acquired member structure.
14 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[3].s32Key := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[3].s32Key;//Set element No.3 of the acquired member structure.
15 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[3].s64Value := '125,198,180,179';//Set "125.198.180.179" to Value.
16 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[3].uDepth := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[3].uDepth;//Set element No.3 of the acquired member structure.
17 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[4].uType := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[4].uType;//Set element No.4 of the acquired member structure.
18 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[4].s32Key := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[4].s32Key;//Set element No.4 of the acquired member structure.
19 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[4].s64Value := 'E055';//Set "E0553" to Value.
20 M_StrProcessing_JSONSerialize_F_00A_1.pb_st30Member[4].uDepth := M_StrProcessing_JSONDeserialize_F_00A_1.pb_st30Member[4].uDepth;//Set element No.4 of the acquired member structure.
```

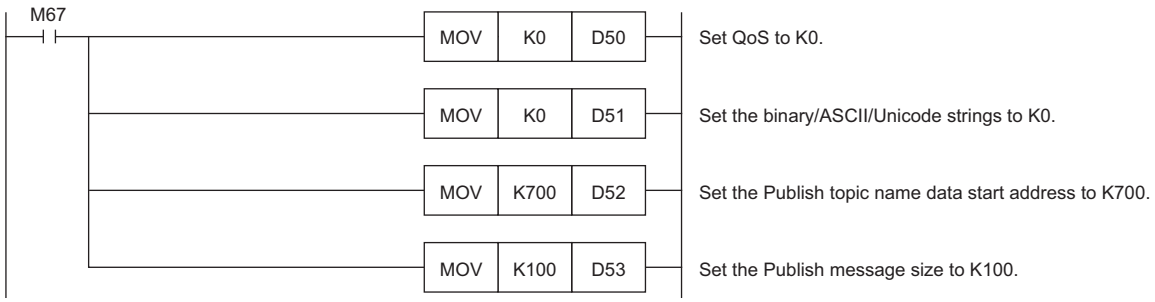
• JSON string creation

When M50 (Execution command) turns on, the function block creates a JSON string in accordance with the information of uType (Value type), s32Key (Key name), s64Value (value of Value), and uDepth (depth of layer) in the set member list (pb_st30Member) and it outputs the string to the file register at the address specified with the start address of the JSON string storage destination.

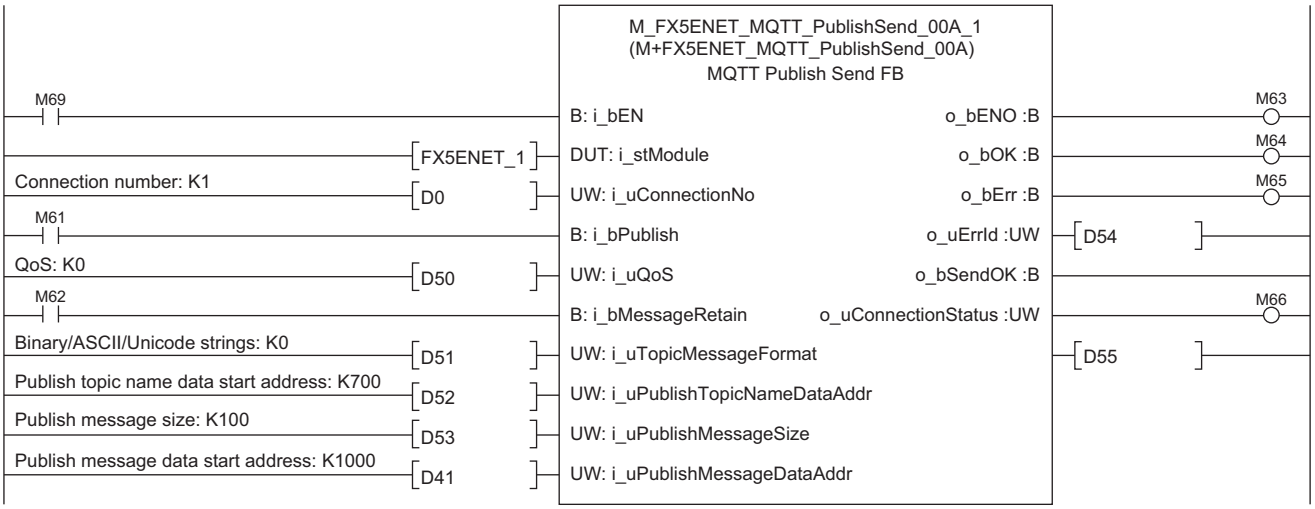


■Sending of message data

M67 turns on for setting the information used for M+ENET_MQTT_PublishSend (Sending of MQTT data).



M69 (Execution command) turns on. After M63 (Execution status) turns on, M61 (PUBLISH instruction (Rise detection)) turns on for sending a message.



7.22 M+FX5ENET_Mail_Send (Sending of E-mail)

M+FX5ENET_Mail_Send (Sending of E-mail) is used for establishing a TLS/TCP session with an SMTP server. Then, it sends E-mail data.

Overview

This FB establishes a TLS/TCP session with an SMTP server. Then, it sends E-mail data.

System configuration

Refer to the following.

☞ Page 16 System Configuration

Workflow

1. Settings for E-mail

Configure settings for E-mail. For the operating procedures, refer to the following.

📖MELSEC iQ-F FX5 Ethernet Module User's Manual

2. Preliminary setting

Set the area of data to be sent. (☞ Page 355 Preliminary setting)

3. Program creation

Create a program. (☞ Page 358 Program)

Preliminary setting

Set the data to be sent in the following areas.

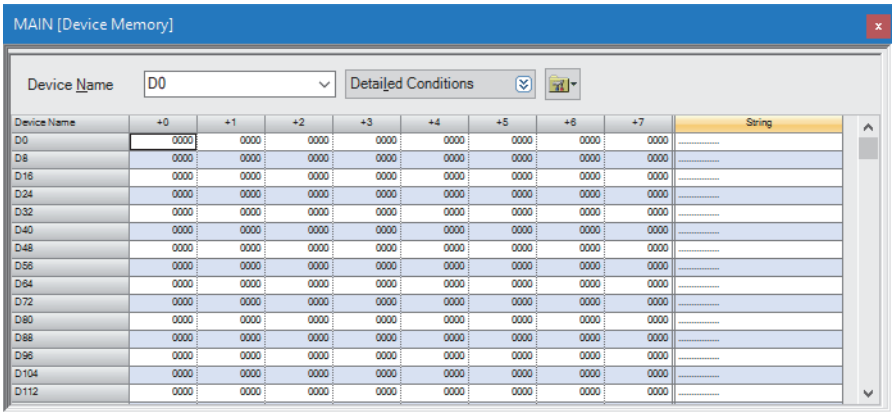
- Send destination address: R0 to R7
- Subject data: R130 to R135
- Message body data: R250 to R254
- Attachment data: R300 to R305

Operating procedure

1. Write the sample project into the CPU module and set the CPU module to RUN.

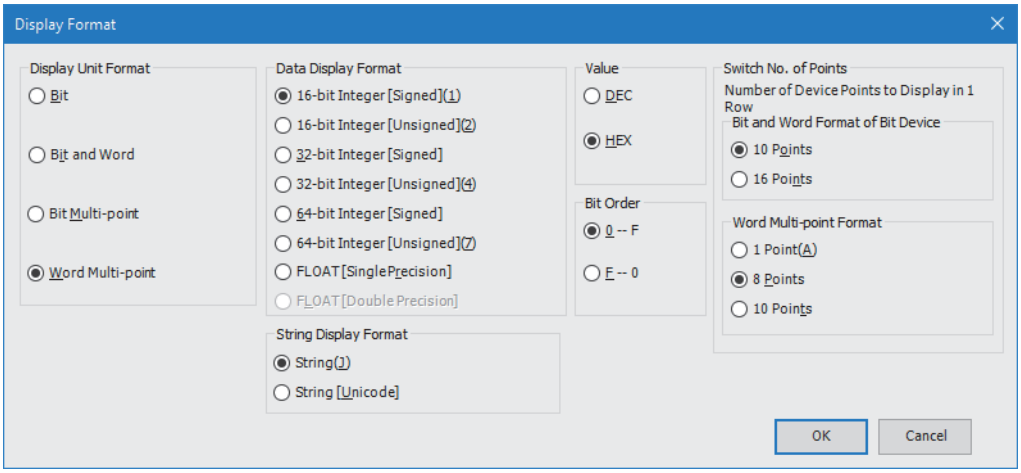
2. Open the device memory editor. Set the display format as follows.

Navigation window ⇨ [Device] ⇨ [Device Memory] ⇨ [MAIN (data name)]



3. Set the display format as follows.

[View] ⇨ [Display Format Detailed Setting]

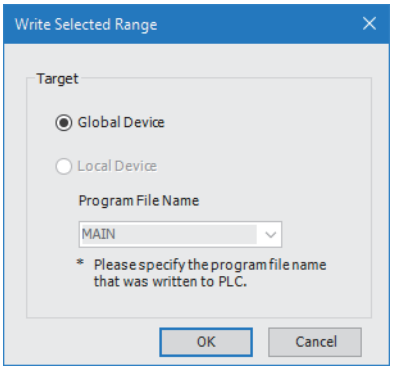


4. Input the following data into the table of the device memory editor.

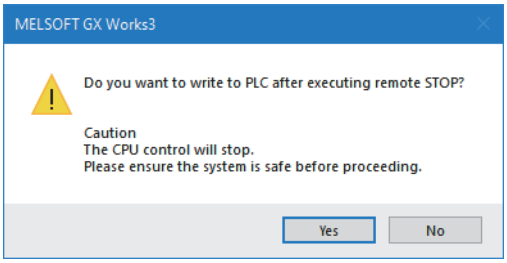
Item	Device name	Input data							
		+0	+1	+2	+3	+4	+5	+6	+7
Send destination address	R0	6564	4066	7856	6D61	6C70	2E65	6F63	006D
Subject data	R130	7533	6A62	6365	4474	7461	4161	0000	0000
Message body data	R250	6F42	7964	6144	6174	0041	0000	0000	0000
Attachment data	R300	7441	6174	6863	6144	6174	0041	0000	0000

5. Select "R0" (R0(+0)) to "R307" (R304(+3)) from the table of the device memory editor and write the data into the CPU module.

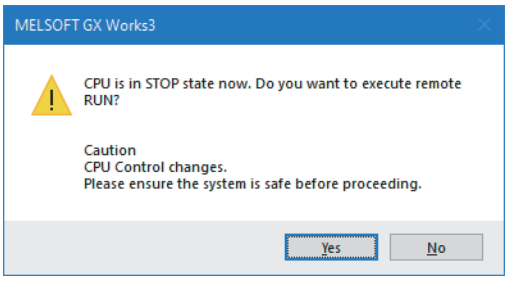
Select data ⇨ Right-click ⇨ [Online] ⇨ [Write Selected Range] ⇨ "Use Common File Register in All Programs" ⇨ [OK]



6. When the following window appears, click the [Yes] button.



7. Write the data into the CPU module. When the following windows appears, click the [Yes] button.



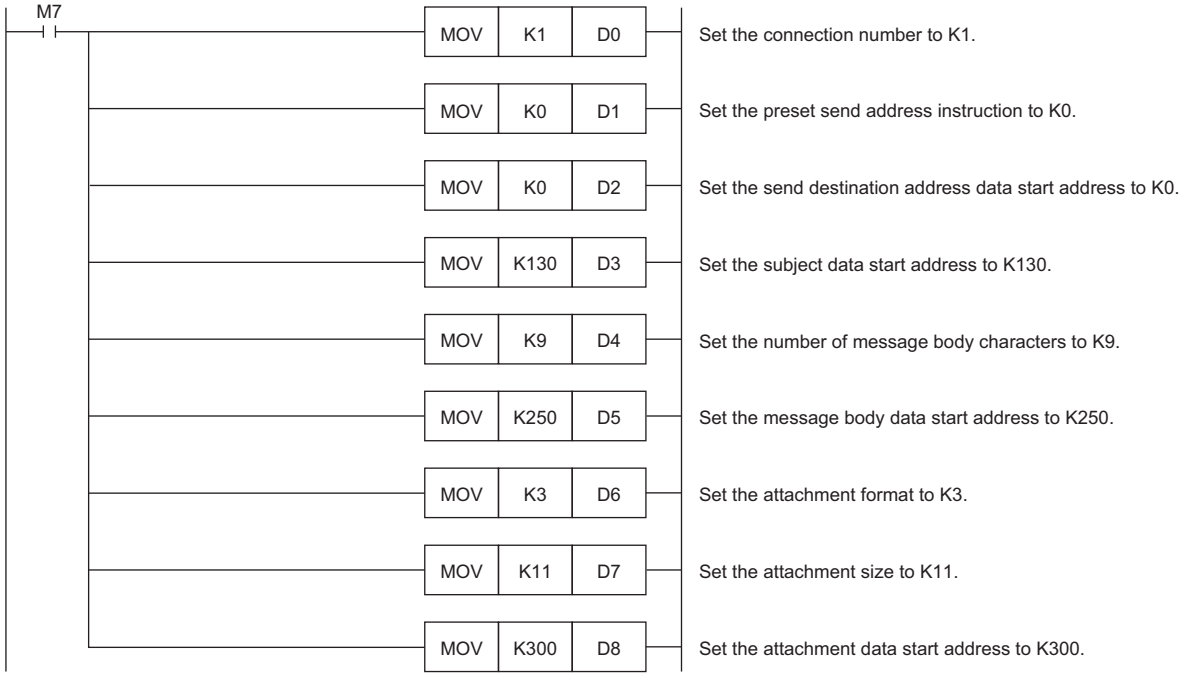
Parameter setting

Refer to the following.

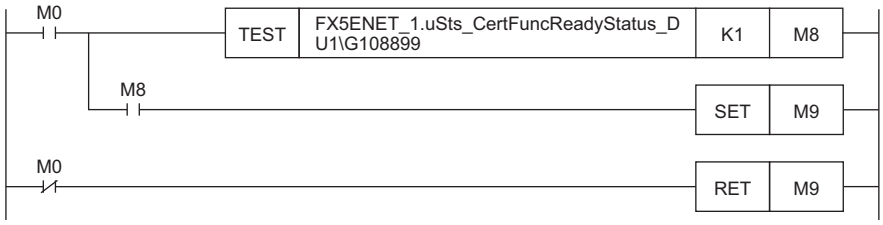
☞ Page 109 Parameter setting

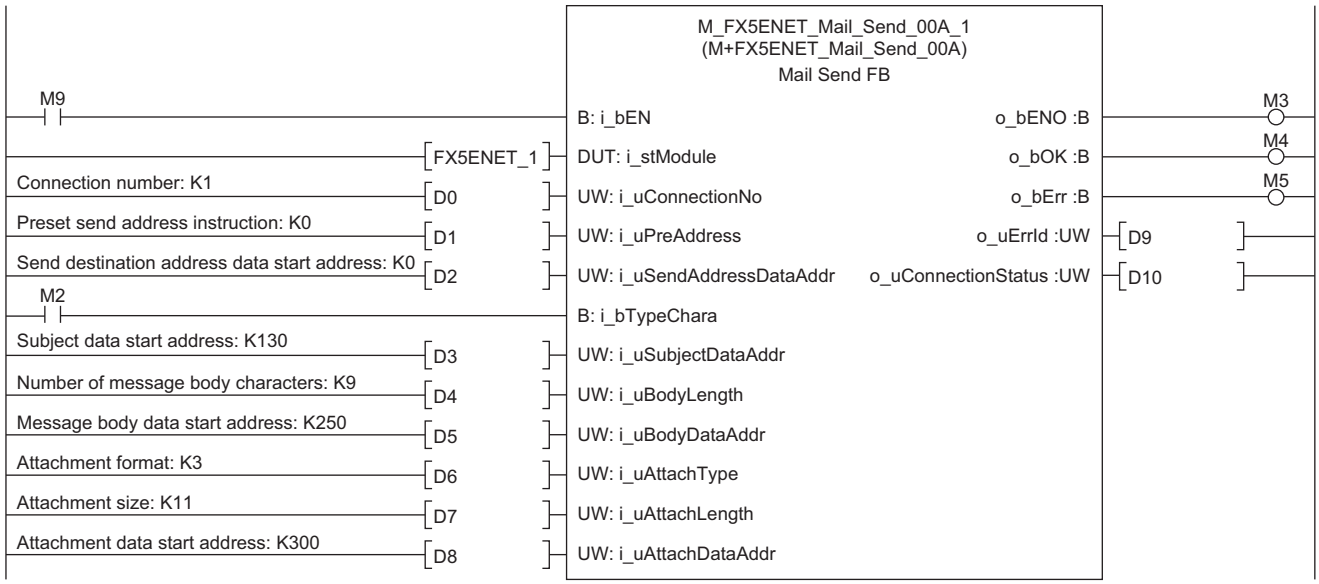
Program

M7 turns on for setting the information used for M+ENET_Mail_Send (Sending of E-mail).



After M2 (ASCII/UTF-16 string specification) turns on, M0 turns on. When FX5ENET_1.uSts_CertFuncReadyStatus_D (Certificate function ready-to-enable state) turns on, M9 (Execution command) turns on to send an E-mail. After the E-mail is successfully sent, M4 (Normal completion) turns on.





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MEMO

REVISIONS

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