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-CCLGN-MS
- FX5-CCLIEF

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.

MEMO

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RELEVANT MANUALS

Manual name <manual number>	Description
MELSEC iQ-F FX5S User's Manual (Hardware) <SH-082452ENG>	Describes the details of hardware of the 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 (Ethernet Communication) <JY997D56201>	Describes the Ethernet communication function of the CPU module built-in and the Ethernet module.
MELSEC iQ-F FX5-ENET User's Manual <SH-082026ENG>	Describes the functions of the Ethernet module.
MELSEC iQ-F FX5 User's Manual (SLMP) <JY997D56001>	Explains methods for the device that is communicating with the CPU module by SLMP to read and write the data of the CPU module.
MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) <SH-082215ENG>	Describes CC-Link IE TSN module.
MELSEC iQ-F FX5 User's Manual (CC-Link IE) <JY997D64201>	Describes CC-Link IE field network module.
GX Works3 Operating Manual <SH-081215ENG>	System configuration, parameter settings, and online operations of GX Works3.

TERMS

Unless otherwise specified, this manual uses the following terms.

Terms	Description
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance
Device station	A station (local station, remote station) other than the master station
Socket communication	Data communications with the connected devices via Ethernet by TCP or UDP using dedicated instructions
Device code	Device name represented in ASCII code or binary code for the device to be accessed
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.
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.
Local station	A station that performs cyclic transmission and transient transmission with the master station and local stations

GENERIC TERMS AND ABBREVIATIONS

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

Generic terms and abbreviations	Description
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 FX5UJ CPU module, FX5U CPU module, and FX5UC CPU module
FX5S CPU module	A generic term for FX5S-30MR/ES, FX5S-40MR/ES, FX5S-60MR/ES, FX5S-80MR/ES*1, FX5S-30MT/ES,FX5S-40MT/ES, FX5S-60MT/ES, FX5S-80MT/ES*1, FX5S-30MT/ESS, FX5S-40MT/ESS, FX5S-60MT/ESS, and FX5S-80MT/ESS*1
FX5U CPU module	A generic term for 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 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 FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, and FX5UJ-60MT/ESS
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) to use the MELSEC iQ-F FX5 Ethernet, FX5 EtherNet/IP, CC-Link IE TSN and CC-Link IE Field Network module.

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 are the model names of the module FBs by module.

• FX5S, FX5U, FX5UC, and FX5UJ

FX5UCPU

• FX5-ENET

FX5ENET

• FX5-ENET/IP

FX5ENETIP

FX5 Ethernet-equipped module FB

○: 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 (SLMP compatible device reading)	Reads data from the SLMP-compatible device by specifying IP address.	—
M+FX5UCPU-EN_SLMP_DeviceWrite_IP (SLMP compatible device writing)	Writes data to the SLMP-compatible device by specifying IP address.	—
M+FX5UCPU-EN_SLMP_DeviceRead_Active (SLMP compatible device reading through active connection)	Perform the open/close processing and reading device data of SLMP compatible devices by Active connection.	○
M+FX5UCPUEN_SLMP_DeviceWrite_Active (SLMP compatible device writing through active connection)	Perform the open/close processing and writing device data of SLMP compatible devices by Active connection.	○
M+FX5UCPUEN_SLMP_DeviceCodeConversion (Device code reading of SLMP communication FB)	Calculate the value to be input to the device code for SLMP communication.	—
M+FX5UCPU-EN_ModbusTcp_ClientRead (Reading by MODBUS/TCP client)	Perform the open/close processing and reading by MODBUS/TCP client in socket communication	○
M+FX5UCPU-EN_ModbusTcp_ClientWrite (Writing by MODBUS/TCP client)	Perform the open/close processing and writing by MODBUS/TCP client in socket communication	○
M+FX5ENET_MQTT_Connect (MQTT connection establishment)	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+FX5ENET_MQTT_PublishSend (Sending of MQTT data)	Sends a message to an MQTT broker (server).	○
M+FX5ENET_MQTT_Receive (Receiving of MQTT data)	Reads a message received from an MQTT broker (server).	○
M+FX5ENET_MQTT_Subscribe (Sending of Subscribe command)	Sends a SUBSCRIBE/UNSUBSCRIBE command to an MQTT broker (server).	○
M+FX5ENET_Mail_Send (Sending of E-mail)	Establishes a TLS/TCP session with an SMTP server. Then, it sends E-mail data.	○

FX5 EtherNet/IP-equipped module FB

○: Required, —: Not required

Name	Description	Necessity of parameter setting
M+FX5ENETIP_Class1GetInputData (Class 1 communication input data acquisition)	Acquires the input data of the designated connection by Class1 communication.	○
M+FX5ENETIP_Class1SetOutputData (Class 1 communication output data setting)	Updates the output data of the designated connection by Class1 communication.	○

CC-Link IE TSN module FB

○: Required, —: Not required

Name	Description	Necessity of parameter setting
M+FX5CCLGNMS_DeviceRead (Another station device reading)	Reads data by specifying a device in the programmable controller of another station.	○
M+FX5CCLGNMS_DeviceWrite (Another station device writing)	Writes data by specifying a device in the programmable controller of another station.	○
M+FX5CCLGNMS_Send (Another station data sending)	Sends data to the programmable controller of another station.	○
M+FX5CCLGNMS_Recv (Another station data receiving)	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.	○

CC-Link IE Field Network module FB

○: Required, —: Not required

Name	Description	Necessity of parameter setting
M+FX5CCLIEF_DeviceRead (Another station device reading)	Reads data from a specified device in the programmable controller of another station.	○
M+FX5CCLIEF_DeviceWrite (Another station device writing)	Writes data to a specified device in the programmable controller of another station.	○
M+FX5CCLIEF_Send (Another station device sending)	Sends data to the programmable controller of another station.	○
M+FX5CCLIEF_Recv (Another station device receiving)	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.	○

1.2 How to Obtain

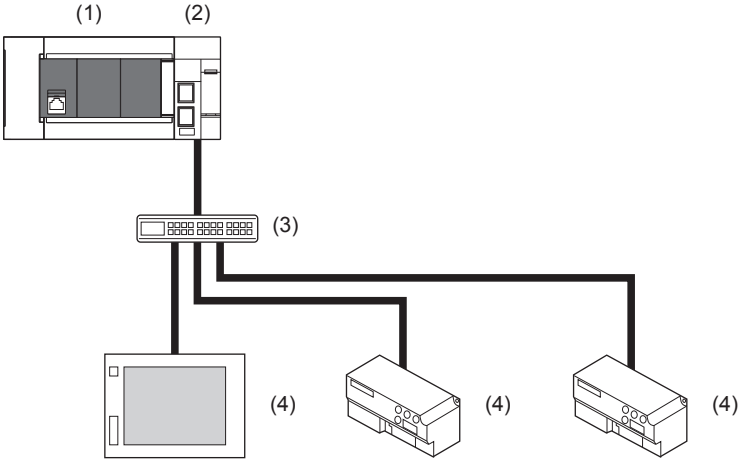
The FX5 Ethernet-equipped module FB, FX5 EtherNet/IP-equipped module FB, CC-Link IE TSN module FB, CC-Link IE Field Network module FB described in this reference manual are incorporated into GX Works3[*1]. For using the module FBs, refer to the 📖GX Works3 Operating Manual.

*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.

FX5 Ethernet-equipped module

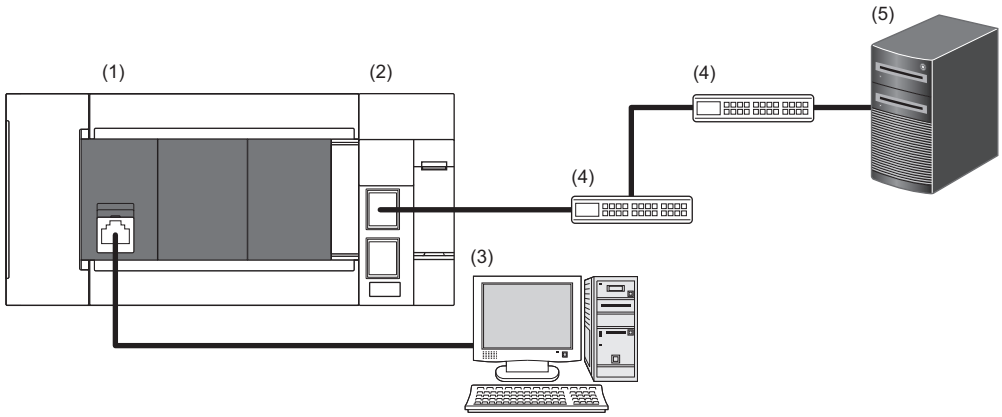


(1) FX5 CPU module
(2) FX5-ENET (master station)
(3) Hub
(4) External device (slave station)

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

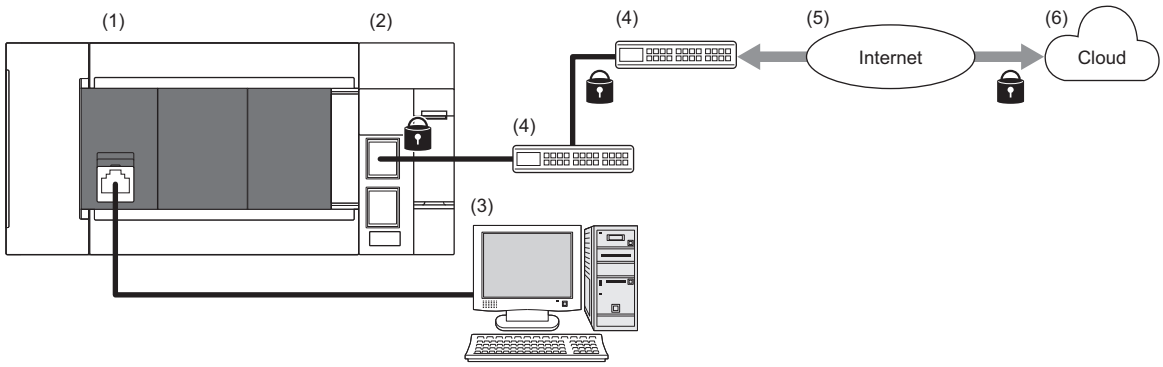
FX5 Ethernet-equipped module (MQTT communication function)

■For TCP connection



(1) FX5UJ CPU module, FX5U CPU module, 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)

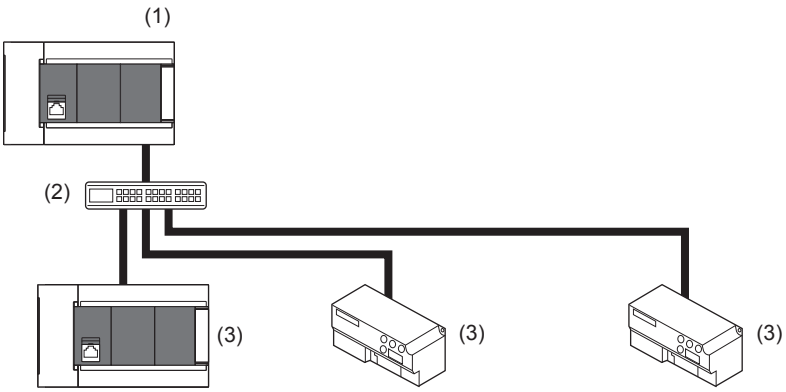
■For TLS connection



(1) FX5UJ CPU module, FX5U CPU module, 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.

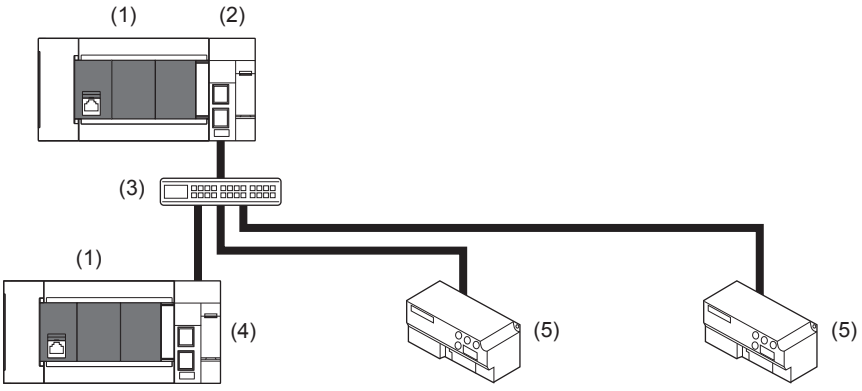
MODBUS/TCP



(1) FX5 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.

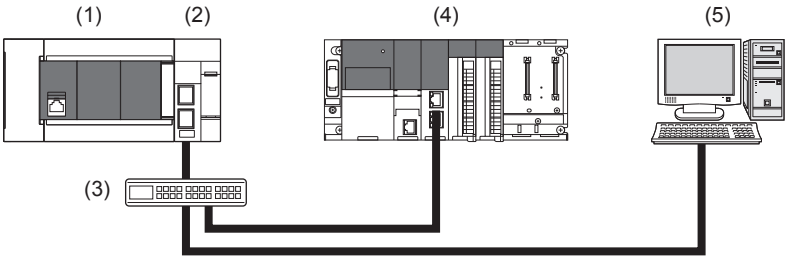
FX5 EtherNet/IP-equipped module



(1) FX5 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.

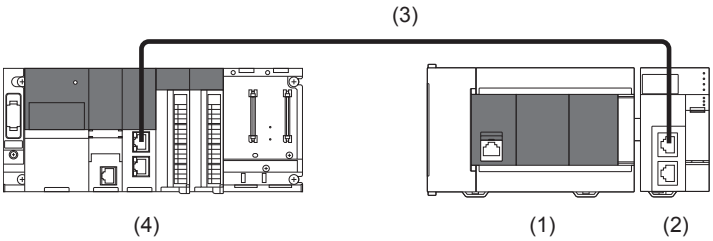
CC-Link IE TSN



(1) 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) FX5 CPU module
(2) CC-Link IE Field Network module (device station)
(3) Ethernet cable
(4) CC-Link IE Field Network module (Master)

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

2 FX5 Ethernet-EQUIPPED MODULE FB

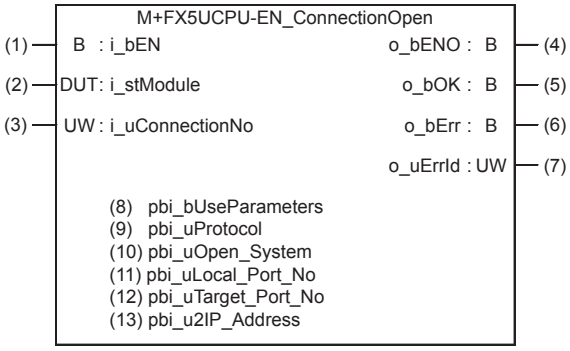
2.1 M+model_ConnectionOpen (Connection establishment)

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

Overview

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)
(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 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 device has been read out 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	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 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. 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 ■FX5 CPU module 0.0.0.1 to 223.255.255.254*3 ■FX5-ENET, FX5-ENET/IP 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

■CPU module

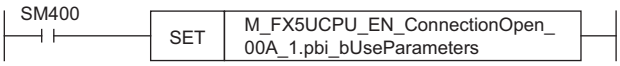
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

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

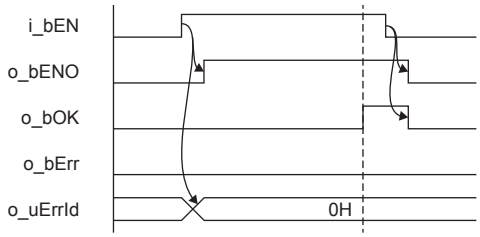
Processing

- 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). Refer to ☞ Page 21 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 20 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).

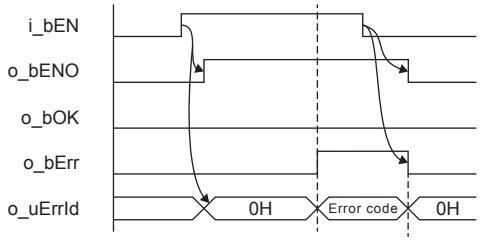


Timing chart of I/O signals

■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 the required system operation.
- This FB uses the following instructions.
  ■FX5 CPU module
  SP.SOCOPEN instruction
  ■FX5-ENET, FX5-ENET/IP
  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. If this happens, turn i_bEN (Execute command) from off to 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.
- 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.

- 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 the detailed setting procedure, refer to 📖MELSEC iQ-F FX5 User's Manual (Ethernet Communication), 📖MELSEC iQ-F FX5-ENET User's Manual, or 📖MELSEC iQ-F FX5-ENET/IP User's Manual.

Performance value

SP.SOCOPEN instruction

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

GP.OPEN instruction

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

*1 When the program capacity is set to 128 K 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 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 (Ethernet Communication) ■FX5-ENET Refer to the MELSEC iQ-F FX5-ENET User's Manual ■FX5-ENET/IP Refer to the MELSEC iQ-F FX5-ENET/IP User's Manual

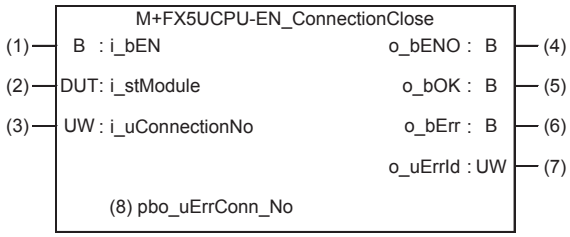
2.2 M+model_ConnectionClose (Disconnection)

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

Overview

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)
(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 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 device has been read out 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	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

■CPU module

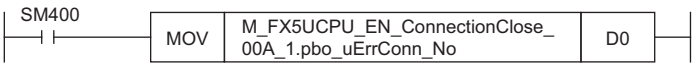
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

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

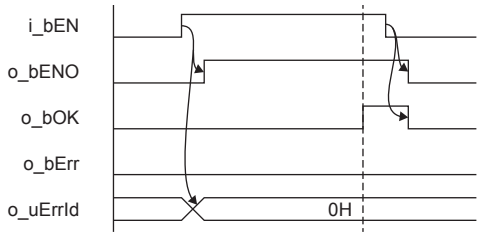
Processing

- 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 20 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate a public label as "FB instance"."public label". The following program is designed to output an error connection No. (M_FX5UCPU_EN_ConnectionClose_00A_1.pbo_uErrConn_No) to the device D0.

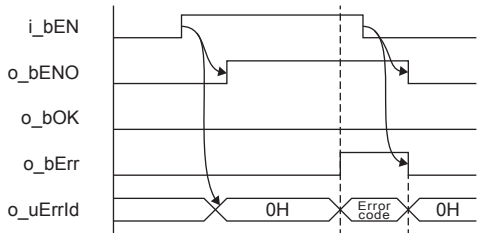


Timing chart of I/O signals

■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 the required system operation.
- This FB uses the following instructions.
  ■FX5 CPU module
  SP.SOCCLOSE instruction
  ■FX5-ENET, FX5-ENET/IP
  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. If this happens, turn i_bEN (Execute command) from off to 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 20 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	1.99 ms	0.722 ms	4 scan
	When using Active connection	4.74 ms	0.714 ms	10 scan
FX5UJ	When using UDP connection	1.99 ms	0.722 ms	4 scan
	When using Active connection	4.74 ms	0.714 ms	10 scan
FX5U, FX5UC*1*2	When using UDP connection	1.99 ms	0.722 ms	4 scan
	When using Active connection	4.74 ms	0.714 ms	10 scan

GP.CLOSE instruction

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

*1 When the program capacity is set to 128 K 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 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 (Ethernet Communication) ■FX5-ENET Refer to the MELSEC iQ-F FX5-ENET User's Manual ■FX5-ENET/IP Refer to the MELSEC iQ-F FX5-ENET/IP User's Manual

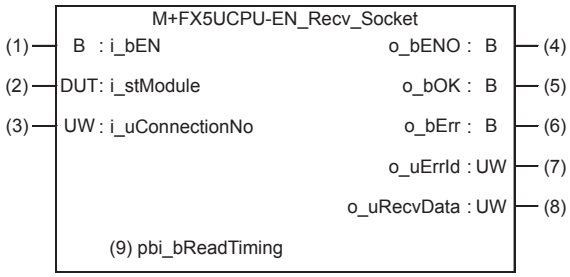
2.3 M+model_Recv_Socket (Receiving of data)

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

Overview

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)
(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 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.
(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. b15 b8 b7 b0 1st word: Received data length (unit: bytes) 2nd word: Received data 2 | Received data 1 ⋮ nth word: Received data 2n-2 | Received data 2n-3 • 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

■CPU module

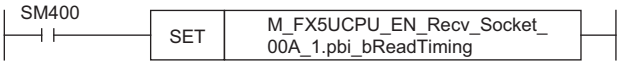
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

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

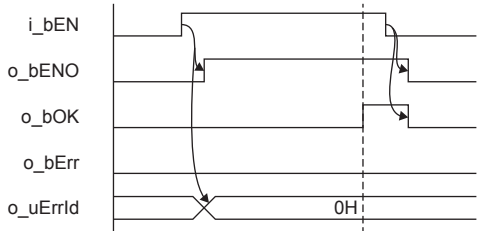
Processing

- 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 receiving, o_bErr (error completion) is turned on, and the error code is stored in o_uErrId (error code). Refer to ☞ Page 29 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 20 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).

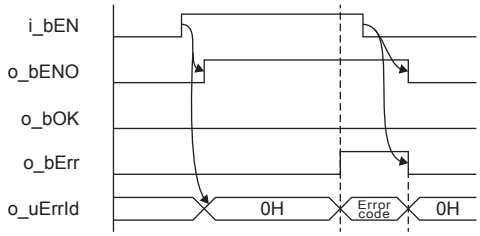


Timing chart of I/O signals

■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 the required system operation.
- This FB uses the following instructions.
  ■FX5 CPU module
  SP.SOCRCV instruction
  ■FX5-ENET, FX5-ENET/IP
  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. If this happens, turn i_bEN (Execute command) from off to 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 20 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	0.431 ms	0.872 ms	1 scan
	Receive data length: 1023 byte	0.527 ms	0.856 ms	1 scan
	Receive data length: 2046 byte	0.808 ms	0.904 ms	1 scan
FX5UJ	Receive data length: 1 byte	0.399 ms	0.731 ms	1 scan
	Receive data length: 1023 byte	0.471 ms	0.708 ms	1 scan
	Receive data length: 2046 byte	0.587 ms	0.700 ms	1 scan
FX5U, FX5UC*1*2	Receive data length: 1 byte	0.246 ms	0.396 ms	1 scan
	Receive data length: 1023 byte	0.290 ms	0.394 ms	1 scan
	Receive data length: 2046 byte	0.351 ms	0.394 ms	1 scan

GP.SOCRCV instruction

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

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

*2 The labels in the standard area are used.

Error code

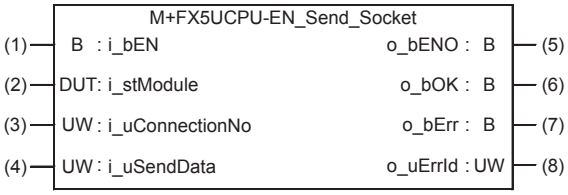
Error code (hexadecimal)	Description	Action
All error code	■FX5 CPU module Same as the error code caused by the data receiving (SP.SOCRCV) instruction. ■FX5-ENET, FX5-ENET/IP Same as the error code caused by the data receiving (GP.SOCRCV) instruction.	■FX5 CPU module Refer to the 📖MELSEC iQ-F FX5 User's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

2.4 M+model_Send_Socket (Sending of data)

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

Overview

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)
(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 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

■CPU module

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

Basic specifications

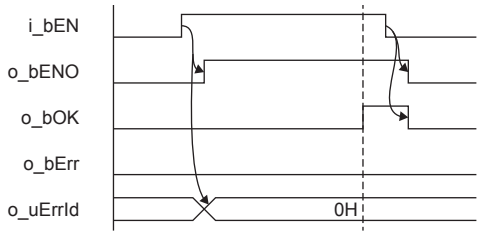
Item	Description
Language	Ladder diagram
Number of steps	■FX5 CPU module 62 steps ■FX5-ENET, FX5-ENET/IP 69 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX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

Processing

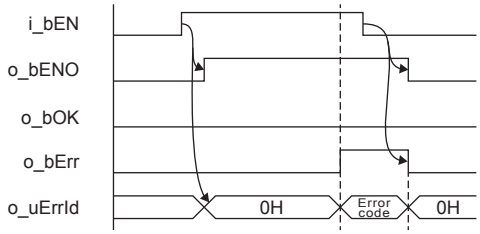
- When i_bEN (Execution command) is turned on, this function sends the data to the target device of the connection specified by the input argument.
- If an error occurs during data sending, o_bErr (error completion) is turned on, and the error code is stored in o_uErrId (error code). Refer to ☞ Page 33 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 20 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 the required system operation.
- This FB uses the following instructions.
  ■FX5 CPU module
  SP.SOCSND instruction
  ■FX5-ENET, FX5-ENET/IP
  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. If this happens, turn i_bEN (Execute command) from off to 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 20 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	3.02 ms	0.842 ms	3 scan
	Send data length: 1023 byte	4.87 ms	0.887 ms	7 scan
	Send data length: 2046 byte	8.36 ms	0.901 ms	16 scan
FX5UJ	Send data length: 1 byte	3.02 ms	0.671 ms	8 scan
	Send data length: 1023 byte	3.94 ms	0.739 ms	8 scan
	Send data length: 2046 byte	6.680 ms	0.738 ms	18 scan
FX5U, FX5UC*1*2	Send data length: 1 byte	2.74 ms	0.395 ms	10 scan
	Send data length: 1023 byte	3.79 ms	0.393 ms	10 scan
	Send data length: 2046 byte	4.52 ms	0.402 ms	16 scan

GP.SOCSND instruction

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

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

*2 The labels in the standard area are used.

Error code

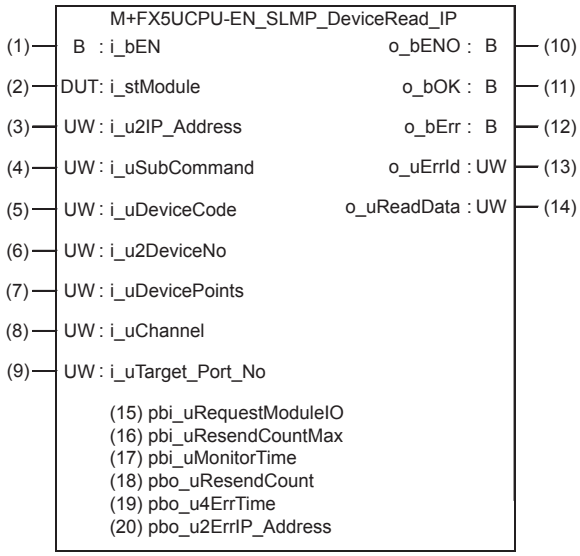
Error code (hexadecimal)	Description	Action
All error code	■FX5 CPU module Same as the error code caused by the data sending (SP.SOCSND) instruction. ■FX5-ENET, FX5-ENET/IP Same as the error code caused by the data sending (GP.SOCSND) instruction.	■FX5 CPU module Refer to the MELSEC iQ-F FX5 User's Manual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

2.5 M+FX5UCPU-EN_SLMP_DeviceRead_IP (SLMP compatible device reading)

No.	Name	Target module
1	M+FX5UCPU-EN_SLMP_DeviceRead_IP	FX5UJ, FX5U, and FX5UC CPU

Overview

Reads data from the target device with IP address specification.



Labels

Input label

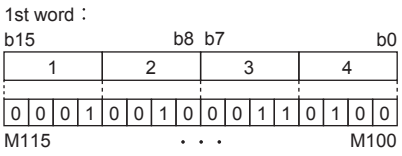
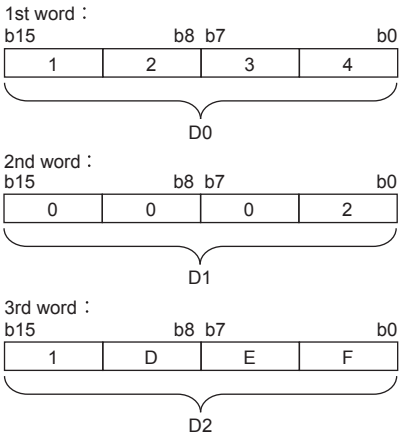
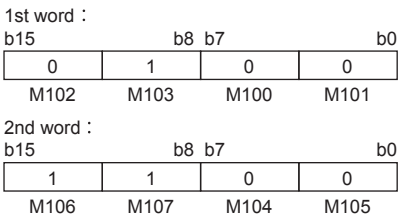
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_u2IP_Address	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 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 (for MELSEC-Q/L series). 1: Specify the device code in 4 digits and the start device number in 8 digits (for MELSEC iQ-R series).*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: 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.

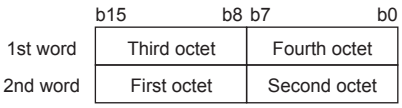
*1 It can be specified when the target device for reading is MELSEC iQ-R Series. It cannot be specified when the target device for reading is MELSEC Q/L Series or MELSEC iQ-F Series.

*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: To control system CPU • 03D1H: To standby CPU • 03D2H: To system A CPU • 03D3H: To 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 s • 1 to 32767: 1 to 32767 s
(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

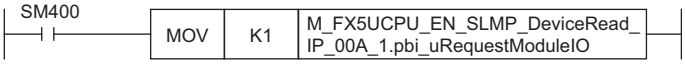
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

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

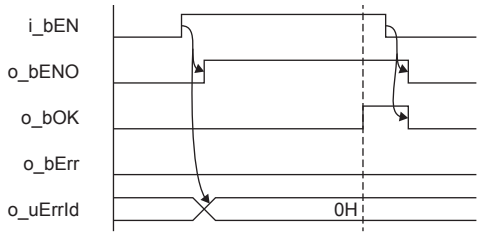
Processing

- 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 (SLMP))
- 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. The error code 100 (hexadecimal) is stored in o_uErrId (error code). Refer to ☞ Page 40 Error code for details on the error codes.
- If an error occurs during device data reading, o_bErr (error completion) is turned on, and the error code is stored in o_uErrId (error code). Refer to ☞ Page 40 Error code for details on the error codes.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).

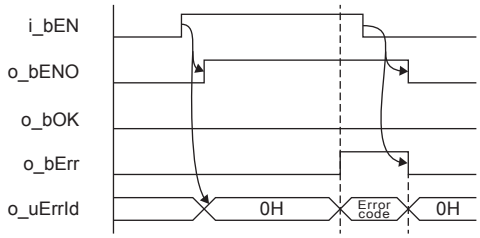


Timing chart of I/O signals

■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 the required system 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. If this happens, turn i_bEN (Execute command) from off to 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.
- Every input must be provided with a value for proper FB operation.

Parameter setting

No parameters are required to use this FB.

Example of use

For an example of use, refer to ☞ Page 177 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	5.190 ms	0.735 ms	16 scan
	0th bit of the subcommand: 0 Number of device points: 960	11.400 ms	0.869 ms	25 scan
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	5.190 ms	0.735 ms	16 scan
	0th bit of the subcommand: 0 Number of device points: 960	11.400 ms	0.869 ms	25 scan
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	5.190 ms	0.735 ms	16 scan
	0th bit of the subcommand: 0 Number of device points: 960	11.400 ms	0.869 ms	25 scan

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

*2 The labels in the standard area are used.

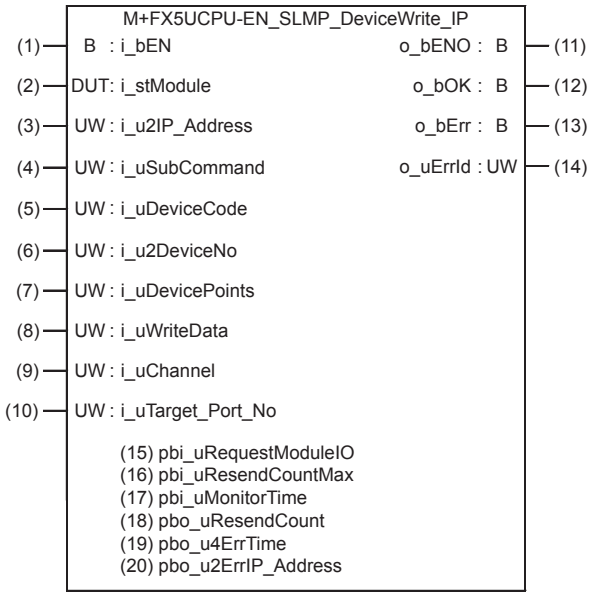
Error code

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 (Ethernet Communication)

2.6 M+FX5UCPU-EN_SLMP_DeviceWrite_IP (SLMP compatible device writing)

Overview

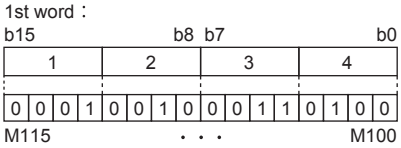
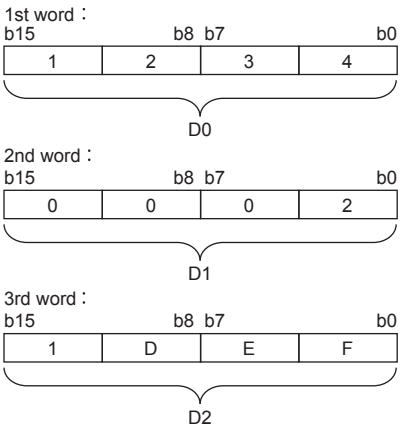
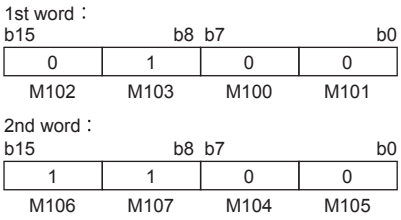
Writes data to the target device by specifying IP address.



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 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: 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
(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.

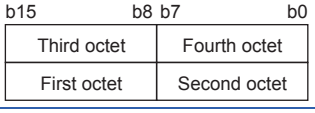
*1 It can be specified when the target device for writing is MELSEC iQ-R Series. It cannot be specified when the target device for writing is MELSEC Q/L Series or MELSEC iQ-F Series.

*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: To control system CPU • 03D1H: To standby CPU • 03D2H: To system A CPU • 03D3H: To 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 s • 1 to 32767: 1 to 32767 s
(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

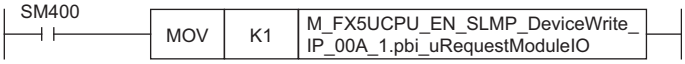
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.030G or later

Basic specifications

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

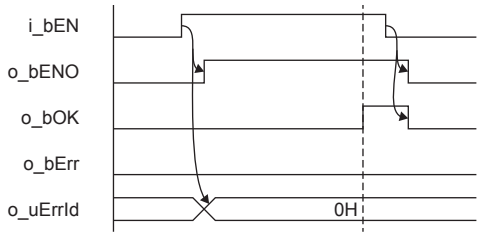
Processing

- 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 (SLMP))
- 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. The error code 100 (hexadecimal) is stored in o_uErrId (error code). Refer to ☞ Page 46 Error code for details on the error codes.
- 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). Refer to ☞ Page 46 Error code for details on the error codes.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).

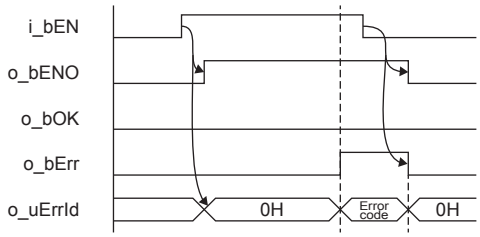


Timing chart of I/O signals

■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 the required system 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. If this happens, turn i_bEN (Execute command) from off to 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.
- Every input must be provided with a value for proper FB operation.

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	4.34 ms	0.744 ms	11 scan
	0th bit of the subcommand: 0 Number of device points: 960	11.0 ms	0.90 ms	20 scan
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	4.34 ms	0.744 ms	11 scan
	0th bit of the subcommand: 0 Number of device points: 960	11.0 ms	0.90 ms	20 scan
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	4.34 ms	0.744 ms	11 scan
	0th bit of the subcommand: 0 Number of device points: 960	11.0 ms	0.90 ms	20 scan

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

*2 The labels in the standard area are used.

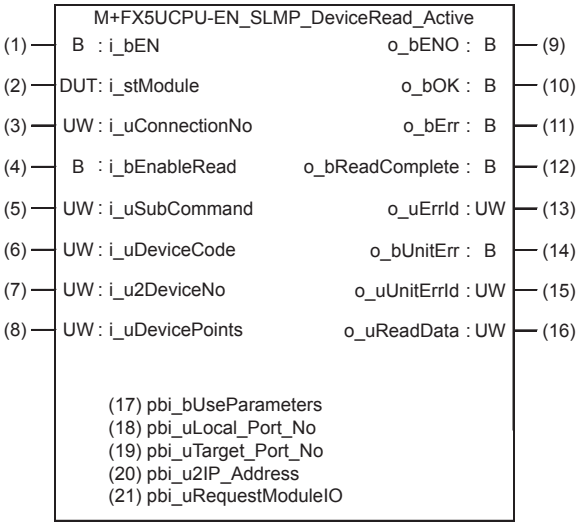
Error code

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 (Ethernet Communication)

2.7 M+FX5UCPU-EN_SLMP_DeviceRead_Active (SLMP compatible device reading through active connection)

Overview

Perform the open/close processing and reading device data of SLMP compatible devices by Active connection.



Labels

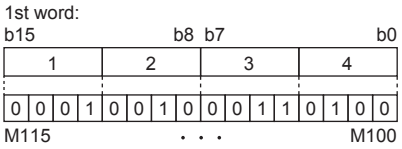
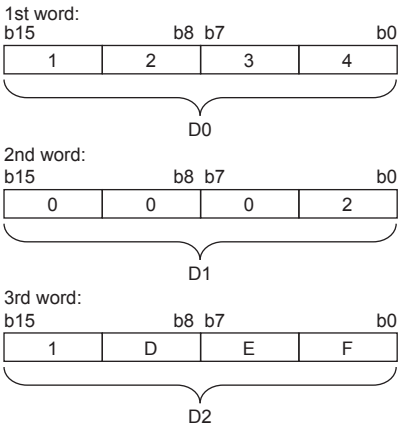
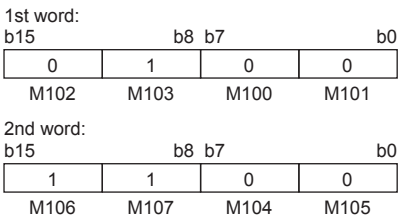
Input label

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 (for MELSEC-Q/L series). 1: Specify the device code in 4 digits and the start device number in 8 digits (for MELSEC iQ-R series).*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: To control system CPU • 03D1H: To standby CPU • 03D2H: To system A CPU • 03D3H: To system B CPU

FB details

Available device

■CPU module

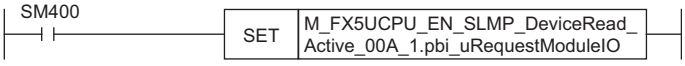
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.040S or later

Basic specifications

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

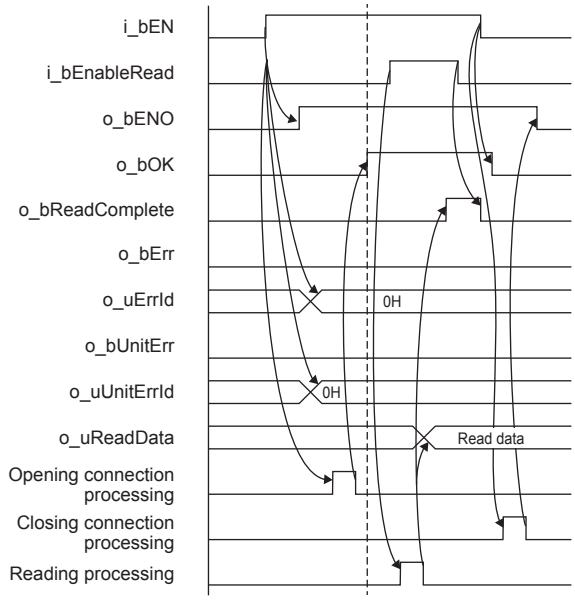
Processing

- 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 device points are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 100 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 54 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. Also, Error code 101 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, ☞ Page 54 Error code.
- When an error has occurred in the reading processing of the open/close/information 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 54 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).

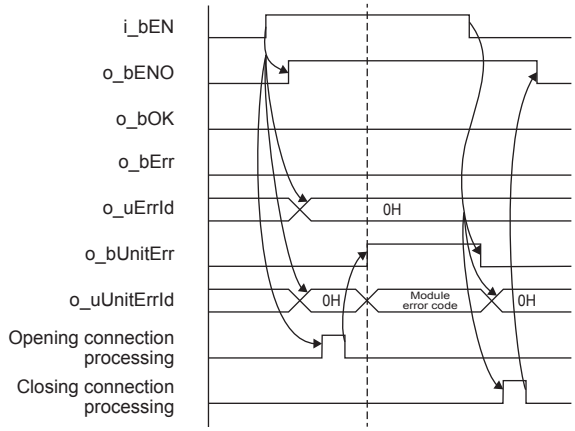


Timing chart of I/O signals

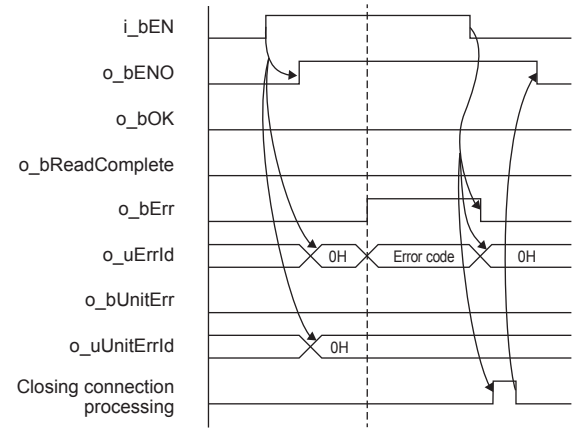
■For normal completion



■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 the required system 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 off and on i_bEN (Execution command) 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.
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 20 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	7.65 ms	1.24 ms	12 scan
	0th bit of the subcommand: 0 Number of device points: 960	14.40 ms	1.60 ms	17 scan
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	6.35 ms	0.743 ms	12 scan
	0th bit of the subcommand: 0 Number of device points: 960	10.50 ms	1.30 ms	25 scan
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	5.49 ms	0.477 ms	15 scan
	0th bit of the subcommand: 0 Number of device points: 960	7.02 ms	0.794 ms	22 scan

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

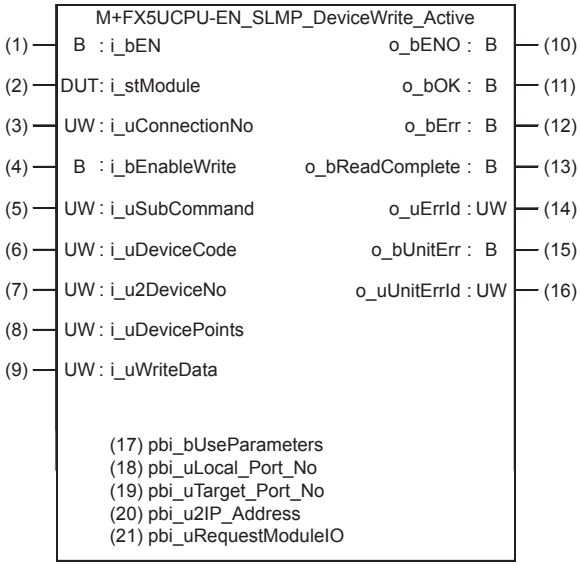
Error code

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 (Ethernet Communication)

2.8 M+FX5UCPU-EN_SLMP_DeviceWrite_Active (SLMP compatible device writing through active connection)

Overview

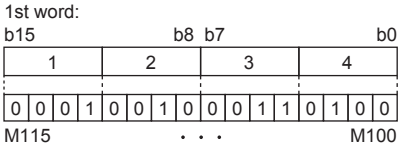
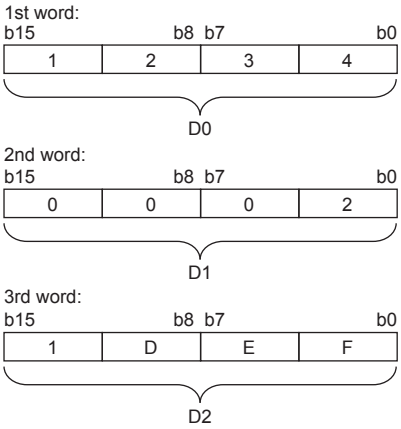
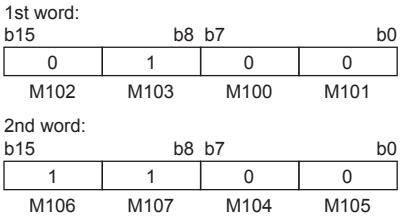
Perform the open/close processing and writing device data of SLMP compatible devices by Active connection.



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. 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: To control system CPU • 03D1H: To standby CPU • 03D2H: To system A CPU • 03D3H: To system B CPU

FB details

Available device

■CPU module

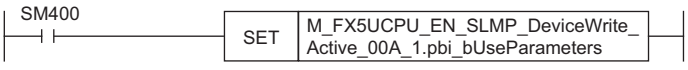
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.040S or later

Basic specifications

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

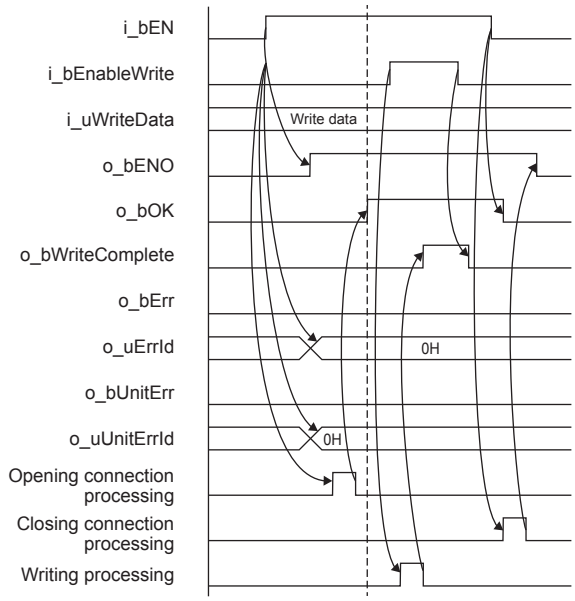
Processing

- 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 device points are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 100 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 61 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. Also, Error code 101 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 61 Error code.
- When an error has occurred in the writing processing of the open/close/information 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 61 Error code.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).

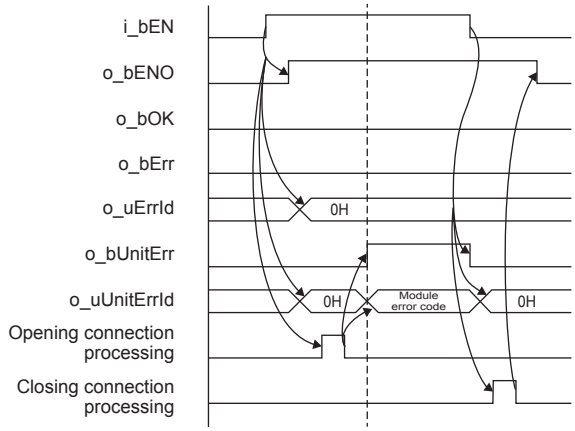


Timing chart of I/O signals

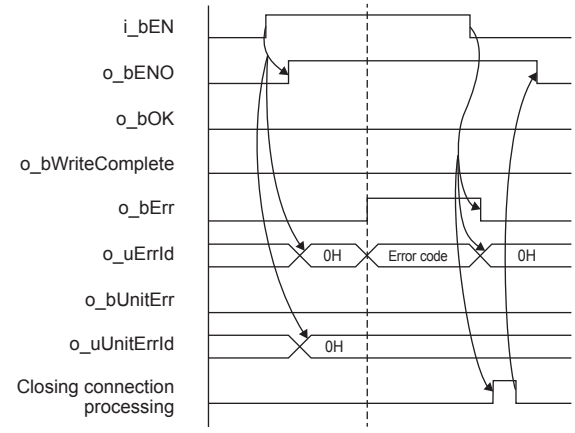
■For normal completion



■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 the required system 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 off and on i_bEN (Execution command) 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.
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 20 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	5.98 ms	0.769 ms	15 scan
	0th bit of the subcommand: 0 Number of device points: 960	12.00 ms	1.750 ms	27 scan
FX5UJ	0th bit of the subcommand: 0 Number of device points: 1	5.98 ms	0.769 ms	15 scan
	0th bit of the subcommand: 0 Number of device points: 960	12.00 ms	1.750 ms	27 scan
FX5U, FX5UC*1*2	0th bit of the subcommand: 0 Number of device points: 1	5.98 ms	0.769 ms	15 scan
	0th bit of the subcommand: 0 Number of device points: 960	12.00 ms	1.750 ms	27 scan

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

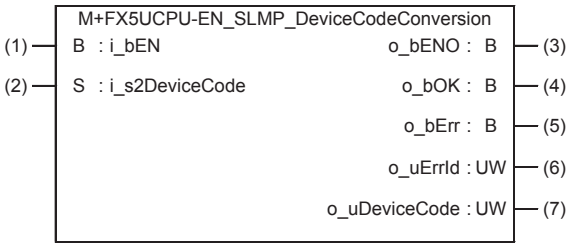
Error code

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 (Ethernet Communication)

2.9 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Device code reading of SLMP communication FB)

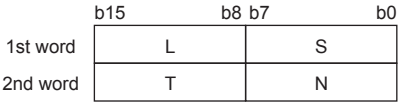
Overview

Calculate the value to be input to the device code for SLMP 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_s2DeviceCode	Device code (input)	Character string (32) (0..1)	—	Stores the device code (string). (Ex.) When inputting the device code "LSTN"  Input K0 in a part which characters are not input. For the details of the device code, refer to the MELSEC iQ-F FX5 User's Manual (SLMP).

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	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.040S or later

Basic specifications

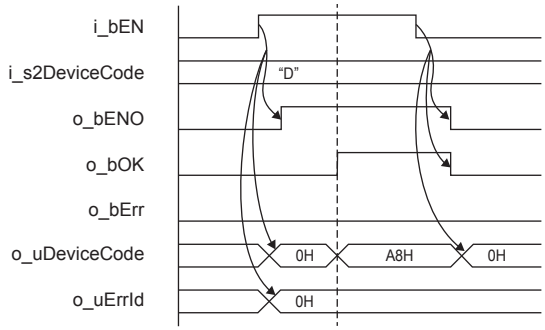
Item	Description
Language	Ladder diagram
Number of steps	580 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to 📖GX Works3 Operating Manual.
The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

Processing

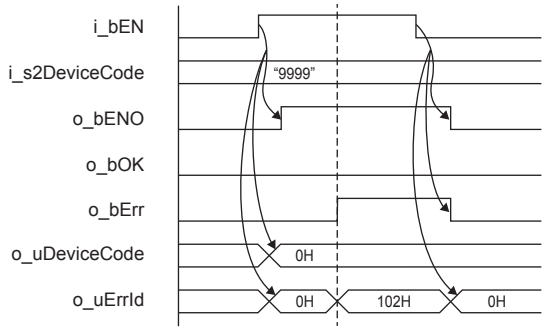
- Convert i_s2DeviceCode (device code (input)) to the binary code by turning i_bEN (Execution command) on, and the binary code is output to o_uDeviceCode (device code (output)).
- When the values of i_s2DeviceCode (device code (input)) are incorrect, o_bErr (Error completion) turns on, and the FB processing is stopped. Also, Error code 102 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 65 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 the required system 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 177 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	0.516 ms	1.620 ms	1 scan
	When the device code is LSTN	0.514 ms	1.560 ms	1 scan
FX5UJ	When the device code is W	0.461 ms	1.230 ms	1 scan
	When the device code is LSTN	0.460 ms	1.210 ms	1 scan
FX5U, FX5UC*1*2	When the device code is W	0.372 ms	0.816 ms	1 scan
	When the device code is LSTN	0.376 ms	0.812 ms	1 scan

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

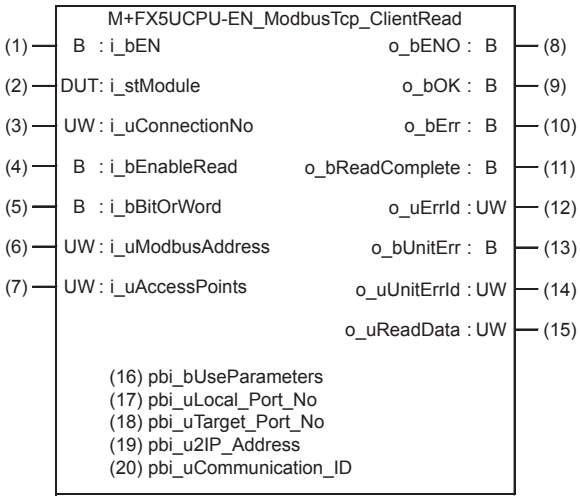
Error code

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 (SLMP) or SLMP Reference Manual.

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

Overview

Perform the open/close processing and reading by MODBUS/TCP client in socket communication.



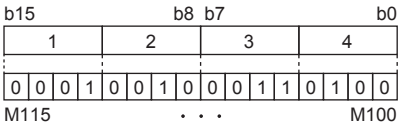
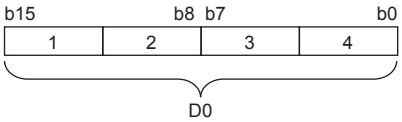
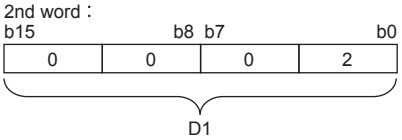
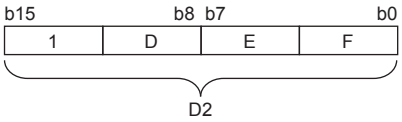
Labels

Input label

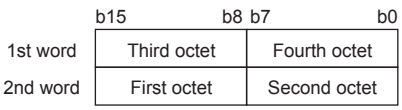
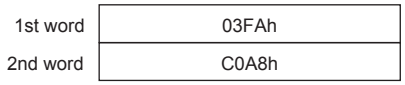
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the CPU module.
(3)	i_uConnectionNo	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	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.045X or later

Basic specifications

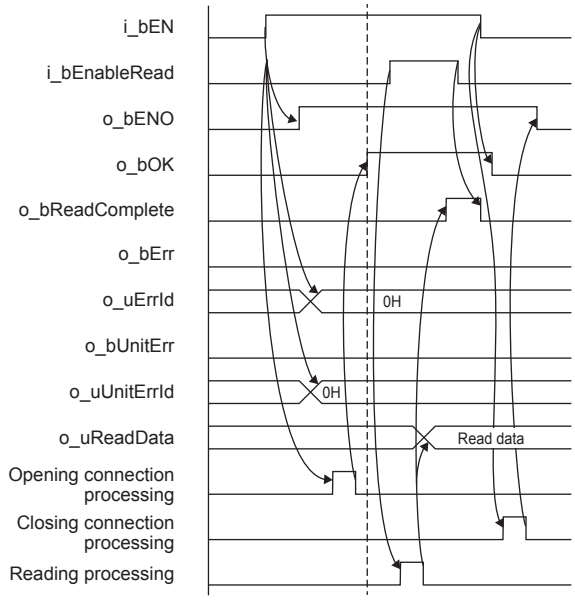
Item	Description
Language	Ladder diagram
Number of steps	813 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to 📖GX Works3 Operating Manual.
The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

Processing

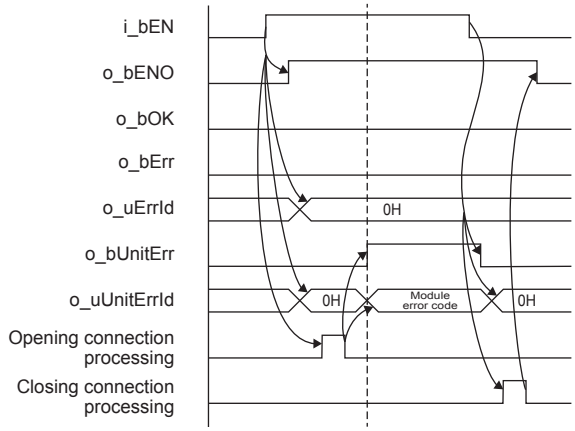
- Perform Active open processing by turning i_bEN (Execution command) on. When the connection is the open status, the open processing is not executed. After the open processing has completed, o_bOK (Normal completion) turns on.
- Perform Active close processing by turning i_bEN (Execution command) off. 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, Error code 100 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 71 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. Also, Error code 101 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, ☞ Page 71 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 71 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 20 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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

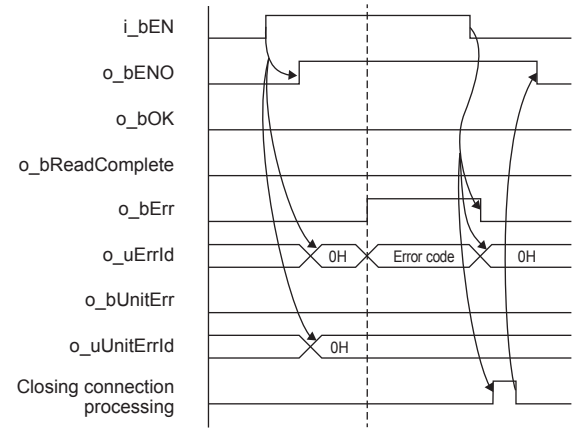
■For normal completion



■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 the required system 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 off and on i_bEN (Execution command) 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.
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 20 Parameter setting.

Performance value

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

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

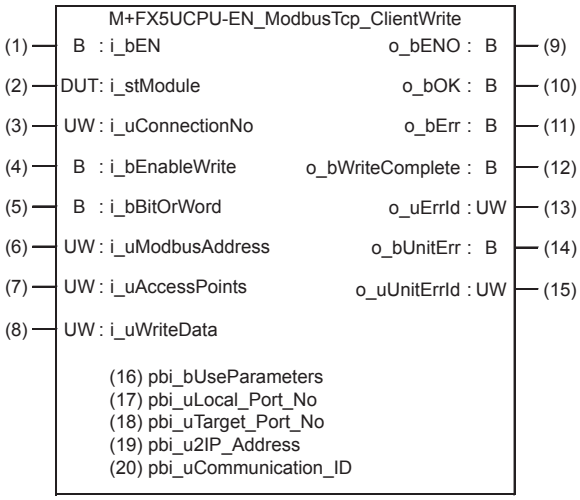
Error code

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 (Ethernet Communication)

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

Overview

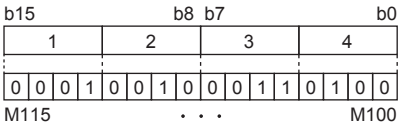
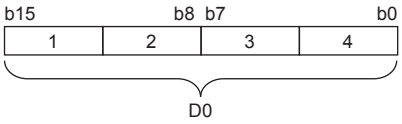
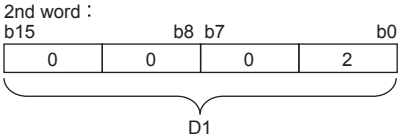
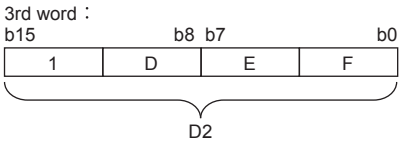
Perform the open/close processing and writing by MODBUS/TCP client in socket communication.



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

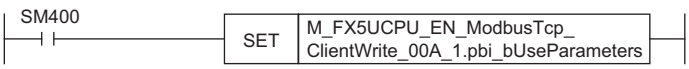
Target module	Firmware Version	Engineering tool
FX5S	Version 1.000 or later	GX Works3 Version 1.080J or later
FX5UJ	Version 1.000 or later	GX Works3 Version 1.060N or later
FX5U, FX5UC	Version 1.040 or later	GX Works3 Version 1.045X or later

Basic specifications

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

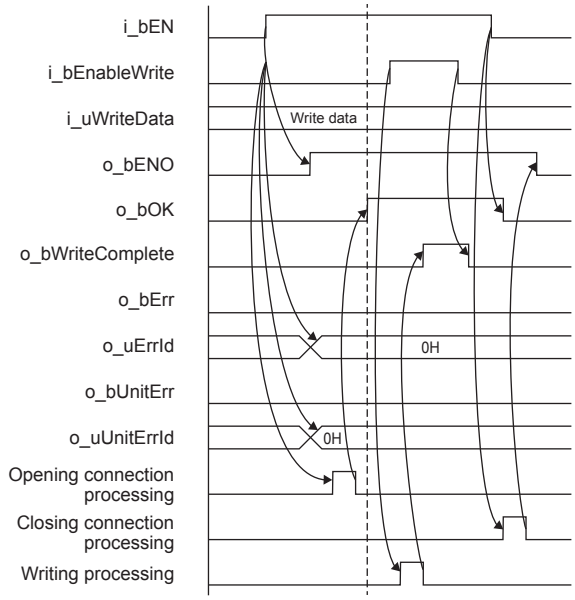
Processing

- 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, Error code 100 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 78 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. Also, Error code 101 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 78 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 78 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 20 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).

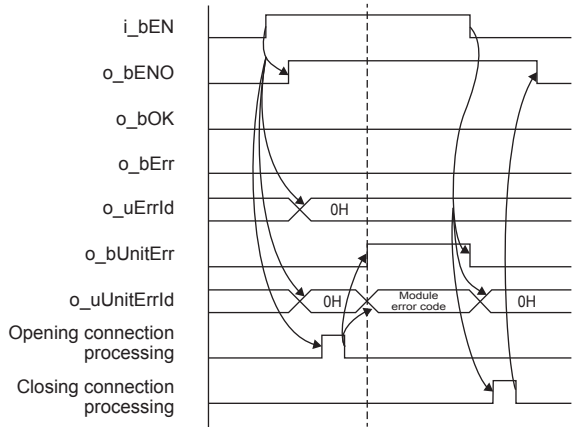


Timing chart of I/O signals

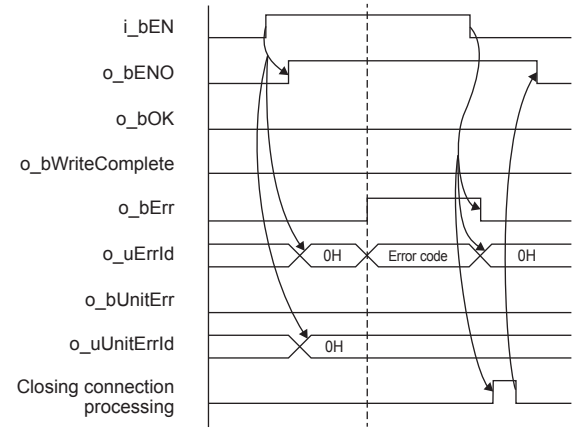
■For normal completion



■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 the required system 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 off and on i_bEN (Execution command) 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.
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 20 Parameter setting.

Performance value

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

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

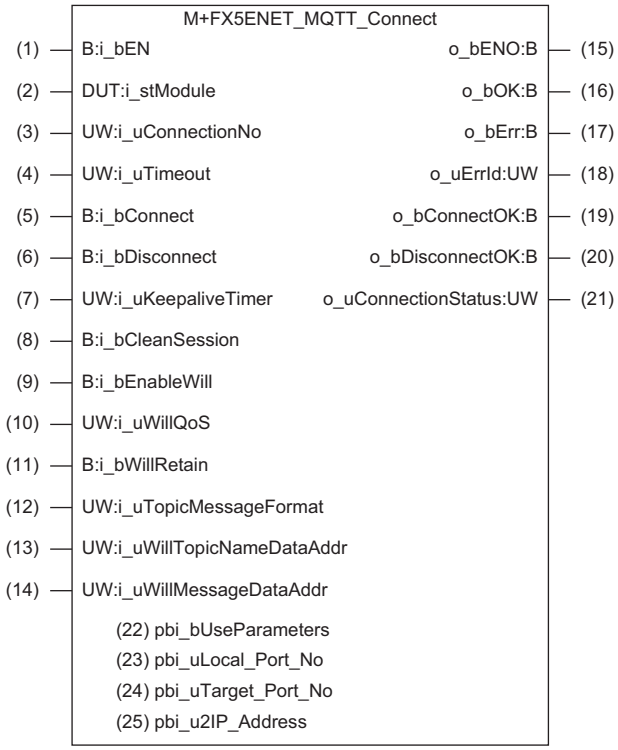
Error code

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 (Ethernet Communication)

2.12 M+FX5ENET_MQTT_Connect (MQTT connection establishment)

Overview

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.
(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 for when the existing session is present during 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_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	Outputs the execution status of the FB. • 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-ENET 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]	The setting range differs depending on the target module.	Specify the destination port number. ■FX5-ENET 1 to 65534
(25)	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. 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 ■FX5 CPU module 0.0.0.1 to 223.255.255.254*1 ■FX5-ENET 0.0.0.1 to 223.255.255.255

*1 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	1.200 or later	GX Works3 Version 1.095Z or later

■CPU module

Target module	Firmware version	Engineering tool
FX5U, FX5UC	Version 1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	Version 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
The amount of 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
The 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.
The amount of file register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

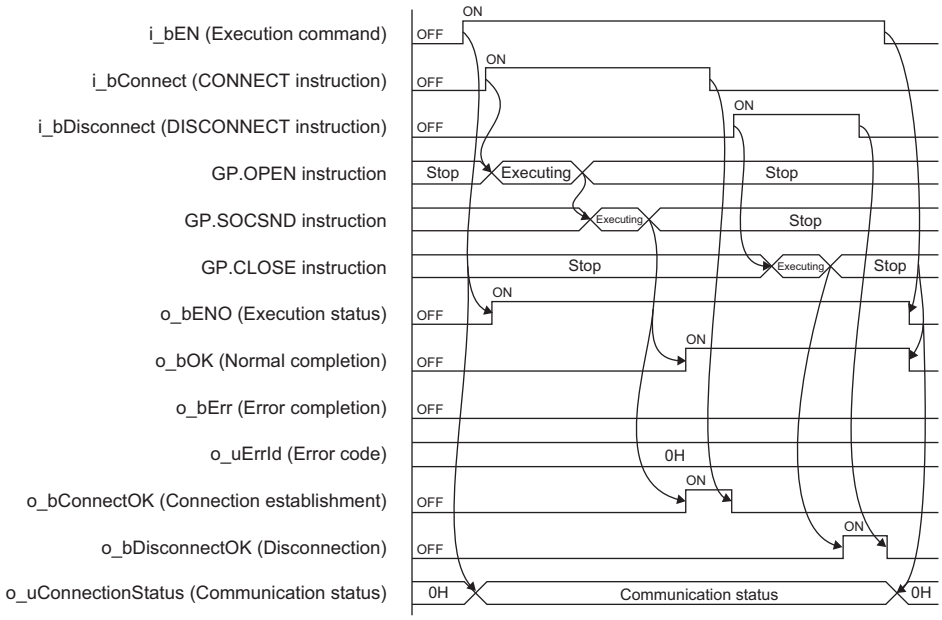
Processing

- 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.

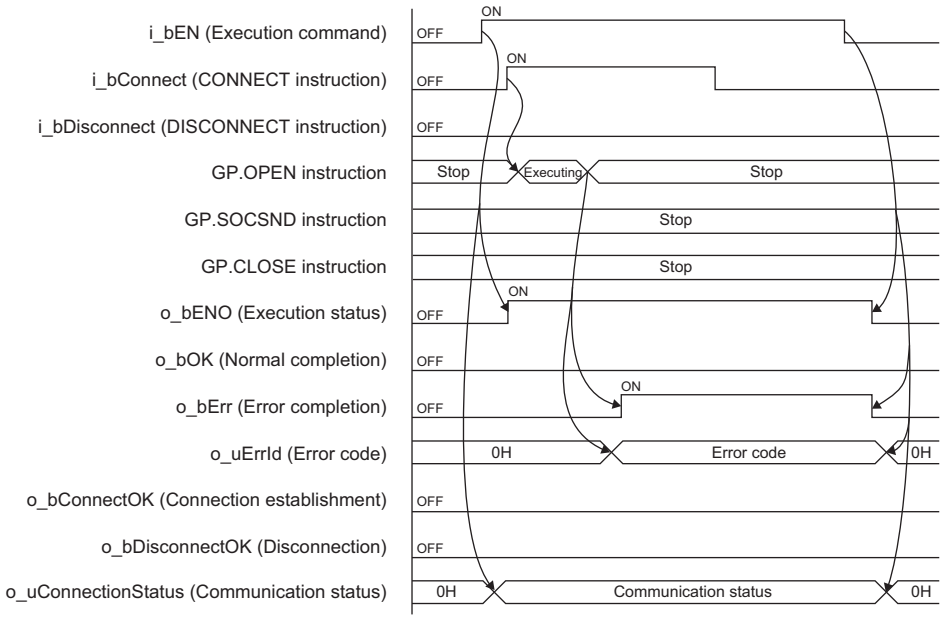
☞ Page 84 Parameter setting

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) 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-ENET 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

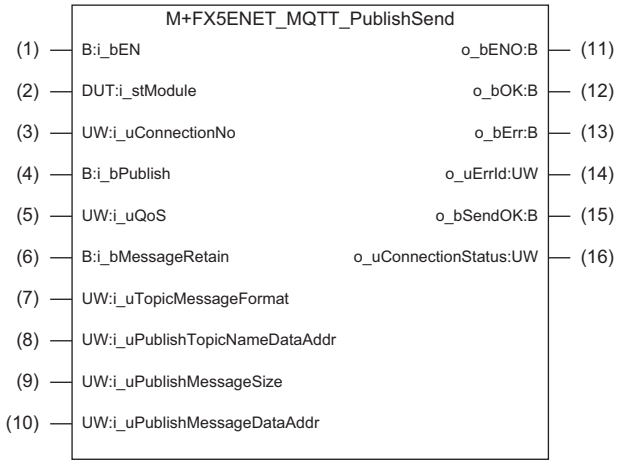
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	Contention has occurred between i_bConnect (CONNECT instruction) and i_bDisconnect (DISCONNECT instruction).	After reviewing the setting, 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) has 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-ENET User's Manual

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

2.13 M+FX5ENET_MQTT_PublishSend (Sending of MQTT data)

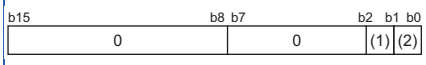
Overview

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, set NULL at the position of the maximum length + 1 in the send message. Therefore, secure the space of 32769 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	Outputs the execution status of the FB. • 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-ENET 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	Version 1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	Version 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
The amount of 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
The 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.
The amount of file register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

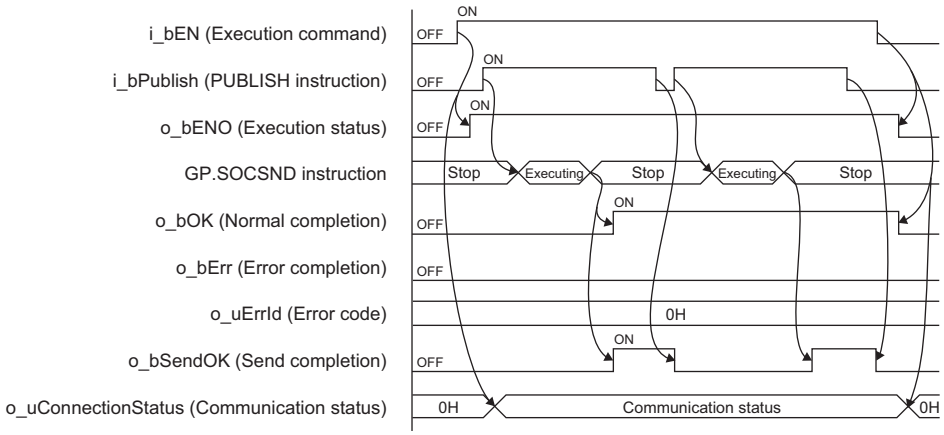
Processing

- 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.

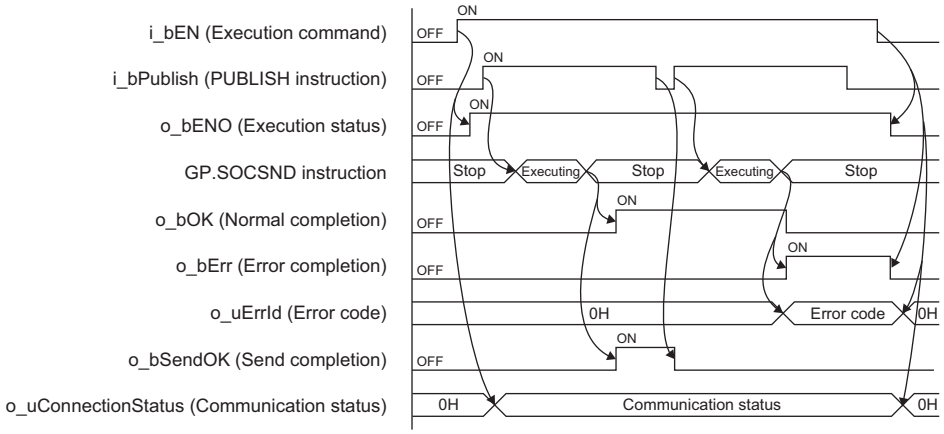
☞ Page 84 Parameter setting

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 84 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

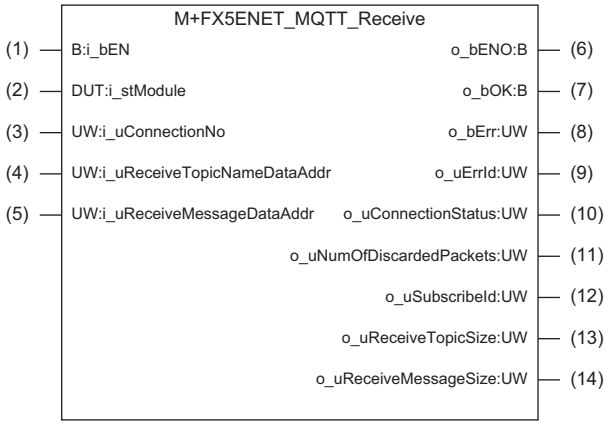
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
102H	The i_uQoS (QoS) setting value is out of range.	After reviewing the setting, re-execute the FB.
104H	The i_uTopicMessageFormat (Topic/message 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) has 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-ENET 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-ENET 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

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	Outputs the execution status of the FB. • 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-ENET 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	Version 1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	Version 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
The amount of 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
The 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.
The amount of file register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

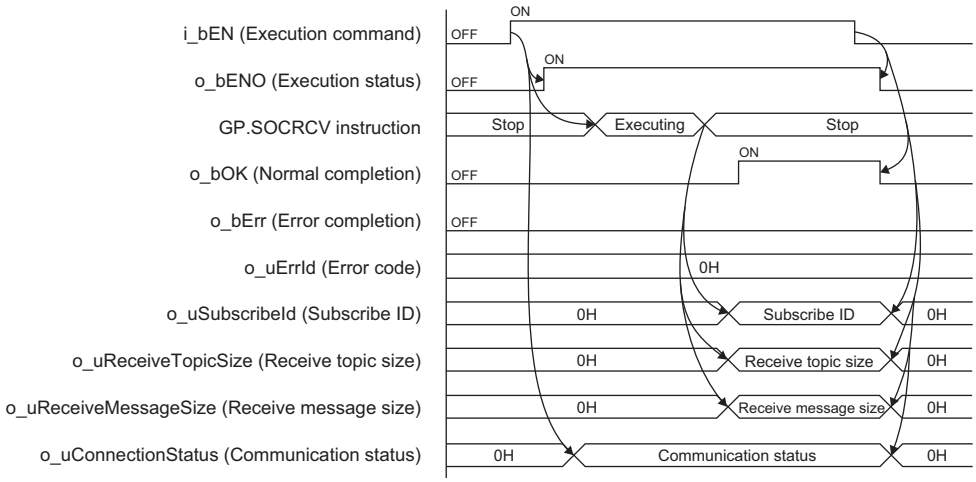
Processing

- 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.

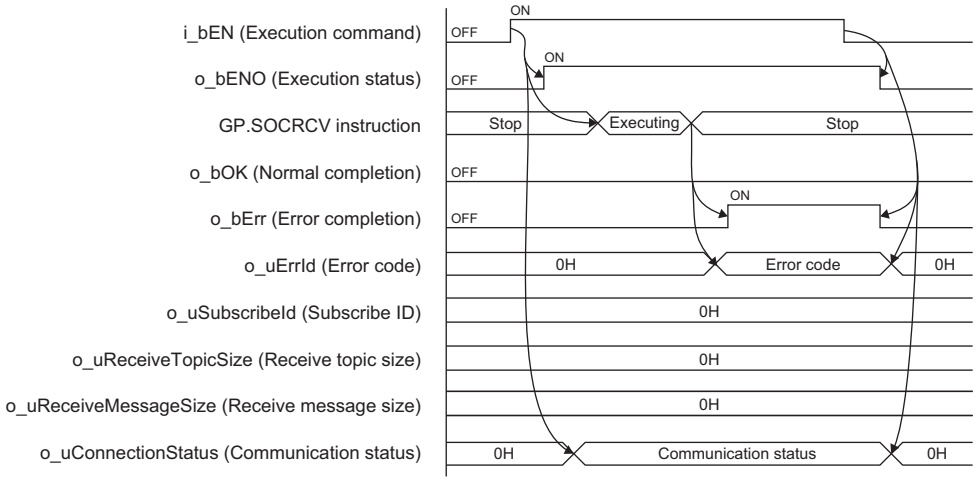
☞ Page 84 Parameter setting

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 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 84 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

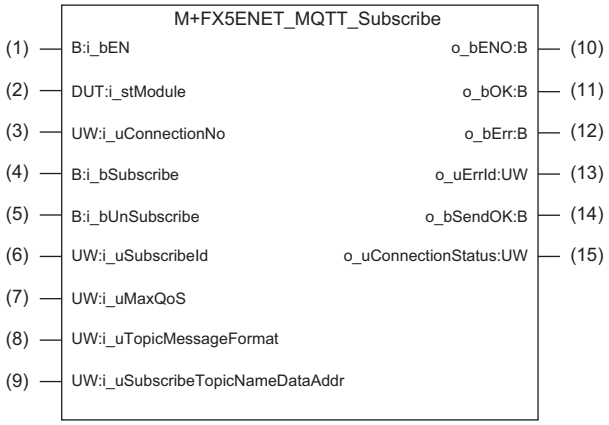
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
200H	i_bEN (Execution command) has turned off during the processing.	Maintain the on status of the execution command until normal completion, 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-ENET 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-ENET User's Manual

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

2.15 M+FX5ENET_MQTT_Subscribe (Sending of Subscribe command)

Overview

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*2 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*2 is used for topic/message. • 2: ASCII is used for topic and binary is used for message. • 3: The Unicode string*2 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*2	—	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 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 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	Outputs the execution status of the FB. • 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-ENET 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	Version 1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	Version 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
The amount of 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
The 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.
The amount of file register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

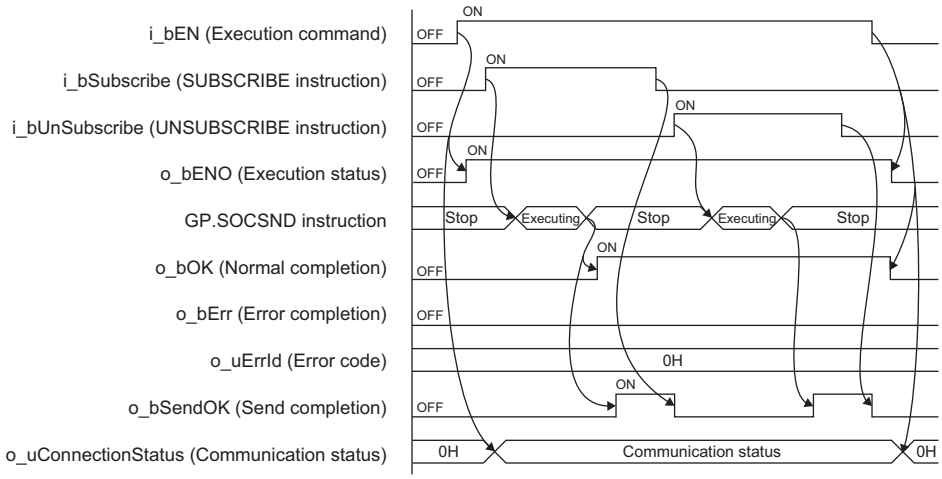
Processing

- 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.

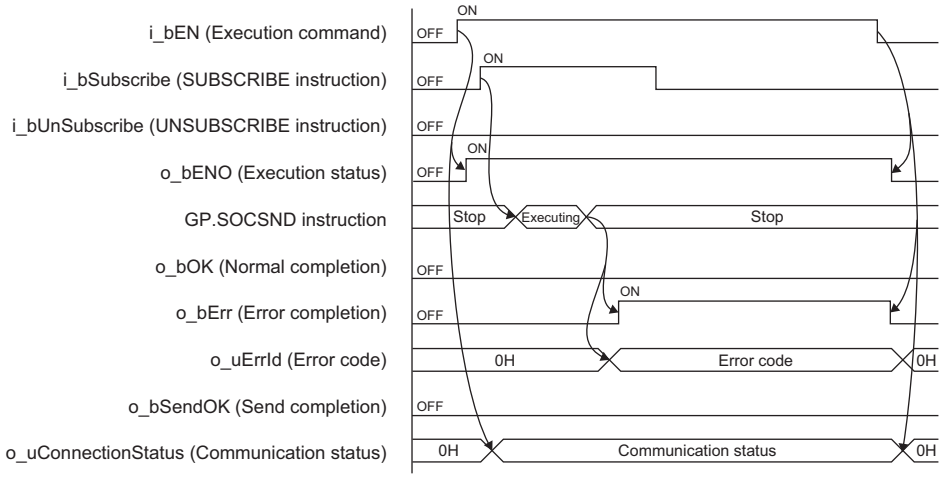
☞ Page 84 Parameter setting

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 84 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

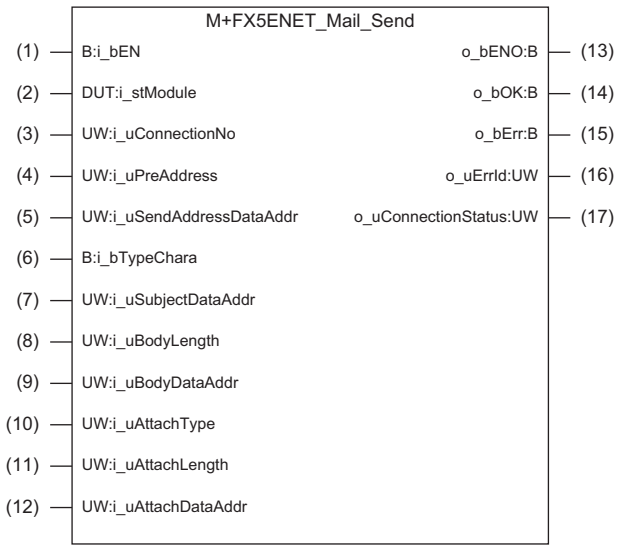
Error code (hexadecimal)	Description	Action
100H	The i_uConnectionNo (Connection No.) setting value is out of range.	After reviewing the setting, re-execute the FB.
101H	Contention has occurred between i_bSubscribe (SUBSCRIBE instruction) and i_bUnSubscribe (UNSUBSCRIBE instruction).	Review the timing 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) has 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-ENET User's Manual

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

2.16 M+FX5ENET_Mail_Send (Sending of E-mail)

Overview

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.

No.	Variable name	Name	Data type	Range	Description
(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.
(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	Outputs the execution status of the FB. • 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-ENET 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	Version 1.280 or later	GX Works3 Version 1.095Z or later
FX5UJ	Version 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
The amount of 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
The 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.
The amount of file register usage	0 points
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

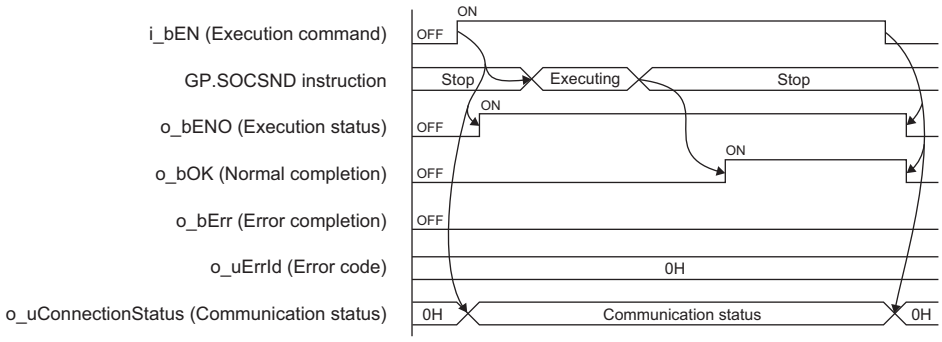
Processing

- 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.

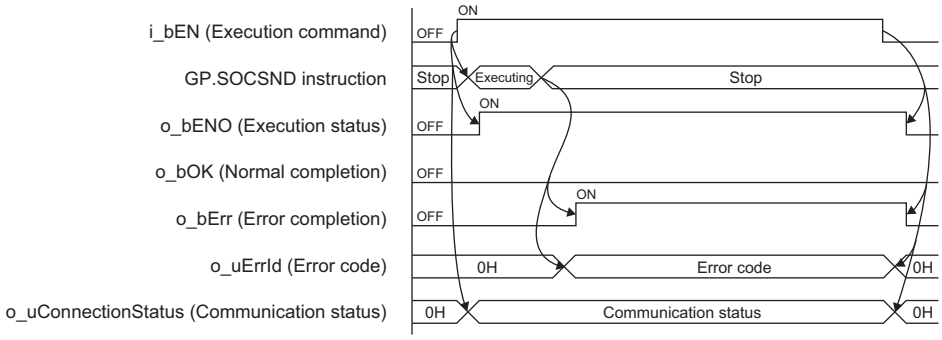
☞ Page 84 Parameter setting

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-ENET 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) has 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-ENET User's Manual

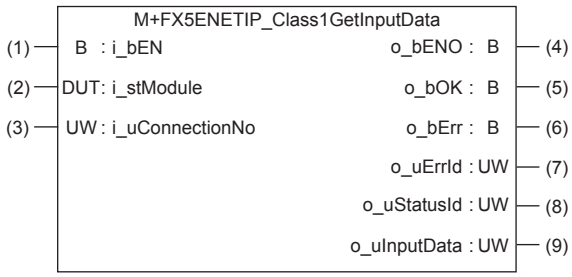
*1 The output will be only for a single scan.

3 FX5 EtherNet/IP-EQUIPPED MODULE FB

3.1 M+FX5ENETIP_Class1GetInputData (Class 1 communication input data acquisition)

Overview

Acquires the input data of the designated 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

■FX5 Ethernet-equipped module

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

■CPU module

MELSEC iQ-F series

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	471 Step The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to 📖GX Works3 Operating Manual.
The amount of label usage	• Label: 0.02 K point (Word) • Latch label: 0 K point (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 📖GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

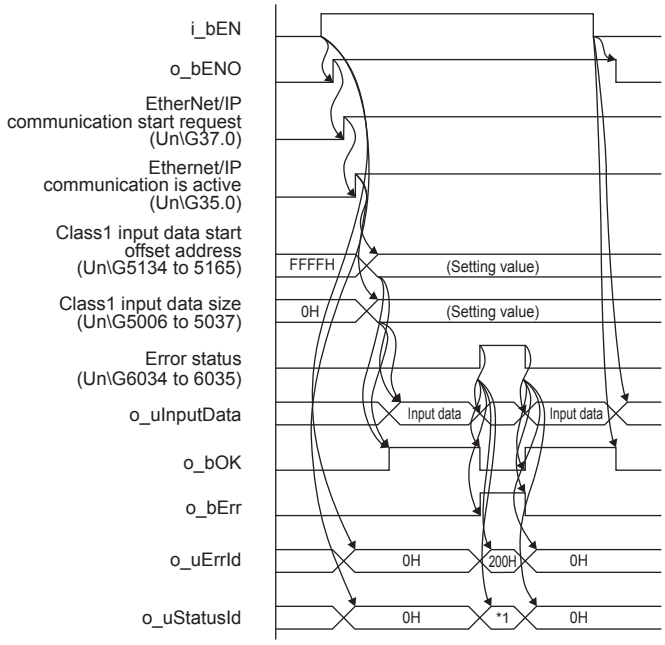
Processing

- By turning i_bEN (Execution command) on, the input data of the designated 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 110 Parameter setting.

Timing chart of I/O signals

■For normal completion

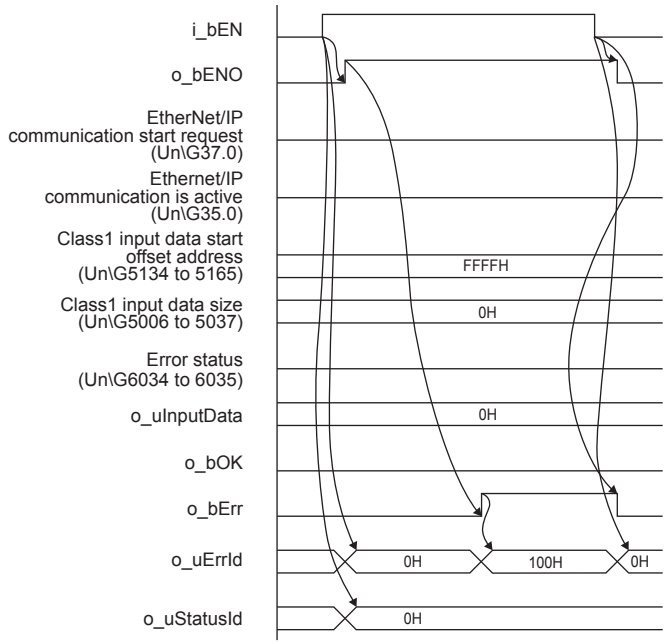
When the operation is recovered after an error occurs for a certain time during communication



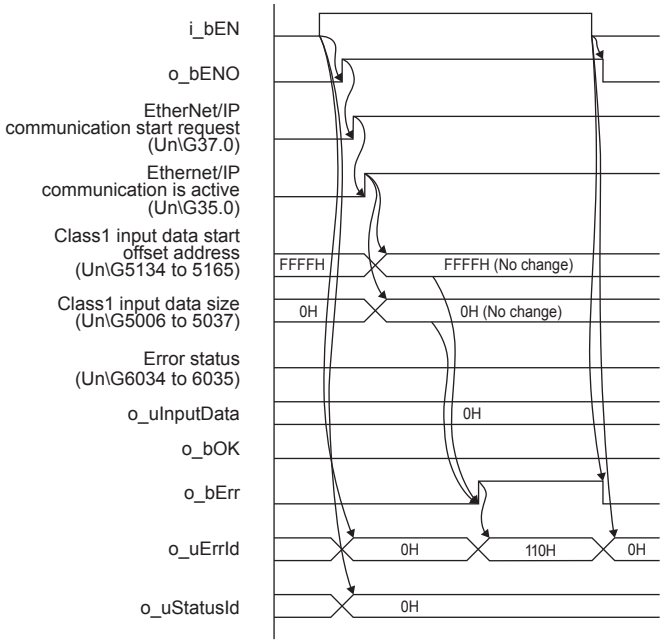
*1 Error code of connection communication error

■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.
- After o_bOK (Normal completion) or o_bErr (Error completion) turns on, turn off i_bEN (Execution command). 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 Setting] ⇨ [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 MELSEC iQ-F FX5-ENET/IP User's Manual.

For the details of EtherNet/IP Configuration Tool for FX5-ENET/IP, refer to MELSEC iQ-F FX5-ENET/IP User's Manual.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	—	105.0 ms	0.992 ms	203 scan
FX5U, FX5UC*1*2	—	56.4 ms	0.748 ms	131 scan

*1 When the program capacity is set to 128 K 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 User's Manual.

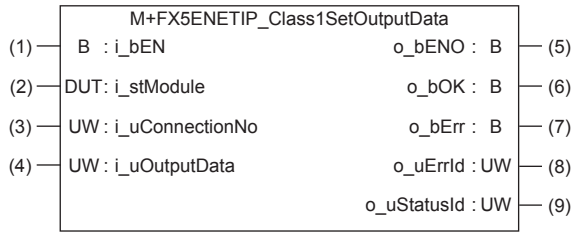
Version upgrade history

Version	Date	Description
00A	October 2019	First edition
01A	October 2020	Initialization processing in the FB is revised.

3.2 M+FX5ENETIP_Class1SetOutputData (Class 1 communication output data setting)

Overview

Updates the output data of the designated 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

■FX5 Ethernet-equipped module

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

■CPU module

MELSEC iQ-F series

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	471 Step The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to 📖GX Works3 Operating Manual.
The amount of label usage	• Label: 0.02 K point (Word) • Latch label: 0 K point (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 📖GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Always executed

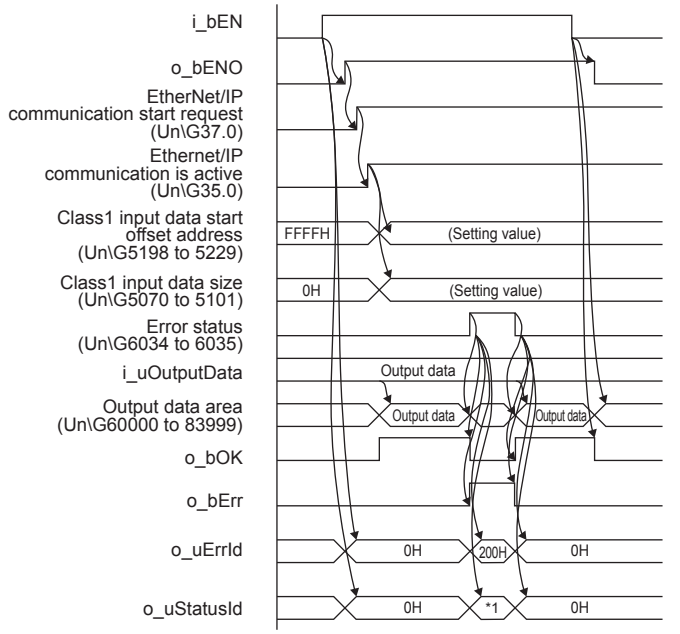
Processing

- By turning i_bEN (Execution command) on, the output data of the designated connection is acquired by Class1 communication.
- The designated number is continuously stored in the output area for the designated 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 device transferred from i_uOutputData (Output data storage device), refer to the 📖MELSEC iQ-F FX5-ENET/IP 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 110 Parameter setting.

Timing chart of I/O signals

■For normal completion

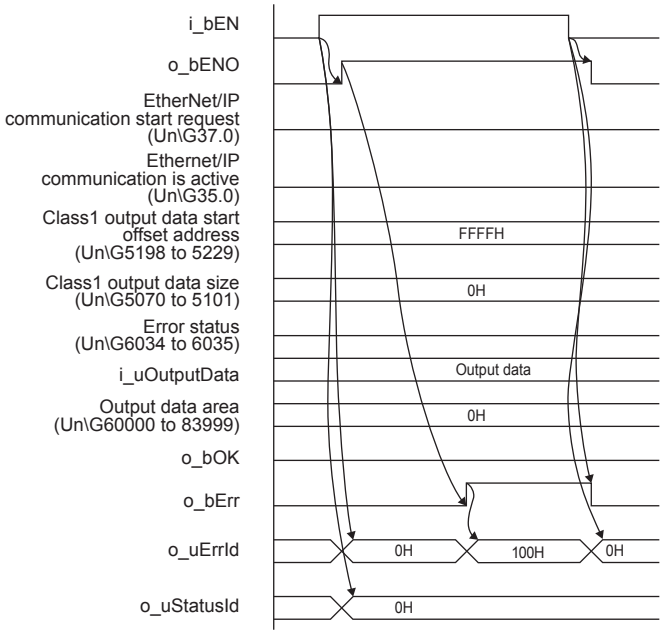
When the operation is recovered after an error occurs for a certain time during communication



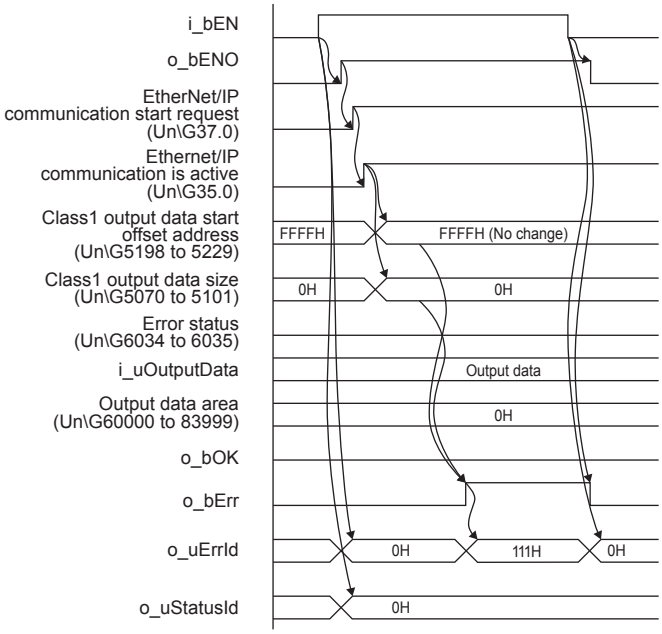
*1 Error code of connection communication error

■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.
- After o_bOK (Normal completion) or o_bErr (Error completion) turns on, turn off i_bEN (Execution command). 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 110 Parameter setting.

Performance value

CPU module	Measurement conditions	Performance value		Number of scans
		Processing time	Maximum scan time	
FX5UJ	—	105.0 ms	0.950 ms	202 scan
FX5U, FX5UC[*1*2]	—	55.8 ms	0.739 ms	131 scan

*1 When the program capacity is set to 128 K 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 User's Manual.

Version upgrade history

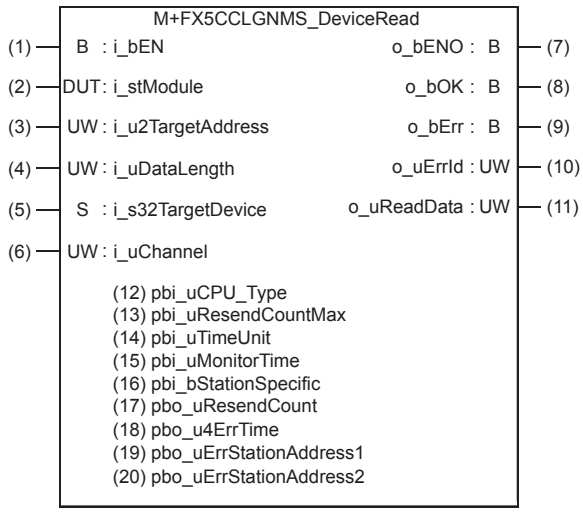
Version	Date	Description
00A	October 2019	First edition
01A	October 2020	Initialization processing in the FB is revised.

4 CC-Link IE TSN MODULE FB

4.1 M+FX5CCLGNMS_DeviceRead (Reading of another station device)

Overview

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 User's Manual (CC-Link IE TSN) 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 normally.
(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 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: 1 s • 1: 100 ms
(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 1 s • Valid range 1 to 32767: 1 to 32767 seconds ■When arrival monitoring time unit is set to 100 ms • Valid range 1 to 65535: 1 to 65535× 100 ms
(16)	pbi_bStationSpecific	Target station address specification method	Bit	ON, OFF	Specify the target station 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: For IP address 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: For IP address 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

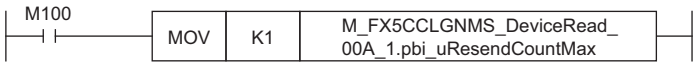
FX5U/FX5UC CPU module

Basic specifications

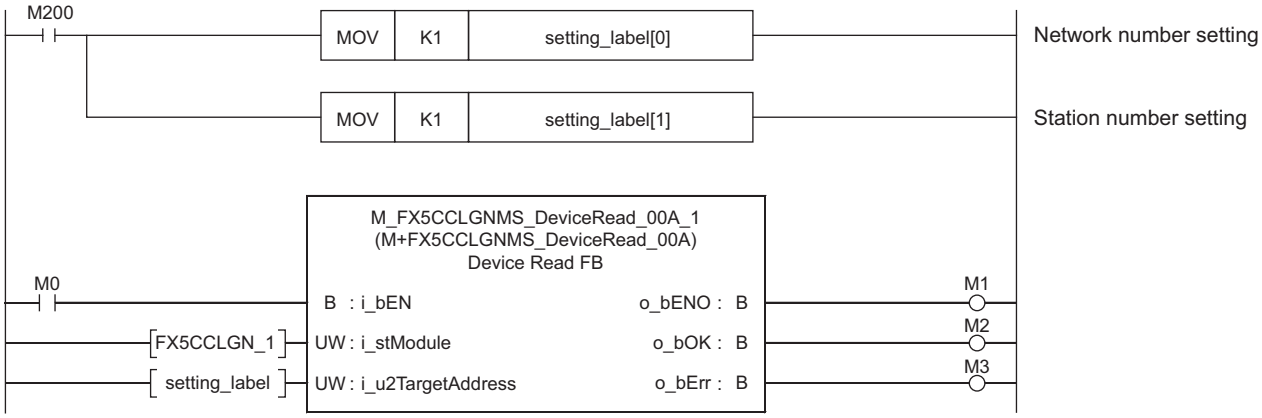
Item	Description
Language	Ladder diagram
Number of steps	152 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the option setting of GX Works3, refer to 📖GX Works3 Operating Manual.
The amount of label usage	• Label: 0.05 K point (Word) • Latch label: 0 K point (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 📖GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
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 122 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 122 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. Designate 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.

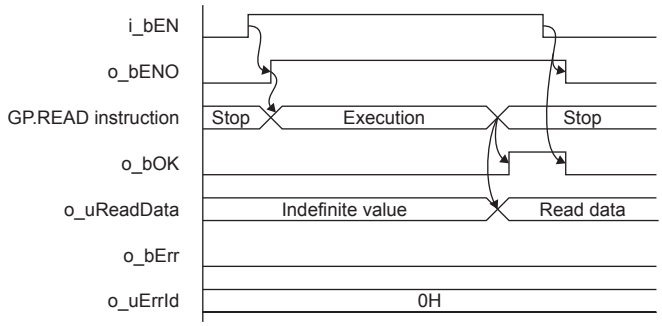


- Since the i_u2TargetAddress (Target station address) data type is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set that label value in i_u2TargetAddress (Target station address). The following program sets the target station network number 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].



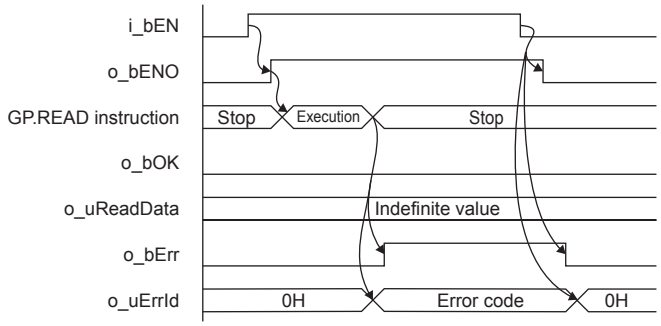
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execution command) from off → on again.
- When booting the CPU module, if the program file using this FB is designated 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, make sure 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

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

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

Refer to the MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN).

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	9.26 ms	0.717 ms	26 scans
	Read data length: 960 words	9.94 ms	1.280 ms	26 scans

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

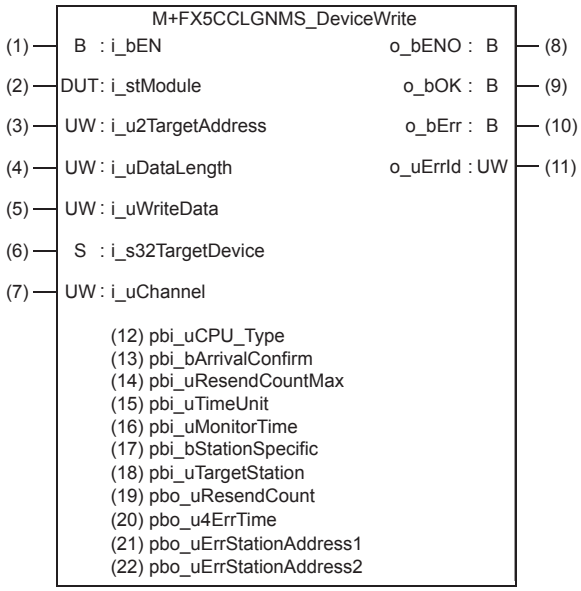
Error code

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 User's Manual (CC-Link IE TSN).

4.2 M+FX5CCLGNMS_DeviceWrite (Writing to another station device)

Overview

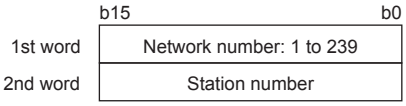
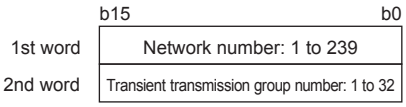
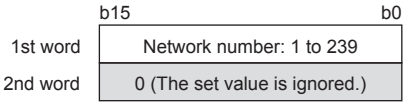
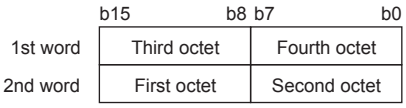
Writes data to a specified device in the programmable controller of another station.



Labels

Input label

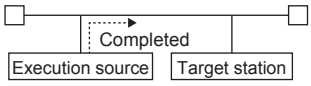
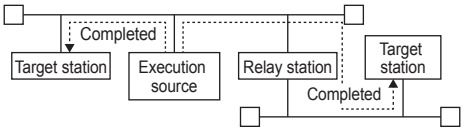
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.

No.	Variable name	Name	Data type	Range	Description
(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 the "target station specification method" is set to 0 to specify a station number  • 125: Master station • 1 to 120: Device stations ■When the "target station specification method" is set to 1 to specify a group  ■When the "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 User's Manual (CC-Link IE TSN) 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 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_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 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: 1 s • 1: 100 ms
(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 1 s • Valid range 1 to 32767: 1 to 32767 seconds ■When arrival monitoring time unit is set to 100 ms • Valid range 1 to 65535: 1 to 65535 × 100 ms
(17)	pbi_bStationSpecific	Target station address specification method	Bit	ON, OFF	Specify the target station 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: For IP address 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: For IP address 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

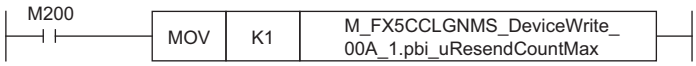
FX5U/FX5UC CPU module

Basic specifications

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

Processing

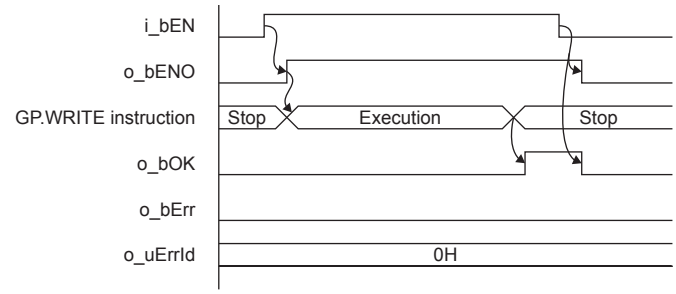
- When i_bEN (Execution command) is turned ON, data corresponding to the write data length is written from the device specified with the write data storage device into the target station write device of the specified target station address.
- If an error occurs during device write, o_bErr (Error completion) turns ON, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 129 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 122 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. Designate 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 117 M+FX5CCLGNMS_DeviceRead (Reading of another station device).

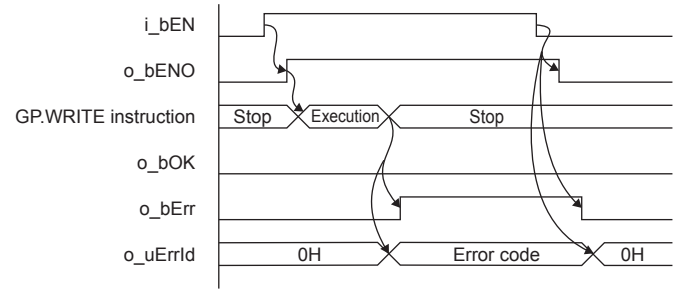
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execution command) from off → on again.
- When booting the CPU module, if the program file using this FB is designated 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, make sure 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 122 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	8.89 ms	0.703 ms	25 scans
	Write data length: 960 words	10.2 ms	1.430 ms	34 scans

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

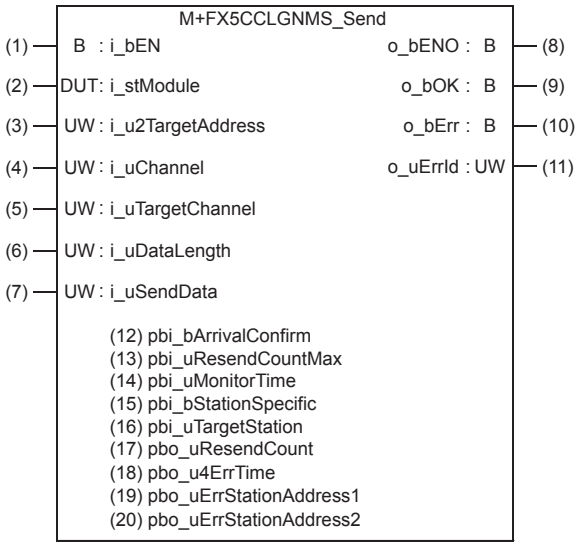
Error code

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 User's Manual (CC-Link IE TSN).

4.3 M+FX5CCLGNMS_Send (Sending data to another station)

Overview

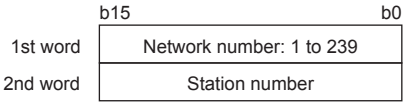
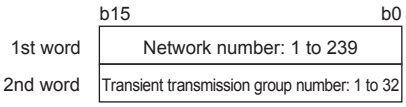
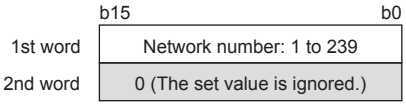
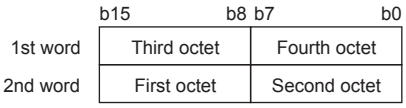
Sends data to the programmable controller of another station.



Labels

Input label

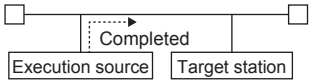
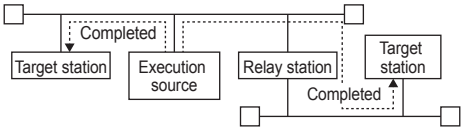
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLGN-MS.

No.	Variable name	Name	Data type	Range	Description
(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 the "target station specification method" is set to 0 to specify a station number  • 125: Master station • 1 to 120: Device stations ■When the "target station specification method" is set to 1 to specify a group  ■When the "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 send.
(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 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: For IP address 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: For IP address 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

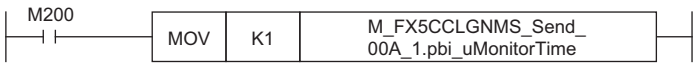
FX5U/FX5UC CPU module

Basic specifications

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

Processing

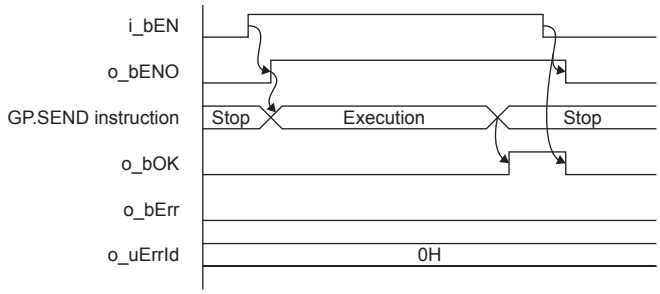
- When i_bEN (Execution command) is turned ON, data corresponding to the send data length is sent from the send data storage device to the specified target station address.
- If an error occurs while sending data, o_bErr (Error completion) turns ON, and the error code is stored in o_uErrId (Error code). For the error code, refer to ☞ Page 136 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 122 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. Designate 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 117 M+FX5CCLGNMS_DeviceRead (Reading of another station device).

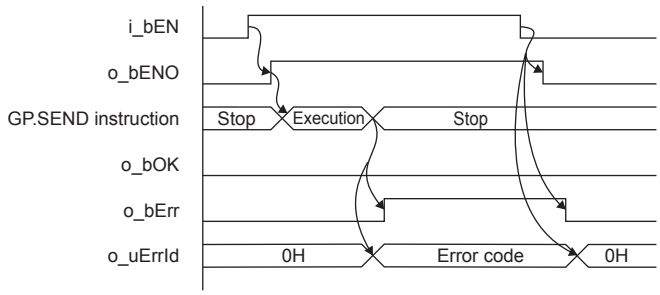
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execution command) from off → on again.
- When booting the CPU module, if the program file using this FB is designated 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, make sure 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 122 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	5.36 ms	0.655 ms	10 scans
	Send data length: 960 words	7.56 ms	1.390 ms	17 scans

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

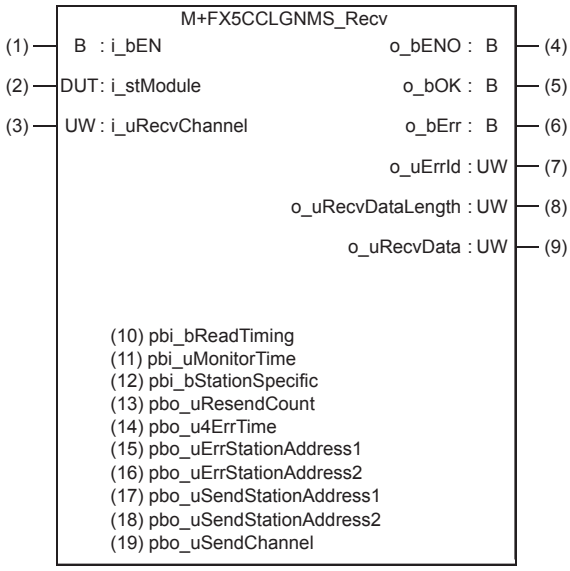
Error code

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 User's Manual (CC-Link IE TSN).

4.4 M+FX5CCLGNMS_Recv (Receiving from another station data)

Overview

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	Received 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 time to monitor until completion of the process (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: For IP address 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: For IP address 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: For IP address 192.168.1.2 • 0102H

No.	Variable name	Name	Data type	Default value	Description
(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: For IP address 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

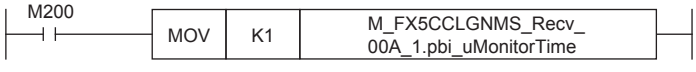
FX5U/FX5UC CPU module

Basic specifications

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

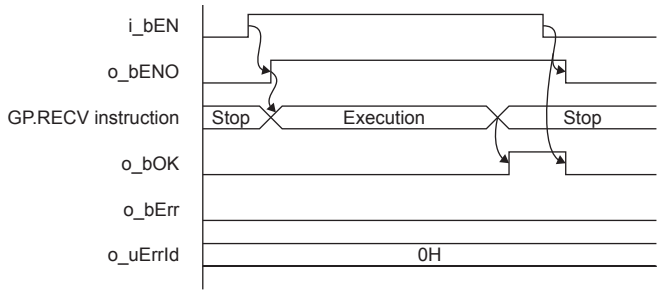
Processing

- 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 141 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 122 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. Designate 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.



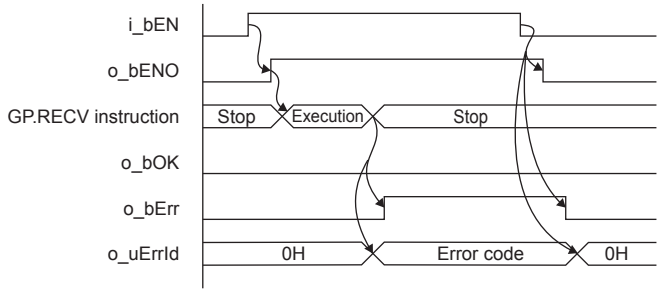
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execution command) from off → on again.
- When booting the CPU module, if the program file using this FB is designated 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, make sure that the received 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 122 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	0.71 ms	0.643 ms	1 scan
	Received data length: 960 words	1.75 ms	1.550 ms	2 scans

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

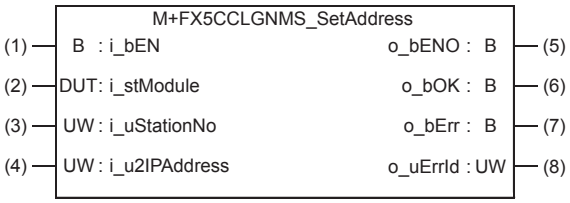
Error code

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 User's Manual (CC-Link IE TSN).

4.5 M+FX5CCLGNMS_SetAddress (Own station number/IP address setting)

Overview

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	Specifies 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: For IP address 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 normally.
(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

FX5U/FX5UC CPU module

Basic specifications

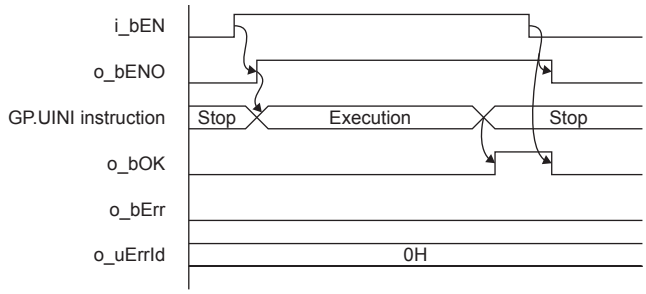
Item	Description
Language	Ladder diagram
Number of steps	89 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the option setting of GX Works3, refer to 📖GX Works3 Operating Manual.
The amount of label usage	• Label: 0.02 K point (Word) • Latch label: 0 K point (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 📖GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
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 145 Error code.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 122 Parameter setting.

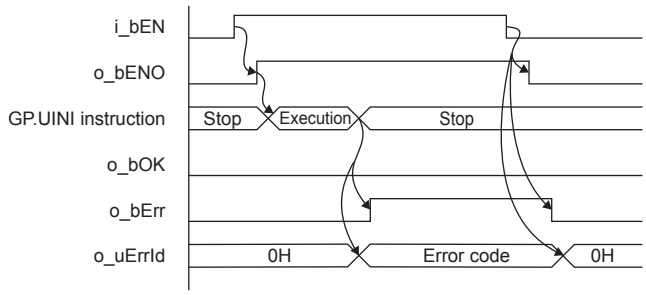
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execution command) from off → 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 122 Parameter setting.

Performance value

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

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

Error code

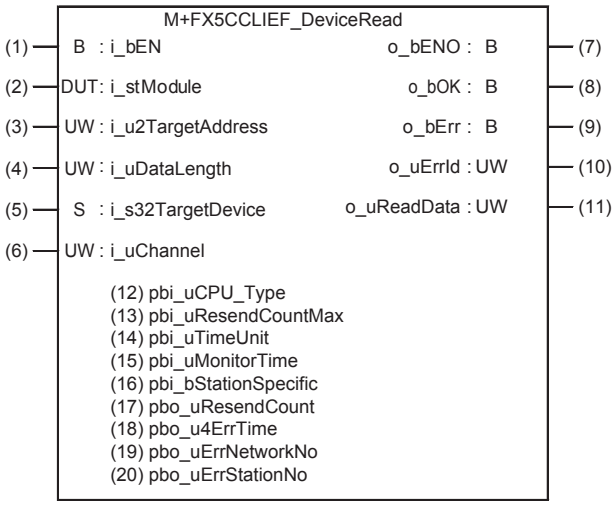
Error code (hexadecimal)	Description	Action
C000H to CFFFH D000H to DFFFH E000H to EFFFH	This error code is the same as the error code that occurs with the own station number and IP address setting (GP.UINI) instruction.	Refer to the MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN).

5 CC-Link IE Field Network MODULE FB

5.1 M+FX5CCLIEF_DeviceRead (Another station device reading)

Overview

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. b15 b0 1st word: Network number: 1 to 239 2nd word: Station number Station number of Ethernet or CC-Link IE Controller Network • 1 to 120 Station number of CC-Link IE Field Network • 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 User's Manual (CC-Link IE) 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	Stores the error code that occurred in the FB.
(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 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: 10 s • 1 to 32767: 1 to 32767 s
(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. 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

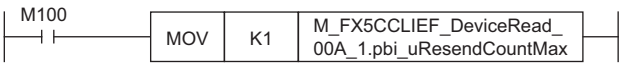
MELSEC iQ-F series

Basic specifications

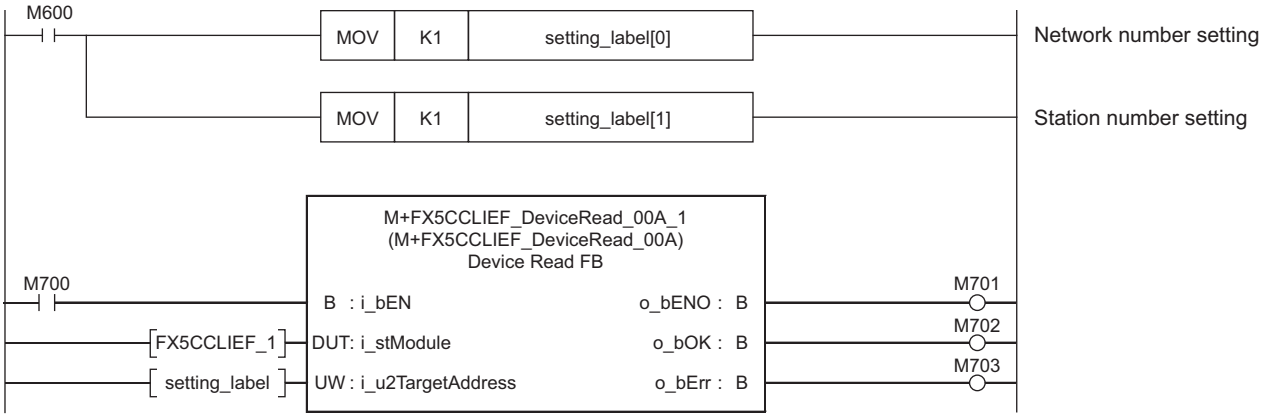
Item	Description
Language	Ladder diagram
Number of steps	113 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to 📖GX Works3 Operating Manual.
The amount of label usage	• Label: 0.05 K point (Word) • Latch label: 0 K point (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 📖GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
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). Refer to ☞ Page 150 Error code for details on the error codes.
- 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 User's Manual (CC-Link IE).
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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.

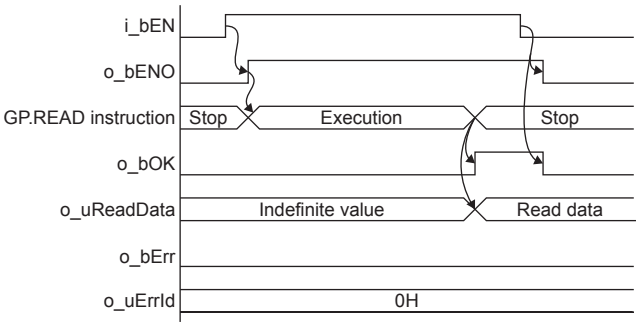


- Since the data type of i_u2TargetAddress (target station address) is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set the value of the label in i_u2TargetAddress (target station address). The following program is designed to set the network 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).



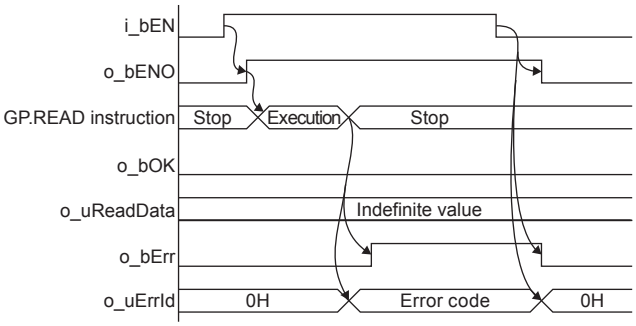
Timing chart of I/O signals

■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 G(P).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. If this happens, turn i_bEN (Execute command) from off to 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, make sure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation.

Parameter setting

To set the CC-Link IE field network, set the parameters on GX Works3.

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

For the detailed setting procedure, refer to MELSEC iQ-F FX5 User's Manual (CC-Link IE).

Performance value

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

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

*2 The labels in the standard area are used.

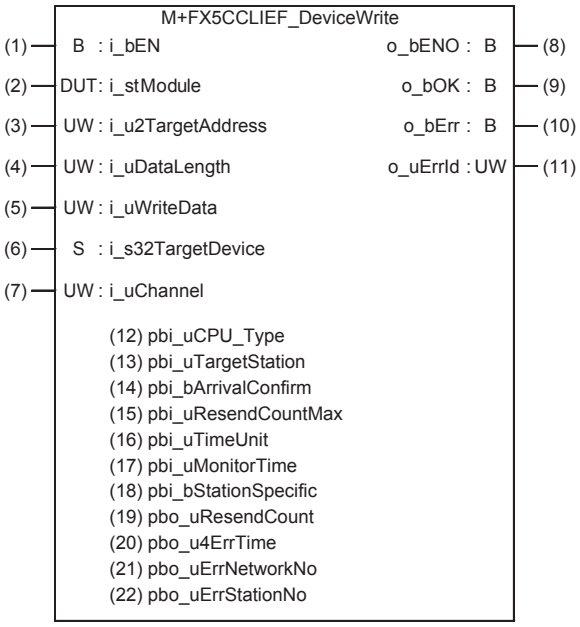
Error code

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 User's Manual (CC-Link IE)

5.2 M+FX5CCLIEF_DeviceWrite (Another station device writing)

Overview

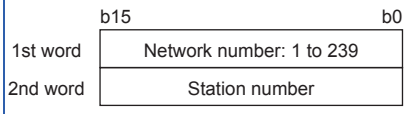
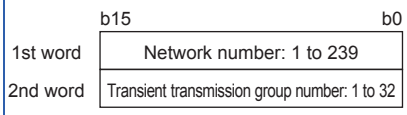
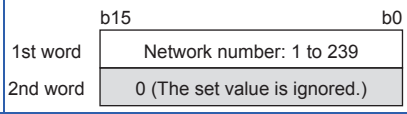
Writes data to a specified device in the programmable controller of another station.



Labels

Input label

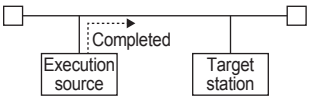
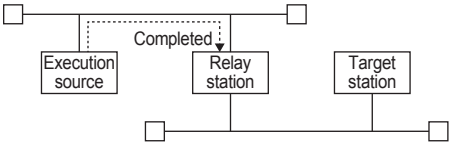
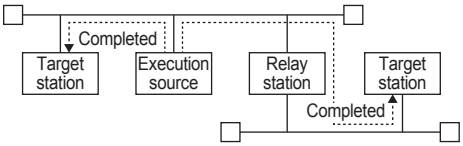
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.

No.	Variable name	Name	Data type	Range	Description
(3)	i_u2TargetAddress	Target station address	Word [Unsigned]/ Bit String [16-bit]	—	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 Station number of CC-Link IE Field Network • 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	—	Specify the head device of the target station to which data is to be written. Refer to the MELSEC iQ-F FX5 User's Manual (CC-Link IE) 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 in 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	Default value	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 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 the 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	Default value	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: 10 s • 1 to 32767: 1 to 32767 s
(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. 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

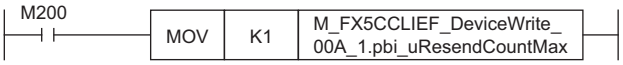
MELSEC iQ-F series

Basic specifications

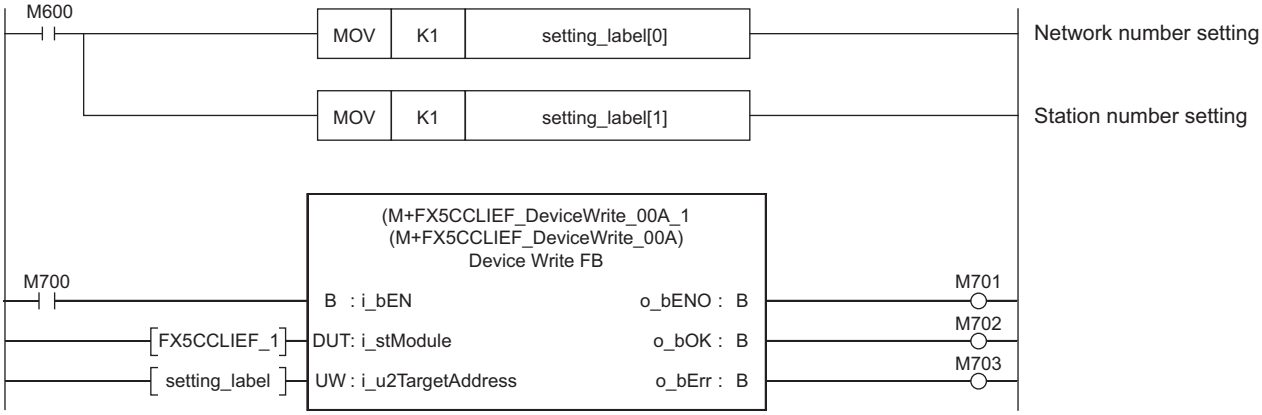
Item	Description
Language	Ladder diagram
Number of steps	136 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual.
The amount of label usage	• Label: 0.05 K point (Word) • Latch label: 0 K point (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 GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
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). Refer to ☞ Page 156 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 150 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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.

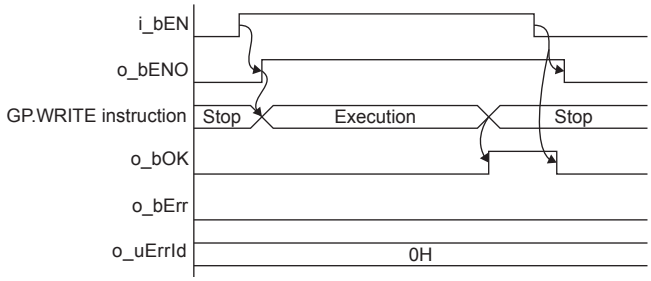


- Since the data type of i_u2TargetAddress (target station address) is an array, the value cannot be set as a constant. Create a global label for setting, and create a program to set the value of the label in i_u2TargetAddress (target station address). For the setting procedure, refer to ☞ Page 146 M+FX5CCLIEF_DeviceRead (Another station device reading).



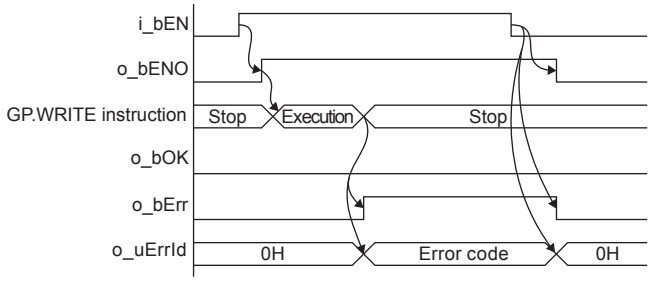
Timing chart of I/O signals

■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 G(P).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. If this happens, turn i_bEN (Execute command) from off to 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, make sure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 150 Parameter setting.

Performance value

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

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

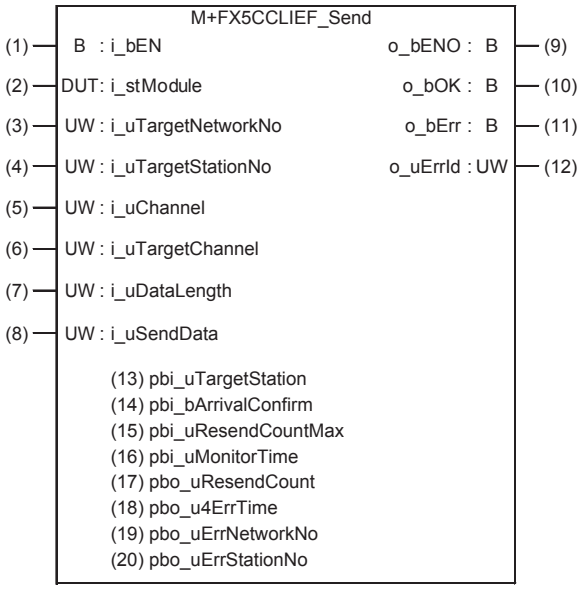
Error code

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 User's Manual (CC-Link IE)

5.3 M+FX5CCLIEF_Send (Another station device sending)

Overview

Sends data to the programmable controller of another station.



Labels

Input label

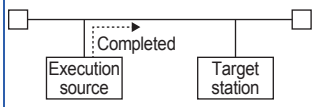
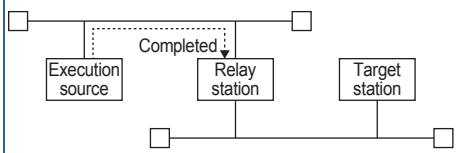
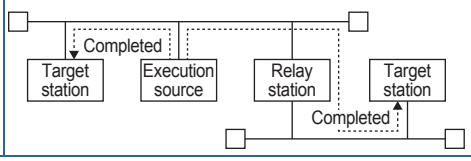
No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specify the module label of the FX5-CCLIEF.
(3)	i_uTargetNetworkNo	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 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	Stores the error code that occurred in the FB.

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 the 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: 10 s • 1 to 32767: 1 to 32767 s
(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. 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

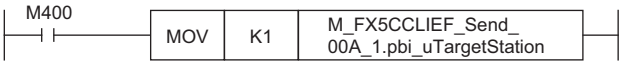
MELSEC iQ-F series

Basic specifications

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

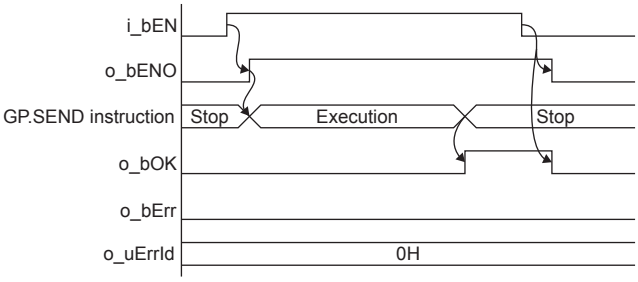
Processing

- 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). Refer to ☞ Page 162 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 150 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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.



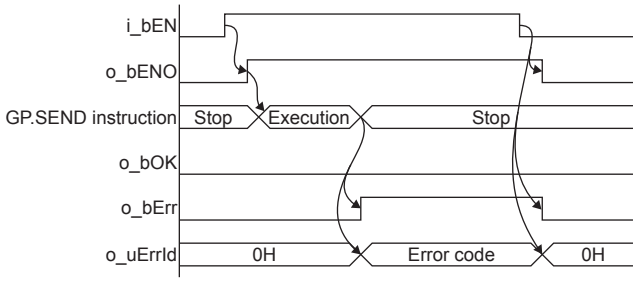
Timing chart of I/O signals

■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 G(P).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. If this happens, turn i_bEN (Execute command) from off to 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, make sure that the target station address and own station channel do not overlap.
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 150 Parameter setting.

Performance value

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

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

*2 The labels in the standard area are used.

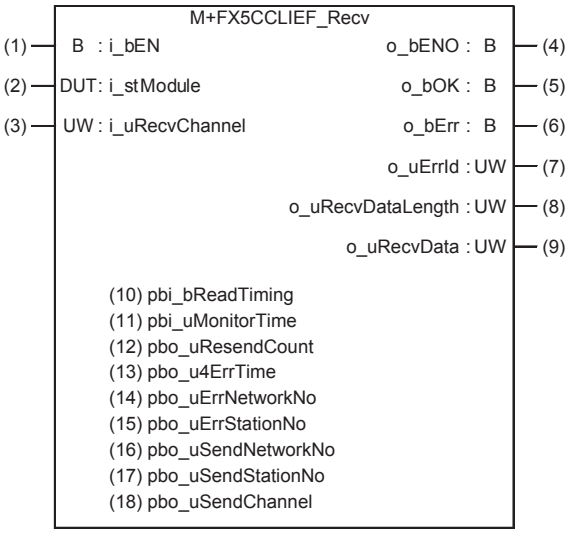
Error code

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 User's Manual (CC-Link IE)

5.4 M+FX5CCLIEF_Recv (Another station device receiving)

Overview

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	Stores the error code that occurred in the FB.
(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	Default value	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, 1 to 32767	Specify the time to monitor until completion of the process. If the processing is not completed within the monitoring time, it will end with an error. • 0: 10 s • 1 to 32767: 1 to 32767 s
(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. 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. 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

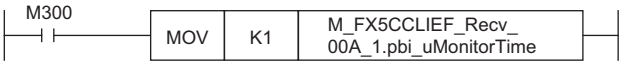
MELSEC iQ-F series

Basic specifications

Item	Description
Language	Ladder diagram
Number of steps	132 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual.
The amount of label usage	• Label: 0.04 K point (Word) • Latch label: 0 K point (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 GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
FB dependence	No dependence
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)

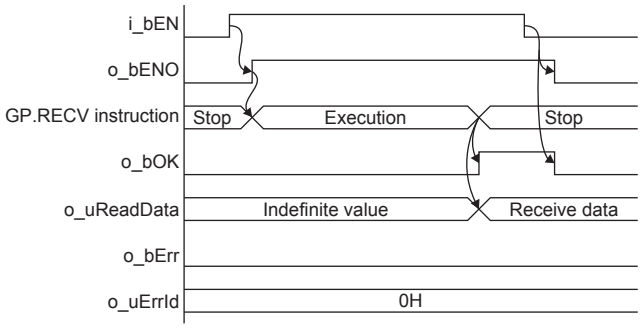
Processing

- 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). Refer to ☞ Page 167 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 150 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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.



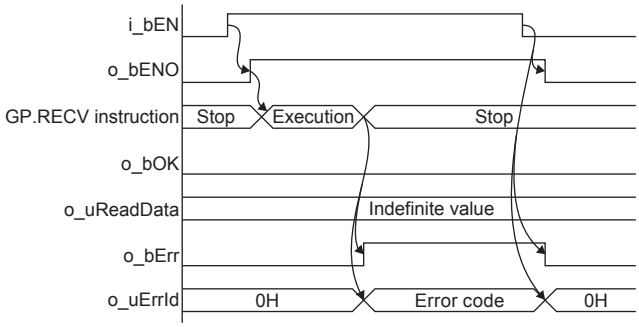
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execute command) from off to 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, make sure that the receive data storage channel do not overlap.
- Every input must be provided with a value for proper FB operation.

Parameter setting

For the parameter setting, refer to ☞ Page 150 Parameter setting.

Performance value

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

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

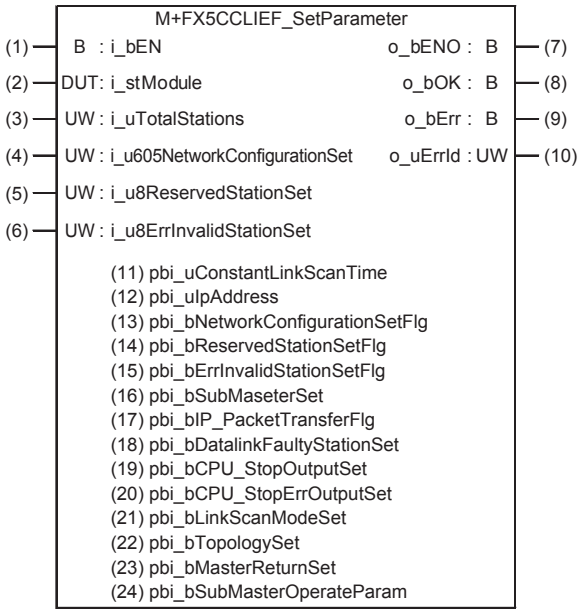
Error code

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 User's Manual (CC-Link IE)

5.5 M+FX5CCLIEF_SetParameter (Parameter setting)

Overview

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 slave 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	Stores the error code that occurred in the FB.

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 the operating status of a CPU module is STOP. • 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

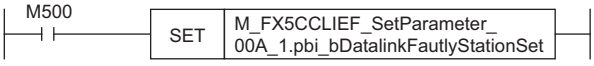
MELSEC iQ-F series

Basic specifications

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

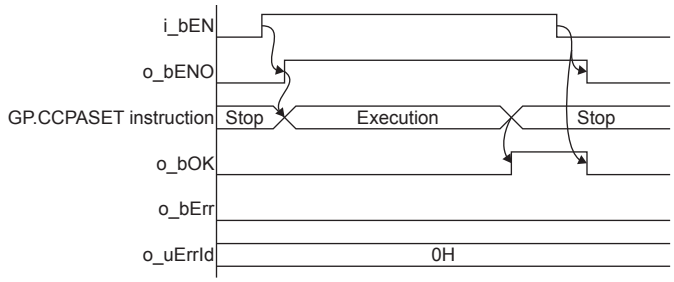
Processing

- 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). Refer to ☞ Page 172 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 150 Parameter setting.
- To set or monitor public labels, add a program for setting or monitoring as shown below. Designate 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).



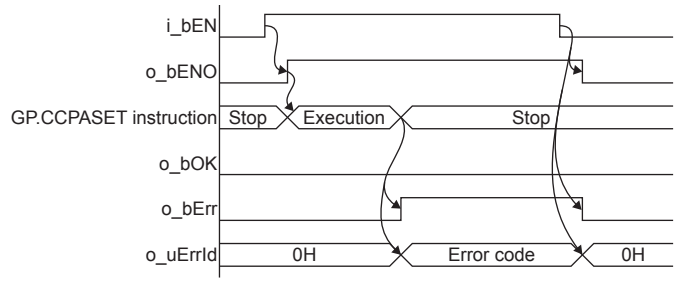
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execute command) from off to 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 150 Parameter setting.

Performance value

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

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

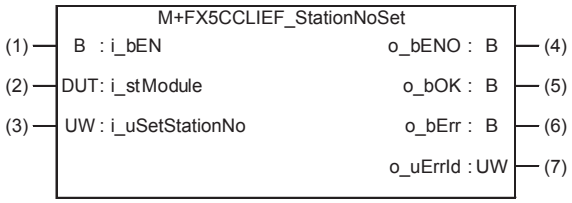
Error code

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 User's Manual (CC-Link IE)

5.6 M+FX5CCLIEF_StationNoSet (Own station number setting)

Overview

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	Specifies 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	Stores the error code that occurred in the FB.

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

MELSEC iQ-F series

Basic specifications

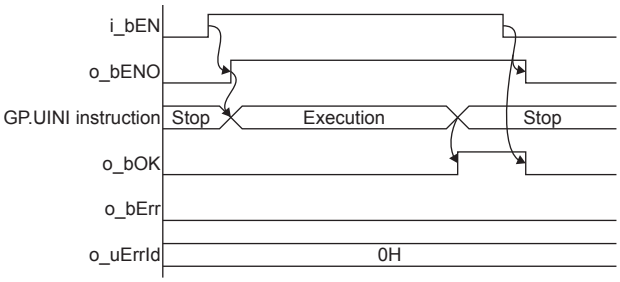
Item	Description
Language	Ladder diagram
Number of steps	77 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to 📖GX Works3 Operating Manual.
The amount of label usage	• Label: 0.02 K point (Word) • Latch label: 0 K point (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 📖GX Works3 Operating Manual.
The number of index register usage	• Index register: 0 point • Long index register: 0 point
The amount of file register usage	0 point
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). Refer to ☞ Page 176 Error code for details on the error codes.
- Set the module parameters in GX Works3 in accordance with the connected equipment and system. For the module parameters, refer to ☞ Page 150 Parameter setting.

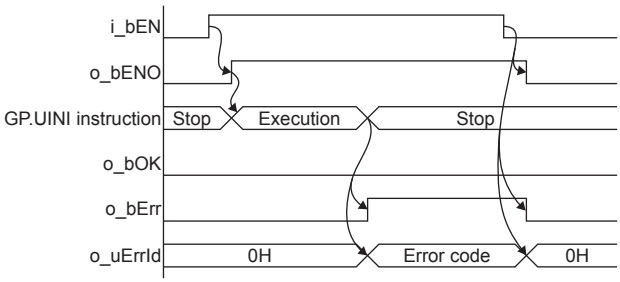
Timing chart of I/O signals

■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. If this happens, turn i_bEN (Execute command) from off to 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 150 Parameter setting.

Performance value

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

*1 When the program capacity is set to 128 K 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 User's Manual (CC-Link IE)

6 EXAMPLE OF USE

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

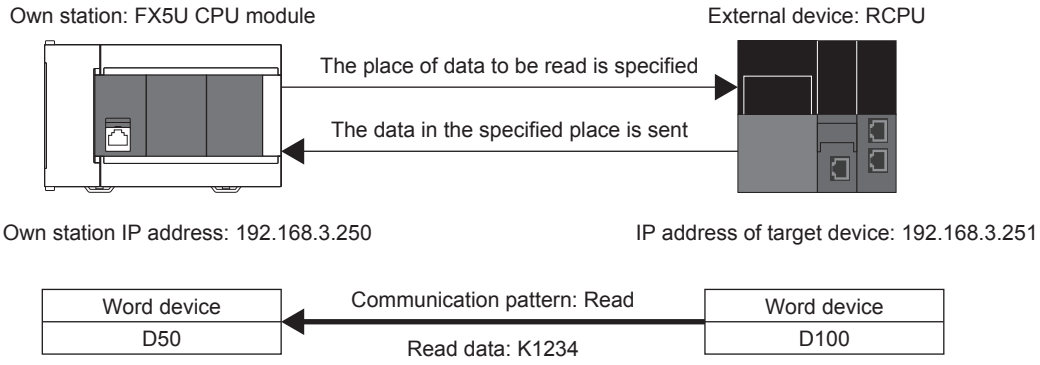
Use M+FX5UCPU-EN_DeviceRead_IP (Reading of SLMP compatible device) to read the device data specified by the target device.

System configuration

Refer to ☞ Page 14 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

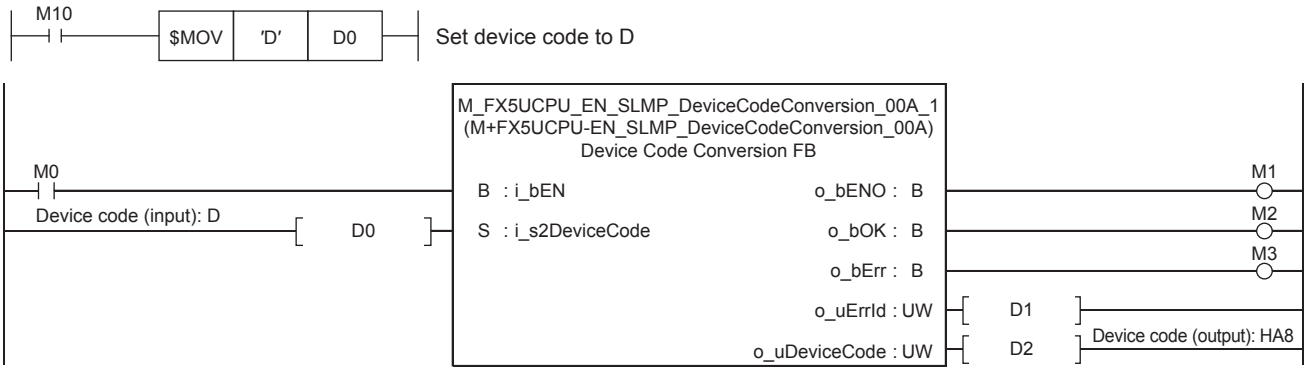
The own station IP address and SLMP communication settings are set using GX Works3. Refer to MELSEC iQ-F FX5 User's Manual (Ethernet Communication) for details on the setting methods.

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 SLMP communication FB device code). In this example, the data is read from D100 of the target device, so the device code "D" is converted into a binary code. Refer to ☞ Page 62 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Device code reading of SLMP communication FB) for details on FB.



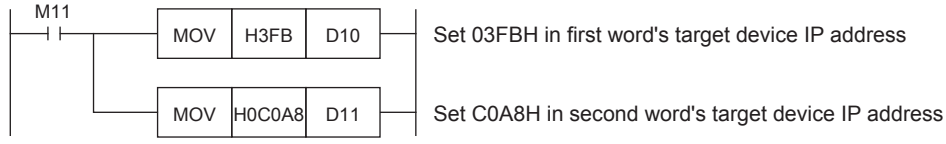
• Setting the IP address of the target device

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

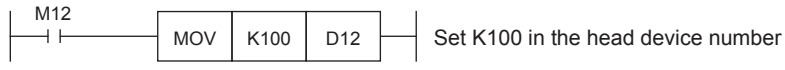
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



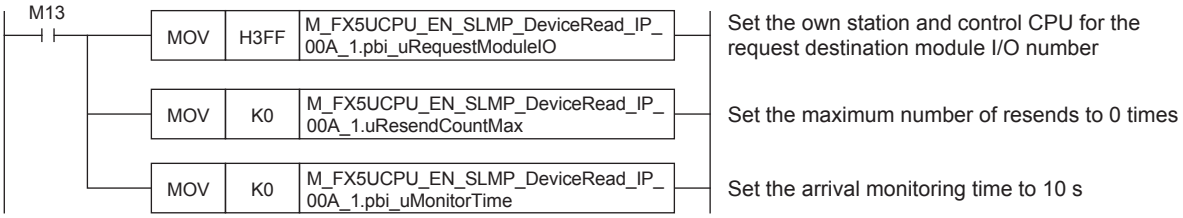
• Setting the head device number

Set the head device number of the device to read in D12.



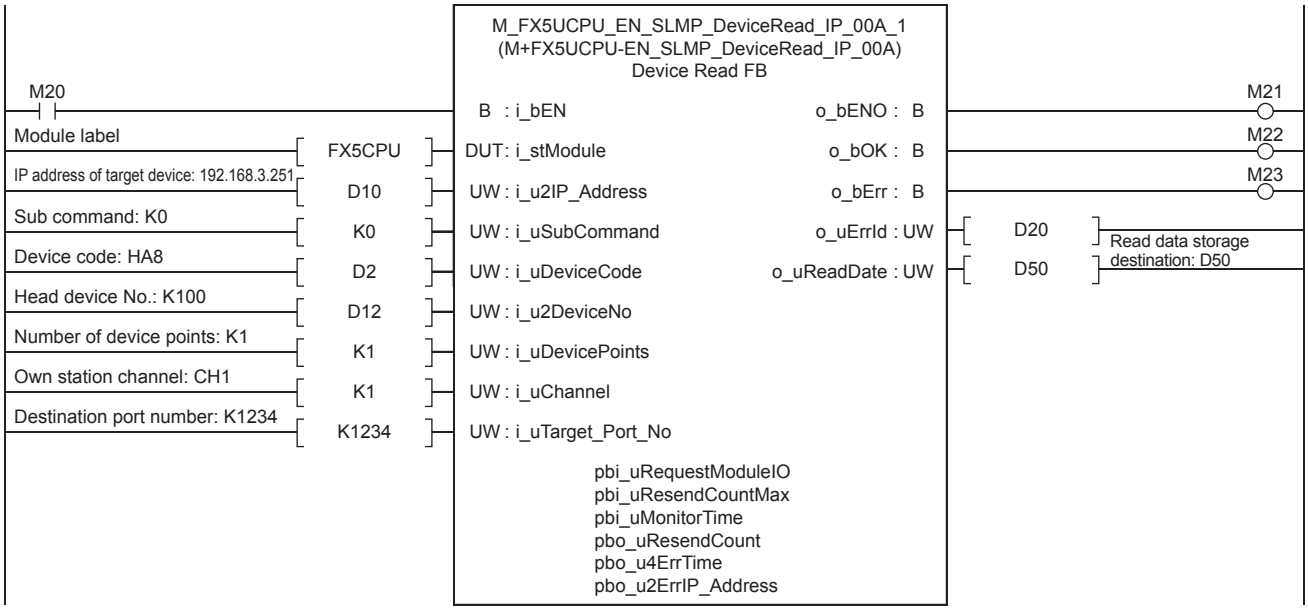
• Setting the operation parameter

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.



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

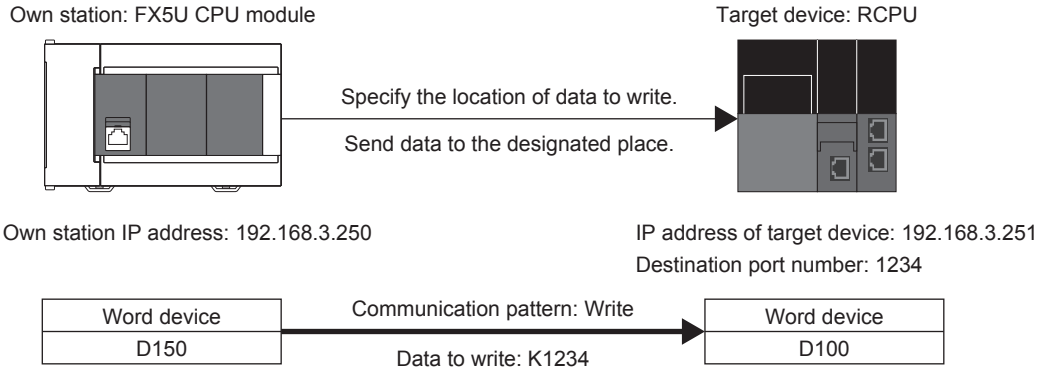
The data is written to the device specified by the target device using M+FX5UCPU-EN_DeviceWrite_IP (Writing to SLMP compatible device).

System configuration

Refer to ☞ Page 14 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

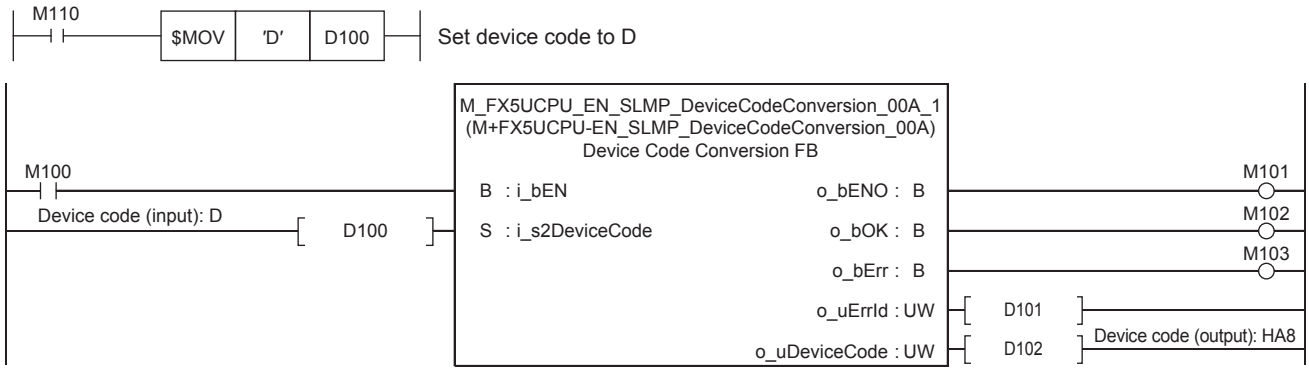
The own station IP address and SLMP communication settings are set using GX Works3. Refer to MELSEC iQ-F FX5 User's Manual (Ethernet Communication) for details on the setting methods.

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 in with M+FX5UCPU-EN_DeviceWrite_IP (Writing to SLMP compatible device).

• Convert the device code to the binary code.

With M+FX5UCPU-EN_DeviceWrite_IP (Writing to SLMP compatible device), the device to write is designated with a binary code. Therefore, the device to write is converted into binary code with M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Reading of SLMP communication FB device code). In this example, the data is written into D100 of the target device, so the device code "D" is converted into binary code. Refer to ☞ Page 62 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Device code reading of SLMP communication FB) for details on FB.



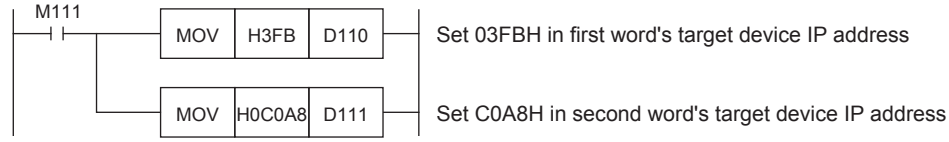
• Setting the IP address of the target device

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

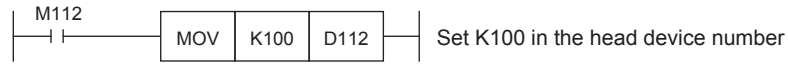
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



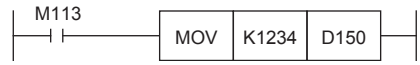
• Setting the head device number

Set the head device number of the device to be written to D112.



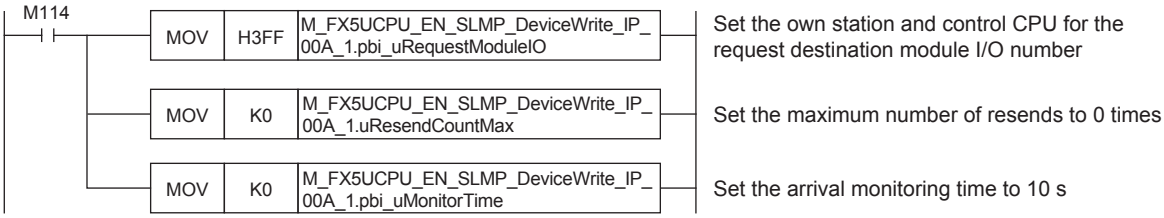
• Setting the write data storage destination

Set the data K1234 to be written to D150.



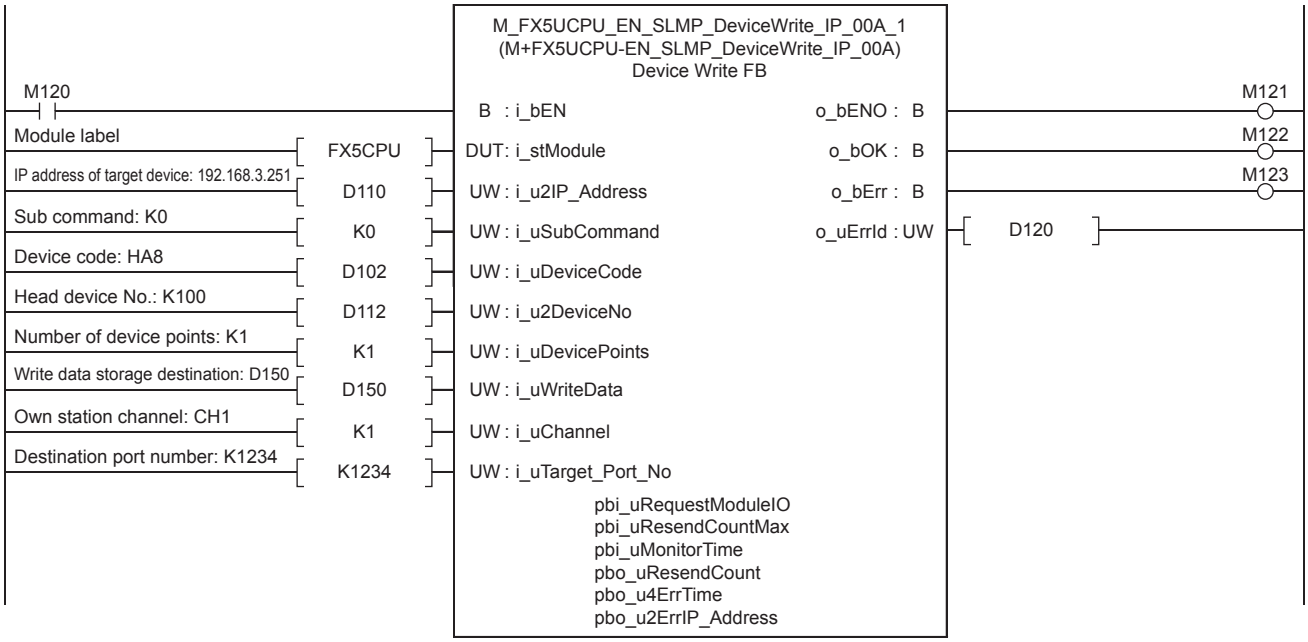
• Setting the operation parameter

Set the operation parameter to use in M+FX5UCPU-EN_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_DeviceWrite_IP (Writing to SLMP compatible device) FB.



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

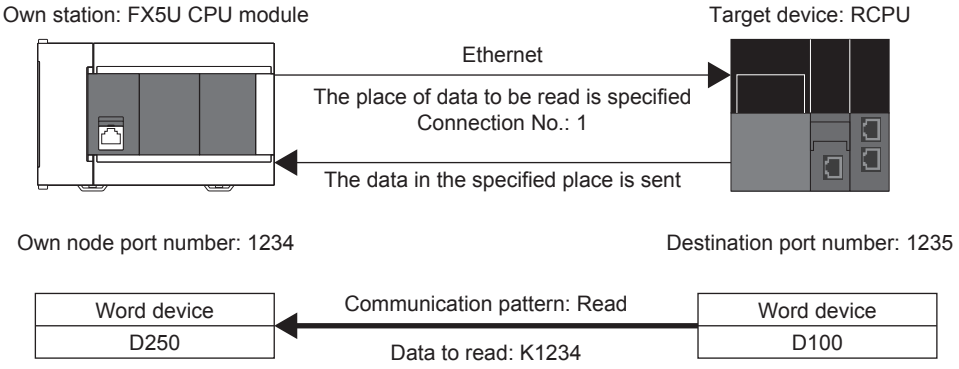
The data in the device specified by the target device is read using M+FX5UCPU-EN_DeviceRead_Active (Reading of SLMP compatible device with Active connection).

System configuration

Refer to ☞ Page 14 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

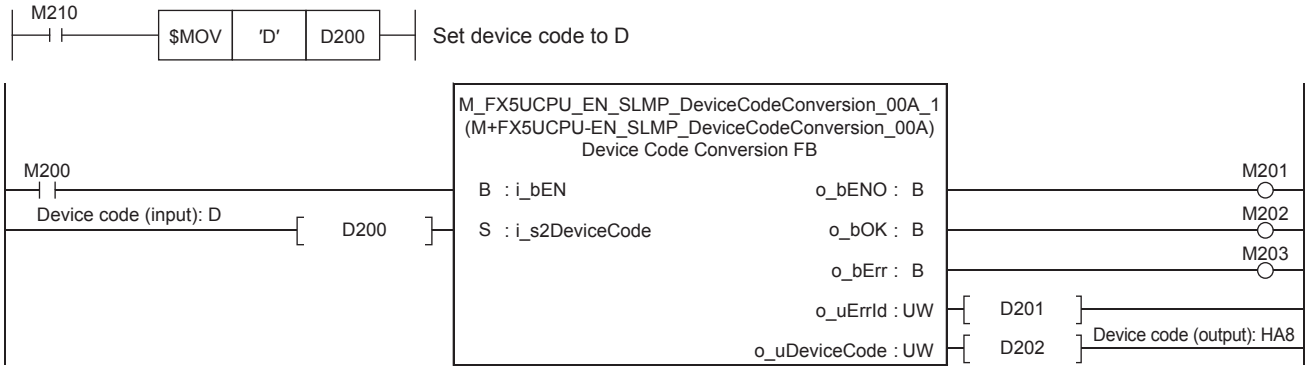
No parameter setting is required to use this FB.

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 SLMP communication FB device code). In this usage example, D100 of the target device is read so the device code "D" is converted into a binary code. Refer to ☞ Page 62 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Device code reading of SLMP communication FB) for details on FB.



• Setting the head device number

Set the head device number of the device to read in D212.

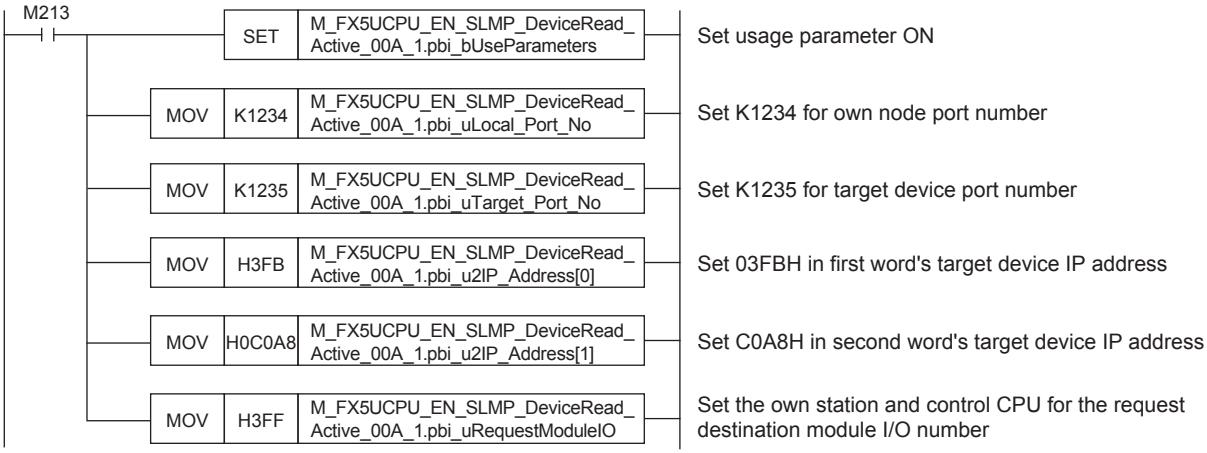
• Setting the operation parameter

In this usage example, the connection is opened with the operation parameter settings. Therefore, pbi_bUseParameters (Usage parameters) is set ON for this. When OFF, the opening process settings are completed with GX Works3. Refer to📖 MELSEC iQ-F FX5 User's Manual (Ethernet Communication) for details on the settings. 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

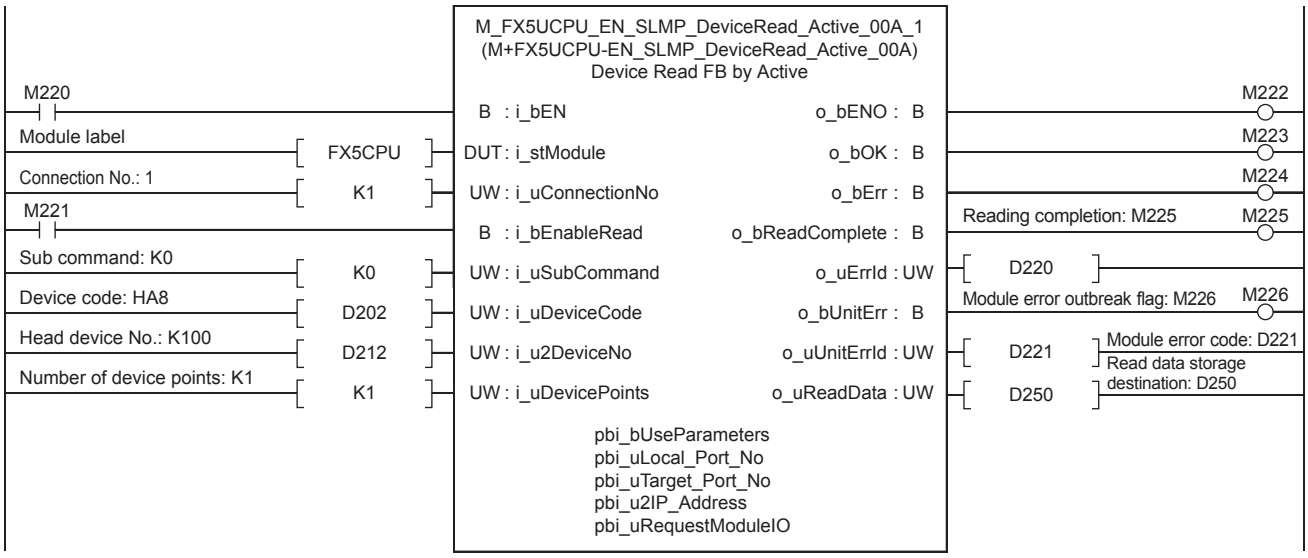
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



• Setting and executing 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.



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

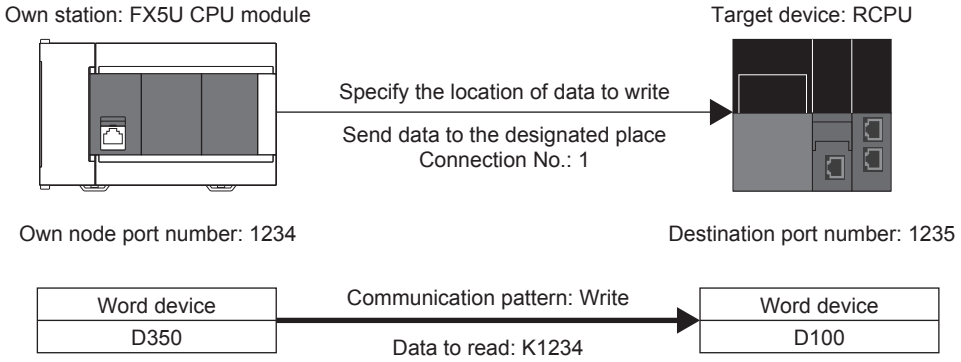
The data is written to the device specified with the target device using M+FX5UCPU-EN_DeviceWrite_Active (Writing to SLMP target device with Active connection).

System configuration

Refer to ☞ Page 14 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

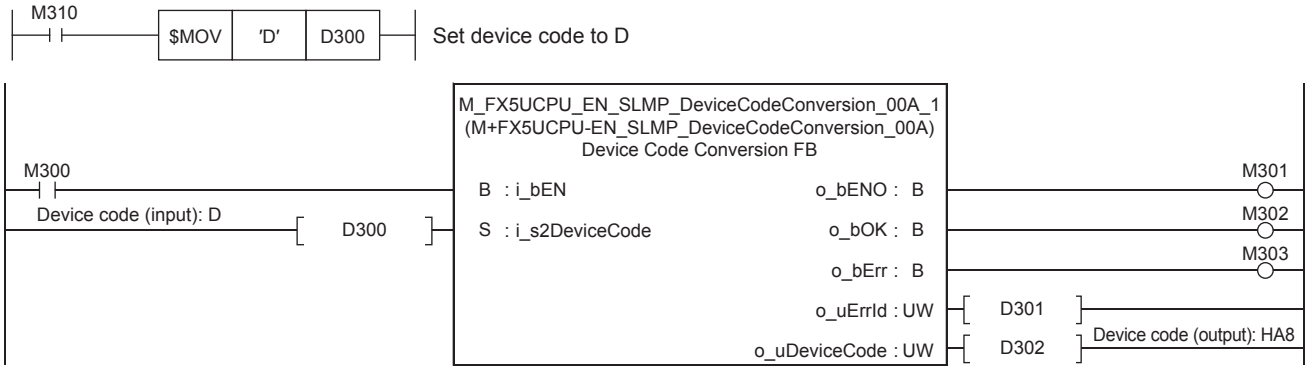
No parameter setting is required to use this FB.

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 SLMP communication FB device code). In this example, the data is written into D100 of the target device, so the device code "D" is converted into binary code. Refer to ☞ Page 62 M+FX5UCPU-EN_SLMP_DeviceCodeConversion (Device code reading of SLMP communication FB) for details on 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.

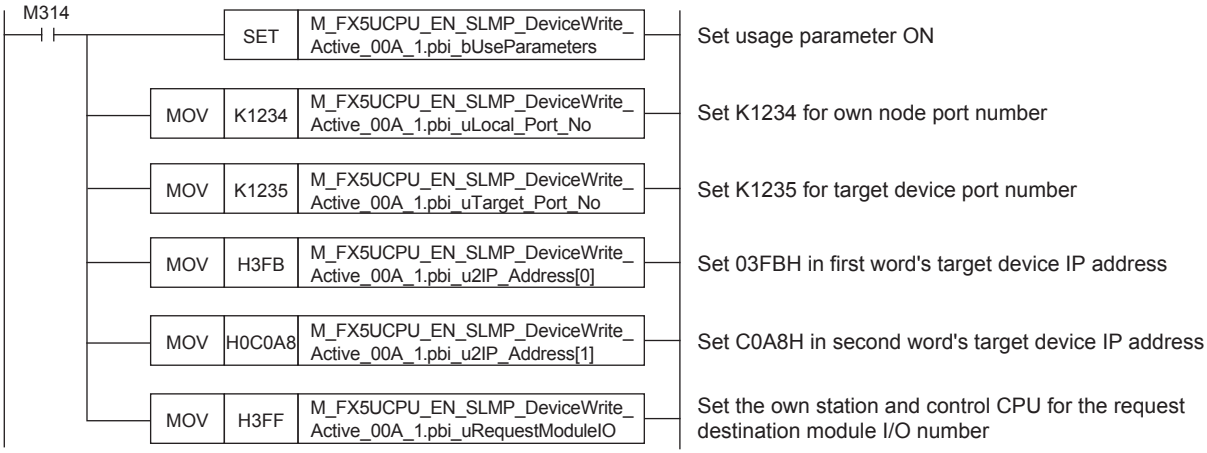
• Setting the operation parameter

In this usage example, the connection is opened with the operation parameter settings. Therefore, pbi_bUseParameters (Usage parameters) is set ON for this. When OFF, the opening process settings are completed with GX Works3. Refer to📖 MELSEC iQ-F FX5 User's Manual (Ethernet Communication) for details on the settings. 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

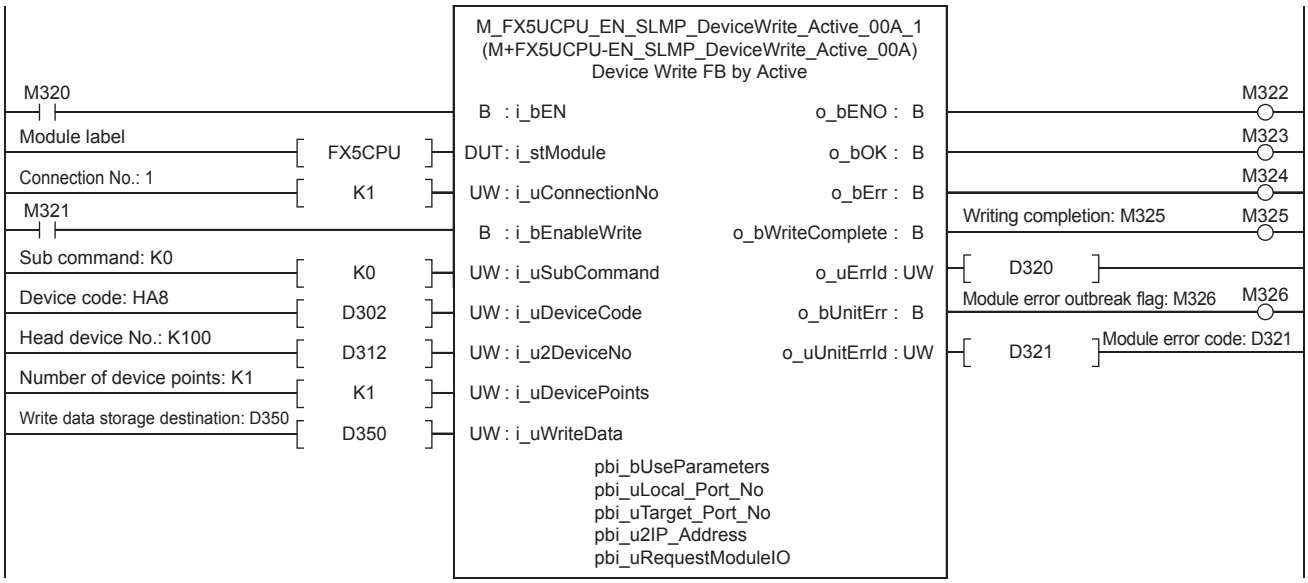
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



• Setting and executing writing to 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.



6.5 M+FX5CCLIEF_DeviceRead (Reading of another station device)

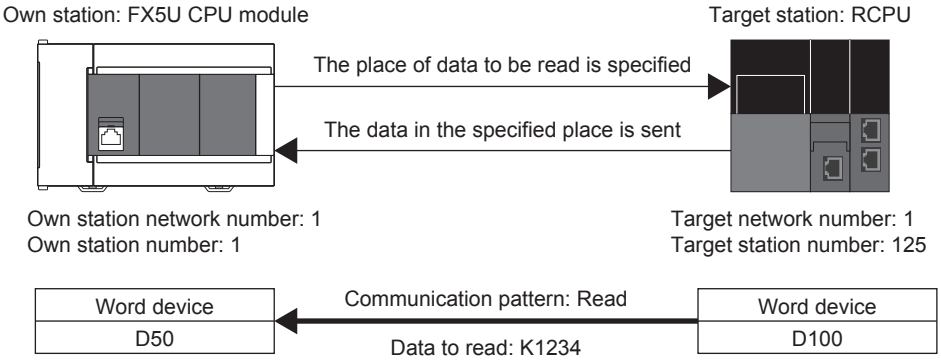
The data of the specified device in the target station is read using M+FX5CCLIEF_DeviceRead (Reading of another station device).

System configuration

Refer to ☞ Page 14 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. Refer to 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE) for details on the setting methods.

• Station number setting

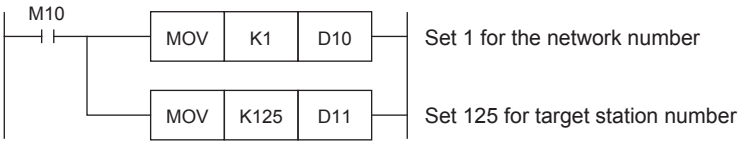
The own station number is set with GX Works3 or with M+FX5CCLIEF_StationNoSet (Own station number setting). Refer to 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE) for details on setting with GX Works3. Refer to ☞ Page 173 M+FX5CCLIEF_StationNoSet (Own station number setting) for details on setting with 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).

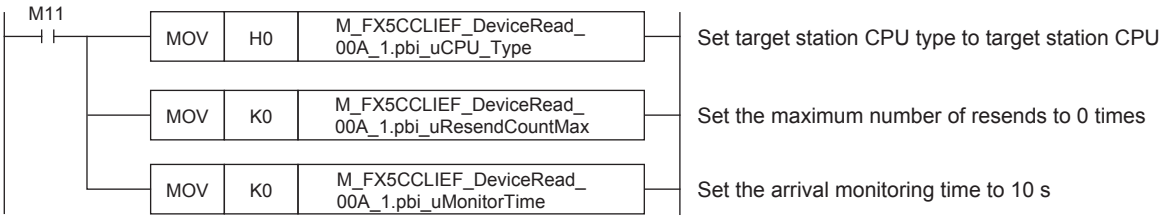
• Setting the network number and station number

Set the network number and station number of the target station for reading the value.



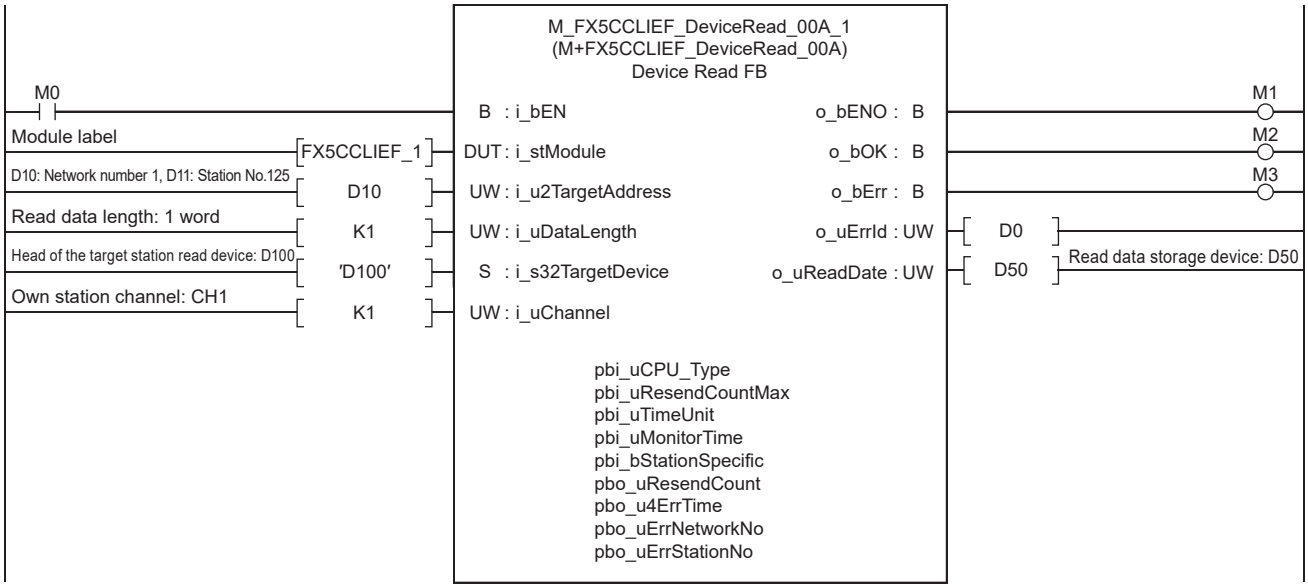
• Setting the operation parameter

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.



6.6 M+FX5CCLIEF_DeviceWrite (Writing to another station device)

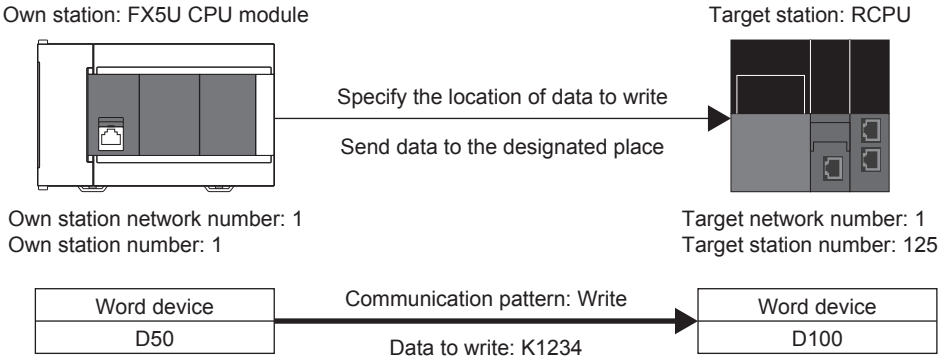
Data is written to the designated device of the target station using M+FX5CCLIEF_DeviceWrite (Writing to another station device).

System configuration

Refer to ☞ Page 14 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. Refer to 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE) for details on the setting methods.

• Station number setting

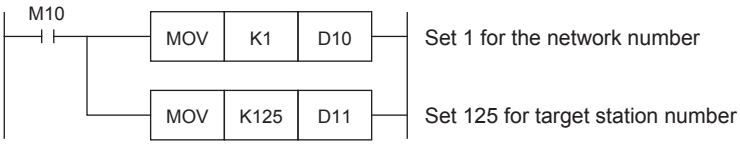
The own station number is set with GX Works3 or with M+FX5CCLIEF_StationNoSet (Own station number setting). Refer to 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE) for details on setting with GX Works3. Refer to ☞ Page 173 M+FX5CCLIEF_StationNoSet (Own station number setting) for details on setting with 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.

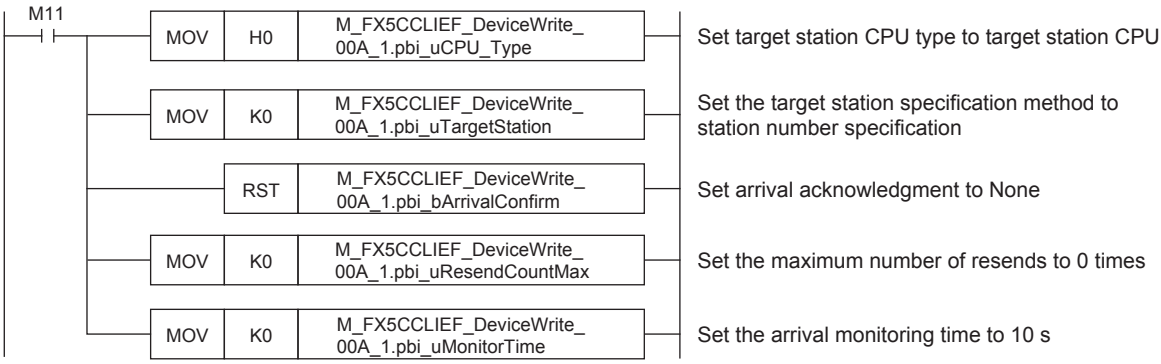


• Setting the write data storage device

Set the data K1234 to be written to D50.

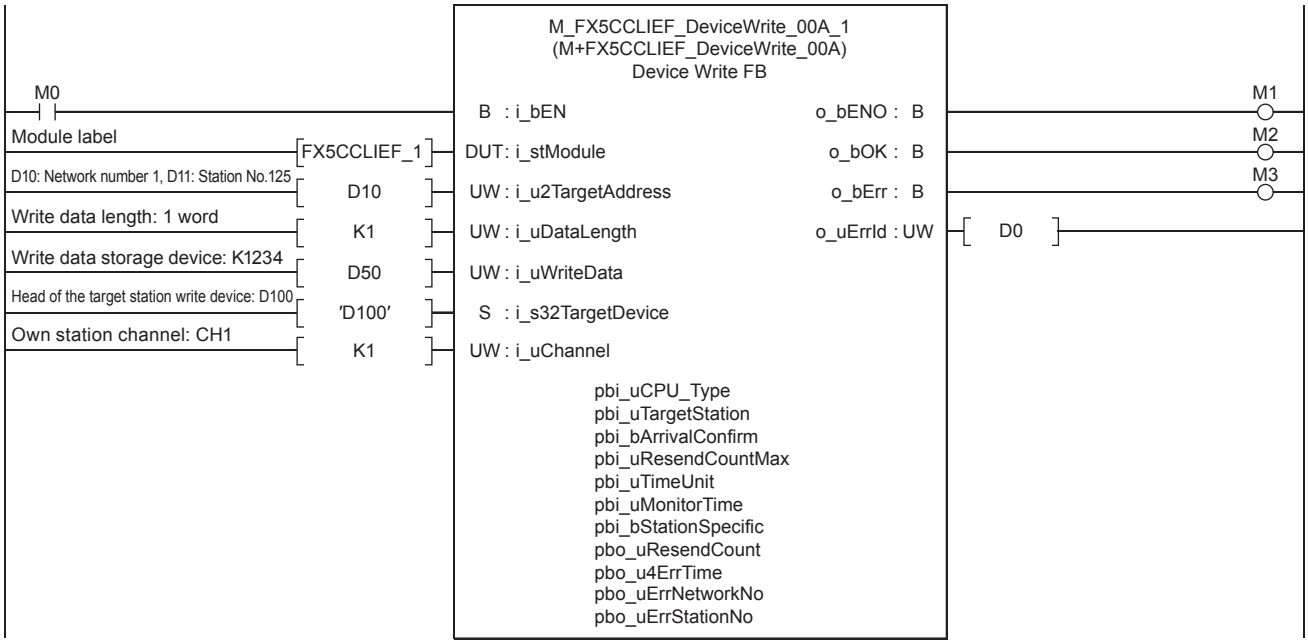
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLIEF_DeviceWrite (Writing to another station device).



• 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.



6.7 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

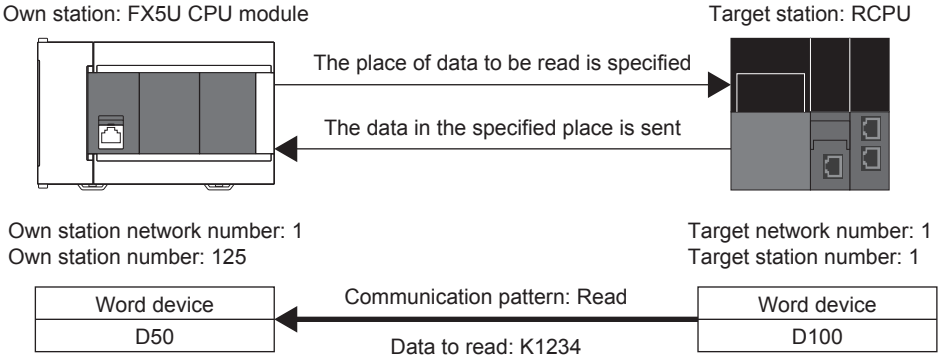
System configuration

Refer to ☞ Page 14 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 MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) for details on the setting method.

• Station number setting

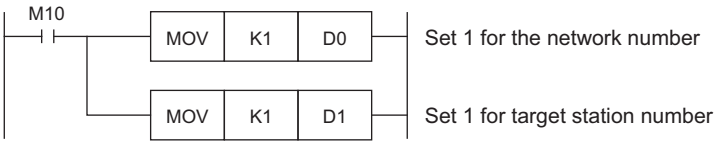
The own station number is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) for details on setting with GX Works3. Refer to ☞ Page 142 M+FX5CCLGNMS_SetAddress (Own station number/IP address setting) for details 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).

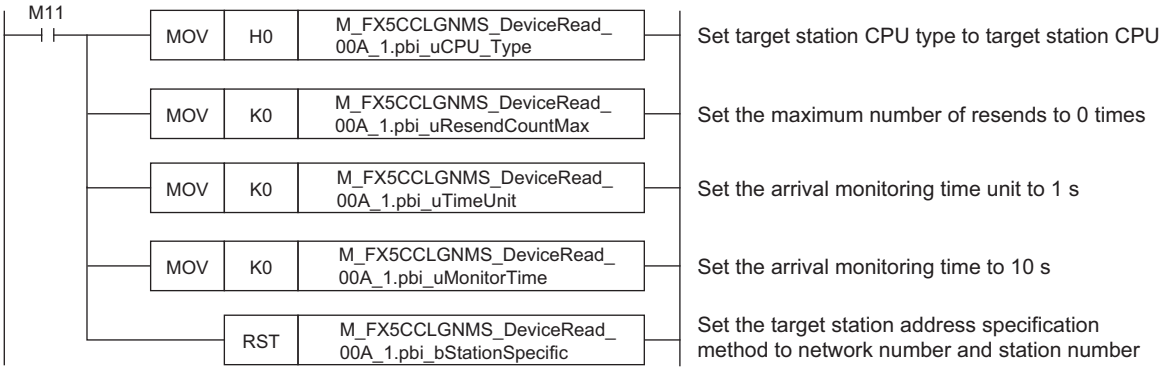
• Setting the network number and target station number

Set the network number and station number of the target station for reading the value.



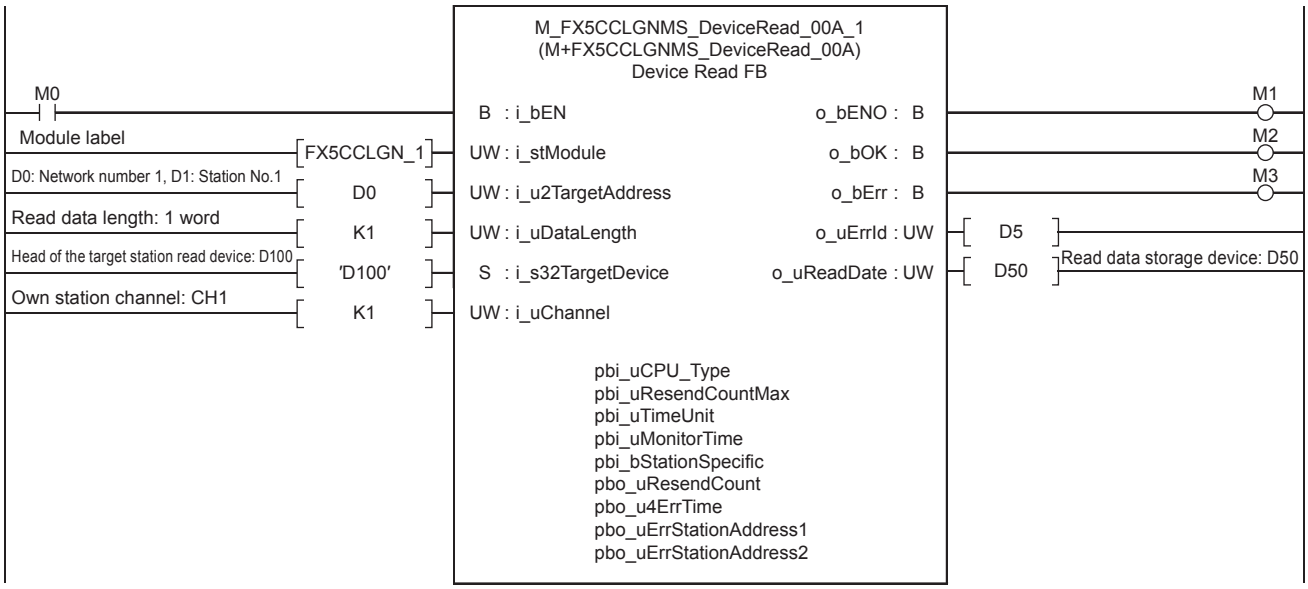
• Setting the operation parameter

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

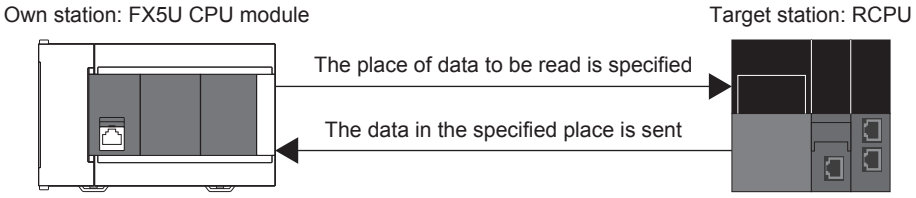
System configuration

Refer to ☞ Page 14 System Configuration.

Outline of example of program

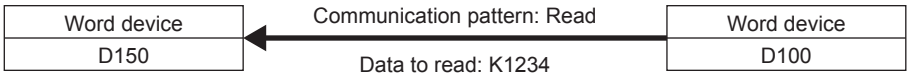
The value stored in device D100 of the target station is read to device D150 in the own station.

The target station is specified with the IP address.



Own station IP address: 192.168.3.250

IP address for target station: 192.168.3.251



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 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) 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 User's Manual (CC-Link IE TSN) for details on setting with GX Works3.

Refer to ☞ Page 142 M+FX5CCLGNMS_SetAddress (Own station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

Program

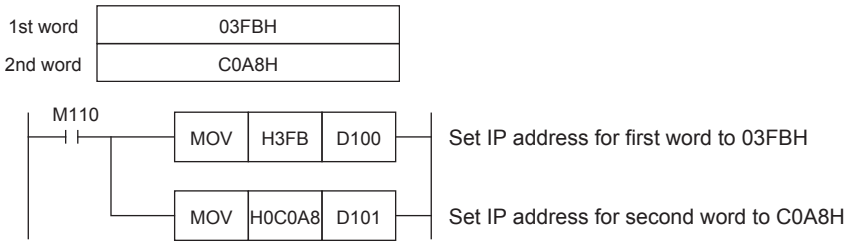
The data is read from the IP address of the target station using M+FX5CCLGNMS_DeviceRead (Reading of another station device).

• 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.

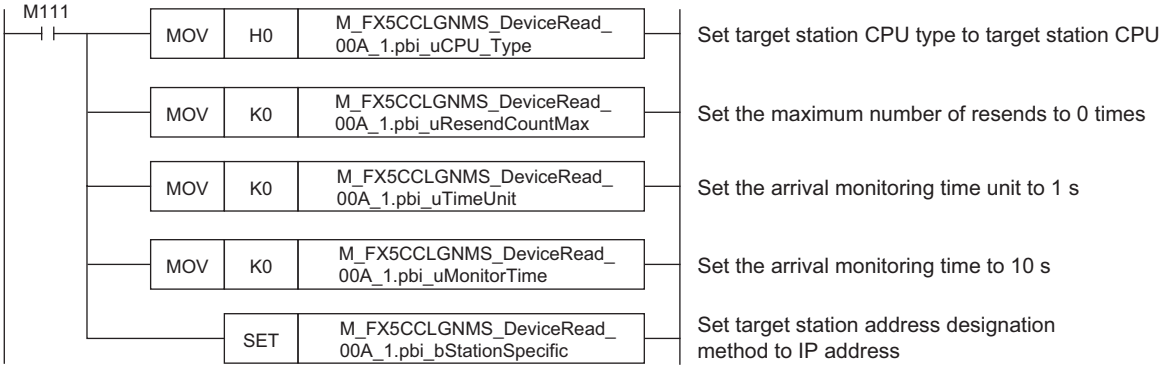
Item	Decimal	Hexadecimal
First octet (2nd word)	192	C0
Second octet (2nd word)	168	A8
Third octet (1st word)	3	03
Fourth octet (1st word)	251	FB

Set as shown below for this usage example.



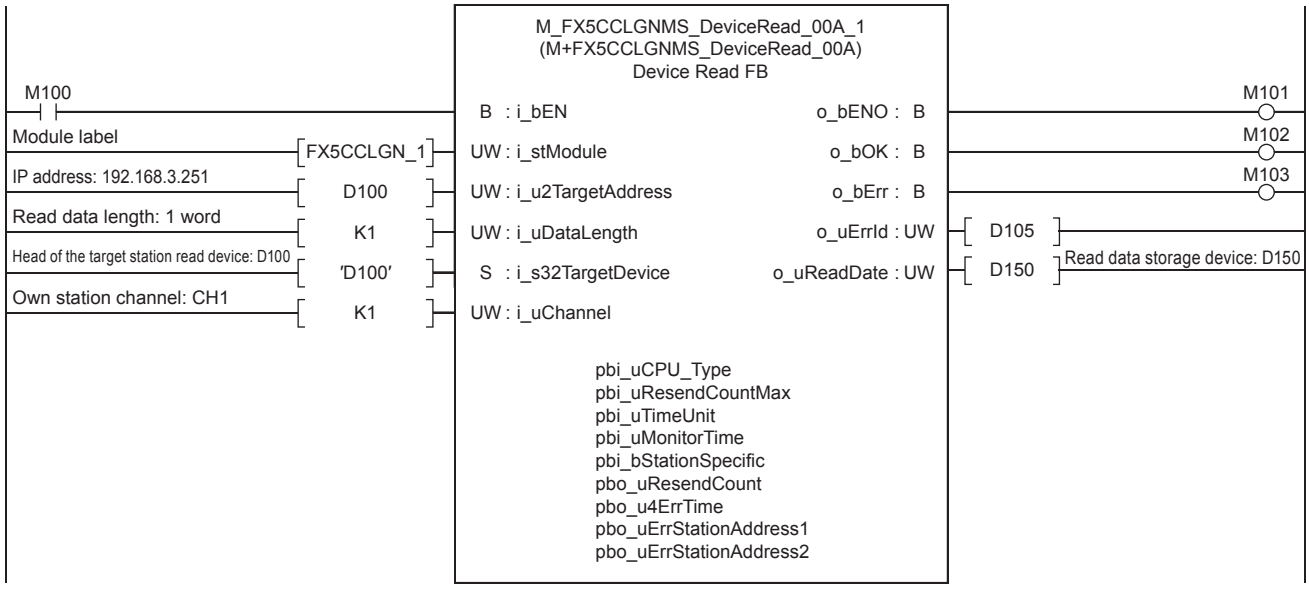
• Setting the operation parameter

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.



6.8 M+FX5CCLGNMS_DeviceWrite (Writing to another station device)

Data is written to the designated 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

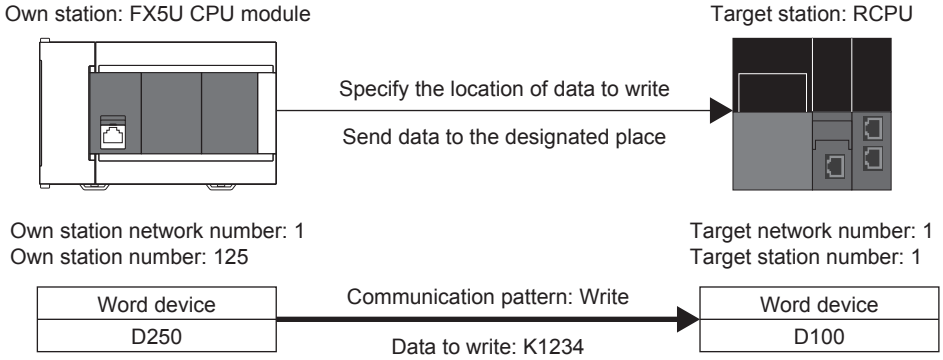
System configuration

Refer to ☞ Page 14 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 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) 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 User's Manual (CC-Link IE TSN) for details on setting with GX Works3.

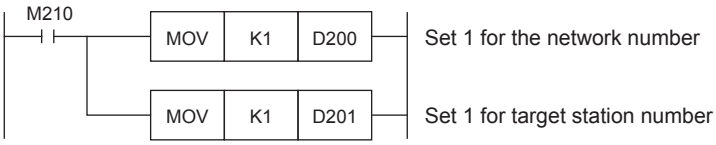
Refer to ☞ Page 142 M+FX5CCLGNMS_SetAddress (Own station number/IP address setting) for details on setting with M+FX5CCLGNMS_SetAddress (Station number/IP address setting).

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.

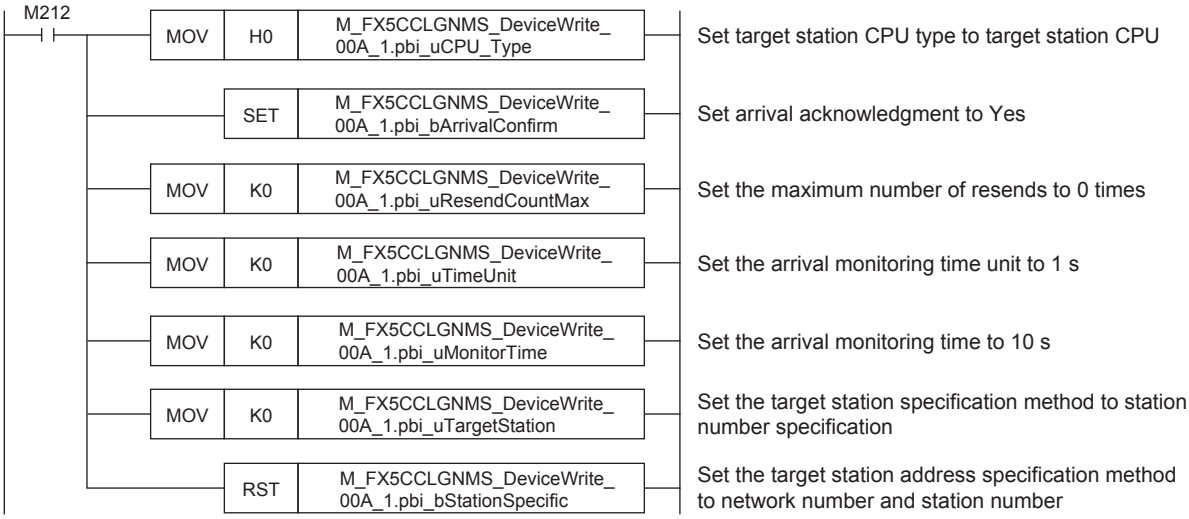


• Setting the write data storage device

Set the data K1234 to be written to D250.

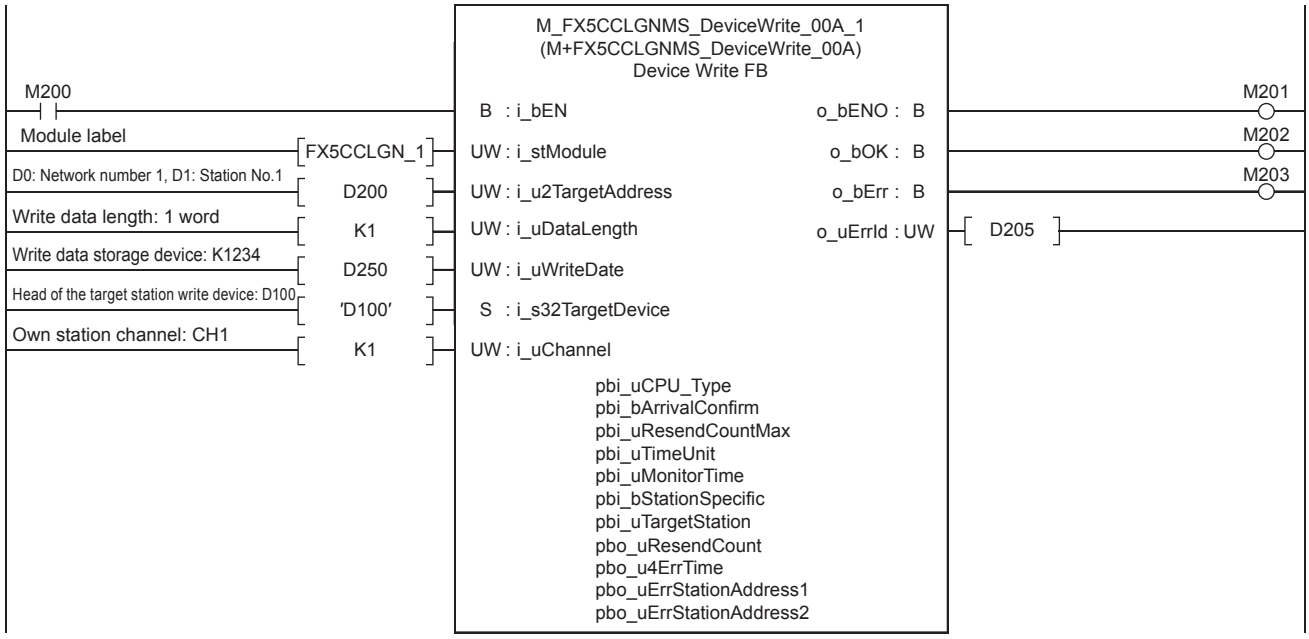
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_DeviceWrite (Writing to another station device).



• 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

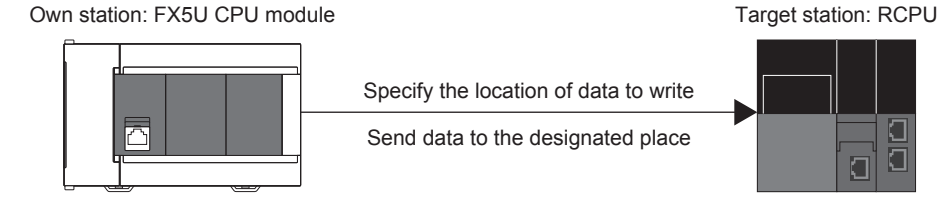
System configuration

Refer to ☞ Page 14 System Configuration.

Outline of example of program

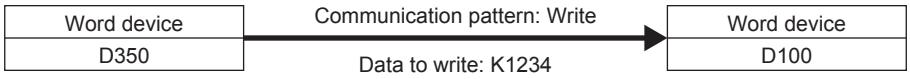
The value stored in the own station device D350 is written into device D100 of the target station.

The target station is specified with the IP address.



Own station IP address: 192.168.3.250

IP address for target station: 192.168.3.251



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 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) 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 User's Manual (CC-Link IE TSN) for details on setting with GX Works3.

Refer to ☞ Page 142 M+FX5CCLGNMS_SetAddress (Own 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).

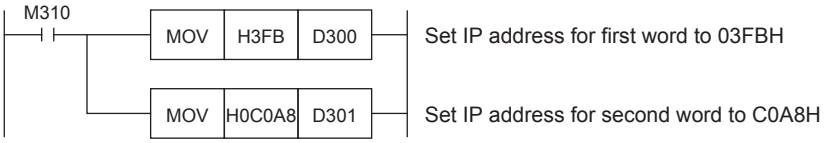
• Setting the target station IP address

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

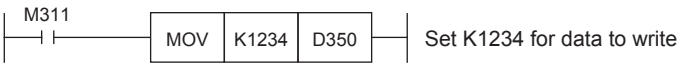
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



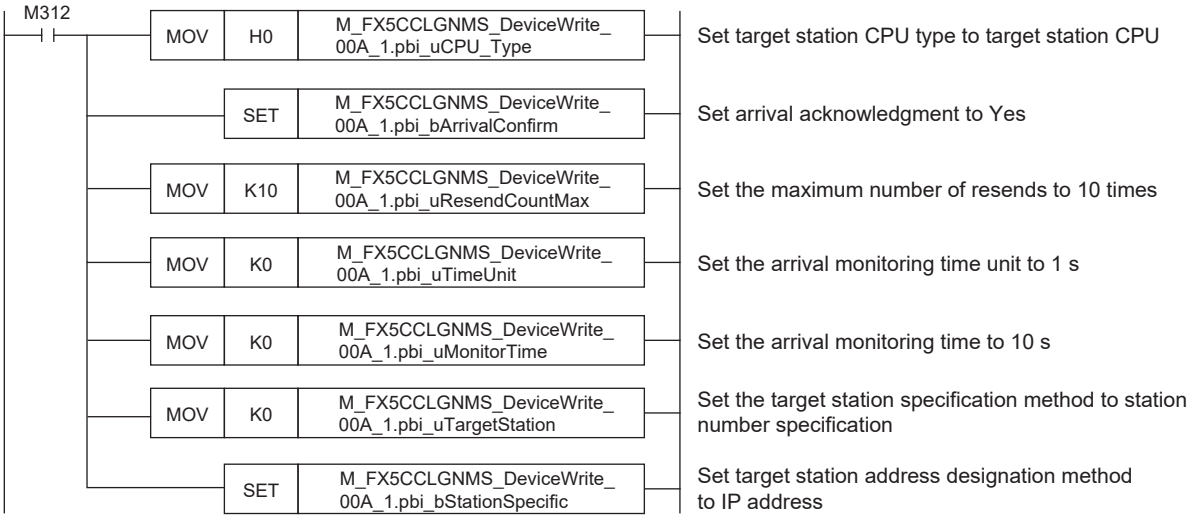
• Setting the write data storage device

Set the data K1234 to be written to D350.



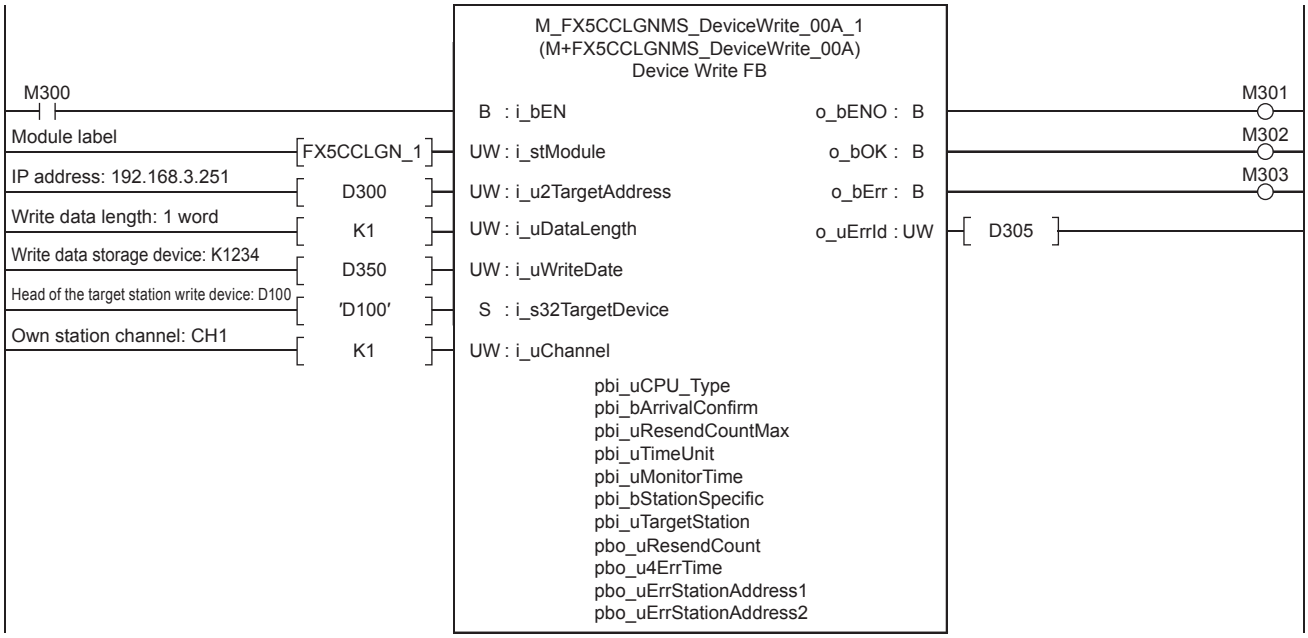
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_DeviceWrite (Writing to another station device).



• 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.



6.9 M+FX5CCLGNMS_Send (Sending data to another station)

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 data to another station). 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.

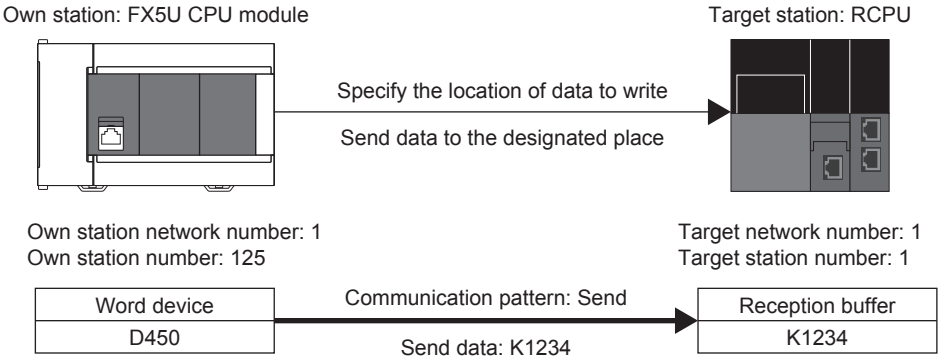
When the target station address specification method is OFF

System configuration

Refer to ☞ Page 14 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 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) for details on the setting method.

• Station number setting

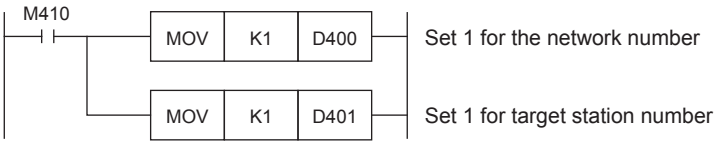
The own station number is set with GX Works3 or M+FX5CCLGNMS_SetAddress (Station number/IP address setting). Refer to the 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) for details on setting with GX Works3.
Refer to ☞ Page 142 M+FX5CCLGNMS_SetAddress (Own station number/IP address setting) for details 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 data to another station).

• 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.

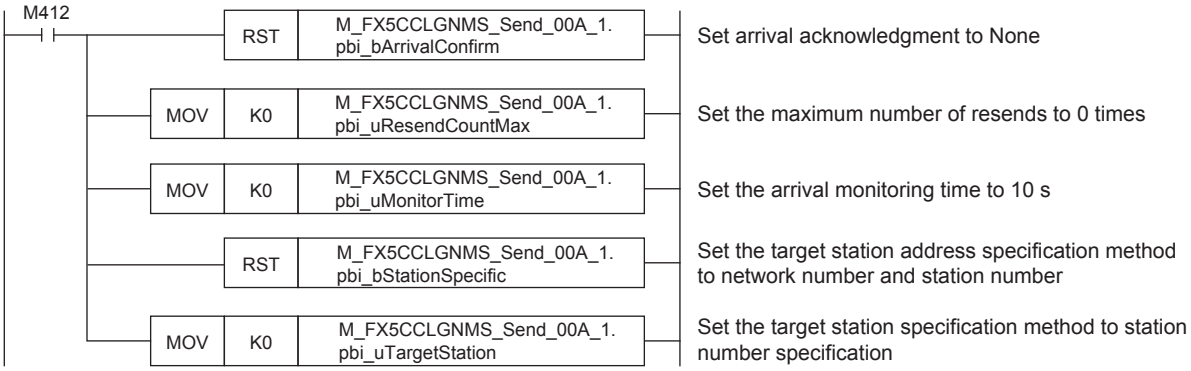


• Setting the send data storage device

In D450, set K1234 of the data to send to the target station.

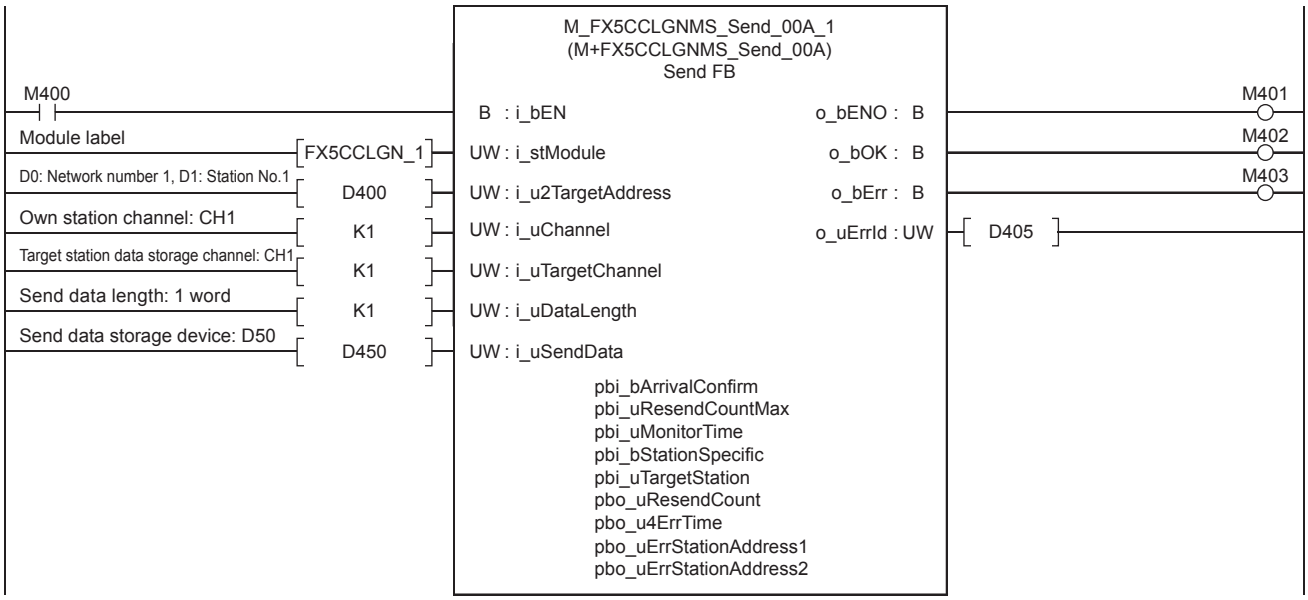
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_Send (Sending data to another station) 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 data to another station) FB.



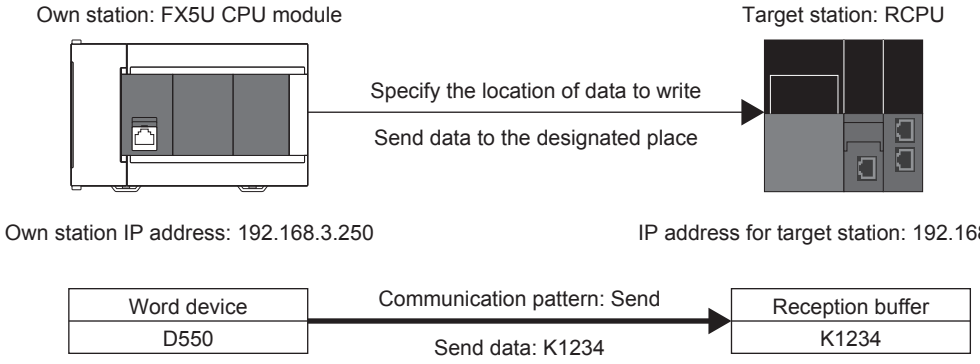
When the target station address specification method is ON

System configuration

Refer to ☞ Page 14 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 📖MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) 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 User's Manual (CC-Link IE TSN) for details on setting with GX Works3.

Refer to ☞ Page 142 M+FX5CCLGNMS_SetAddress (Own 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 data to another station).

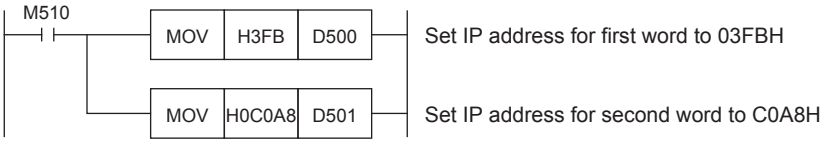
• Setting the target station IP address

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

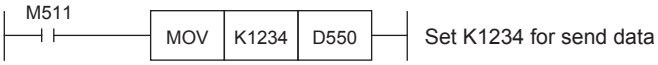
Set as shown below for this usage example.

1st word	03FBH
2nd word	C0A8H



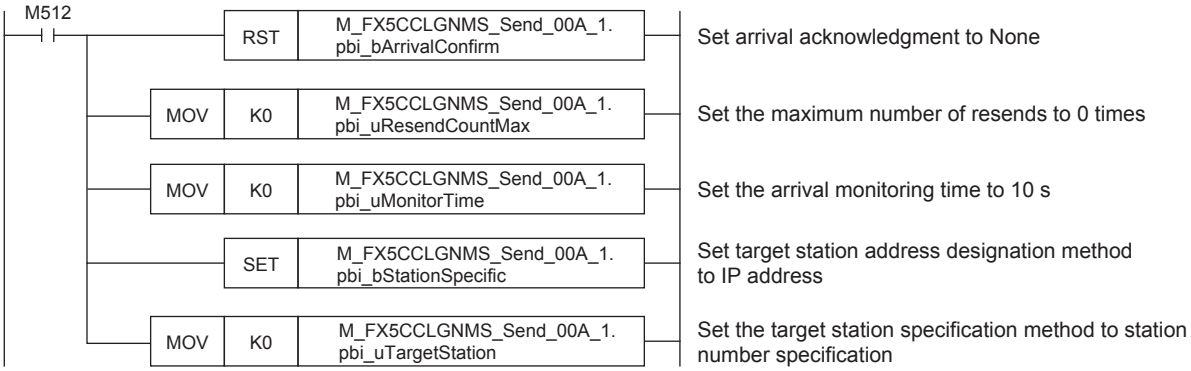
• Setting the send data storage device

In D550, set K1234 of the data to send to the target station.



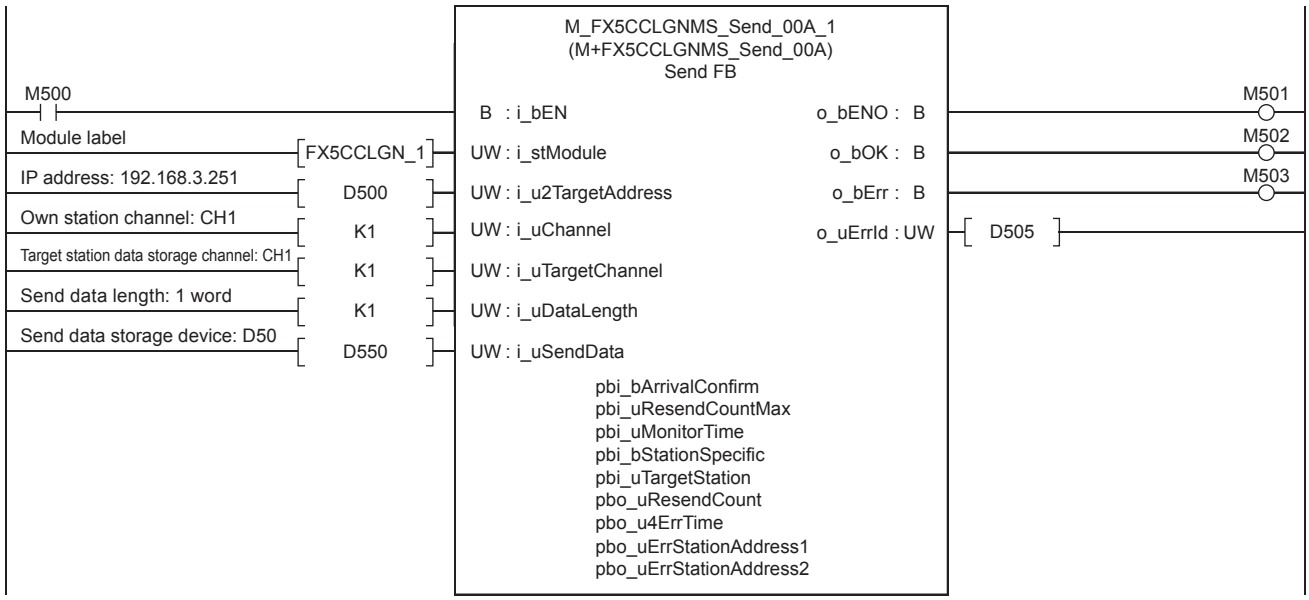
• Setting the operation parameter

Set the operation parameter used for M+FX5CCLGNMS_Send (Sending data to another station) 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 data to another station) FB.



6.10 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 14 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 MELSEC iQ-F FX5 User's Manual (CC-Link IE TSN) 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).

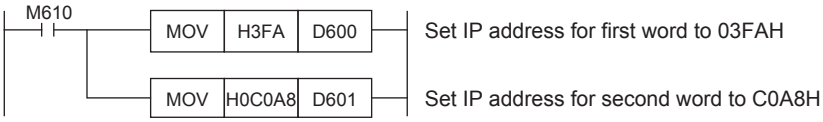
- Setting the IP address

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

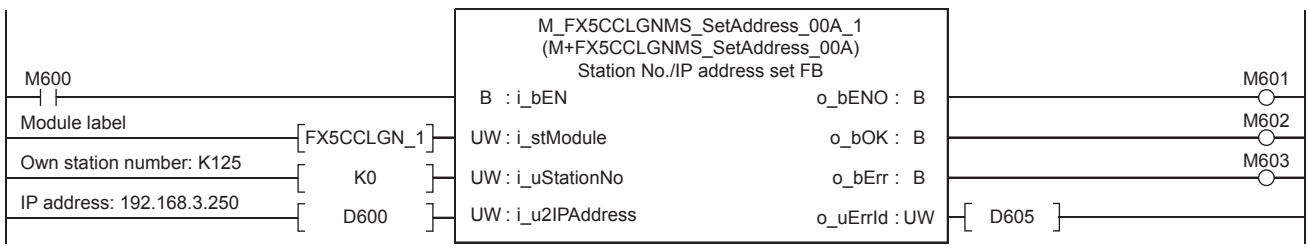
Set as shown below for this usage example.

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.



6.11 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).

Overview

This function block establishes connection with an MQTT broker (server), sends a SUBSCRIBE command, and receives a message in ASCII. After acquiring the necessary data from receive data, the function block creates the send data for the processed data and sends the message.

System configuration

Refer to the following.

☞ Page 14 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 206 Preliminary setting)

3. Parameter setting

Set the parameter. (☞ Page 84 Parameter setting)

4. Program creation

Create a program. (☞ Page 209 Program)

Preliminary setting

Set the data to be sent in the following areas.

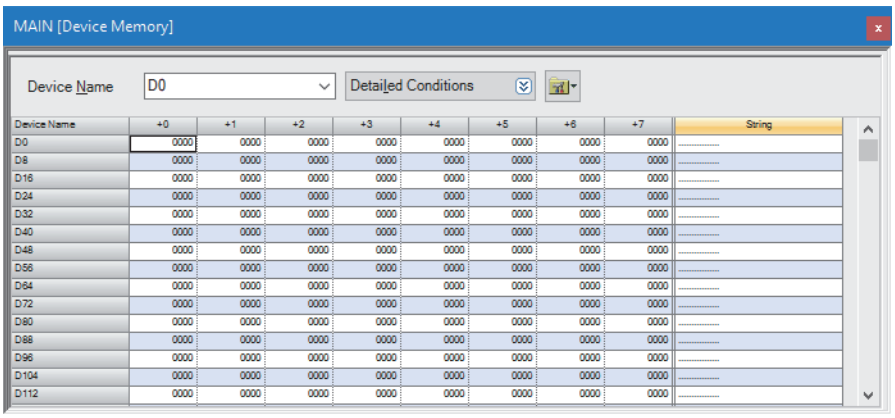
- Will topic name: R0 to R5
- Will message: R300 to R305

Operating procedure

1. Write the sample project into the CPU module and set the CPU module to RUN.

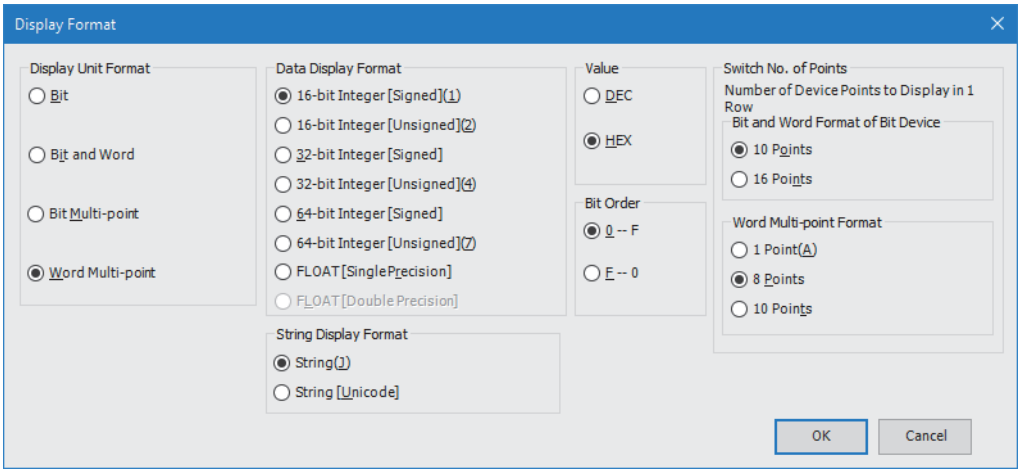
2. Open the device memory editor. Set the display format as follows.

Navigation window ⇨ [Device] ⇨ [Device Memory] ⇨ [MAIN (data name)]



3. Set the display format as follows.

[View] ⇨ [Display Format Detailed Setting]

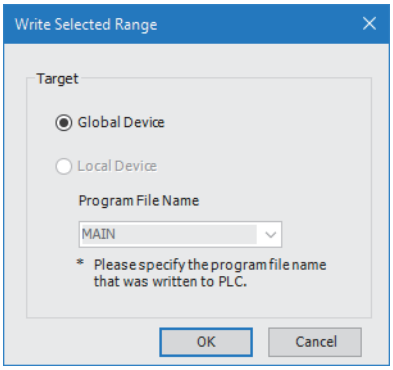


4. Input the following data into the table of the device memory editor.

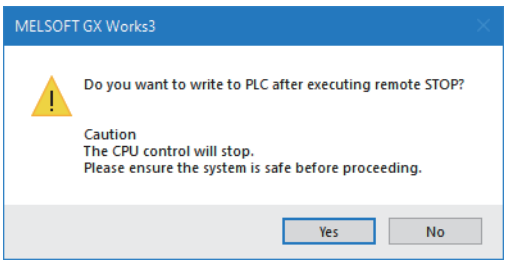
Item	Device name	Input data							
		+0	+1	+2	+3	+4	+5	+6	+7
Will topic name data	R0	6957	6C6C	6F54	6970	4163	0000	0000	0000
Will message data	R300	6957	6C6C	654D	7373	6761	4165	0000	0000
Subscribe topic name data	R600	7553	7362	7263	6269	5465	706F	6369	0041
Publish topic name data	R700	7550	6C62	7369	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.

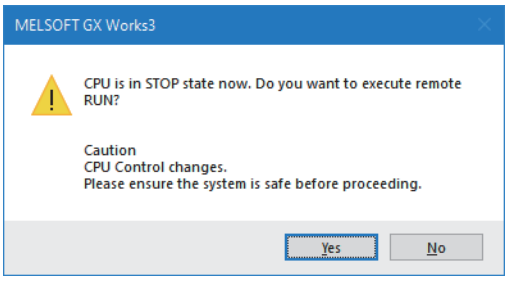
Select data ⇨ Right-click ⇨ [Online] ⇨ [Write Selected Range] ⇨ "Use Common File Register in All Programs" ⇨ [OK]



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.



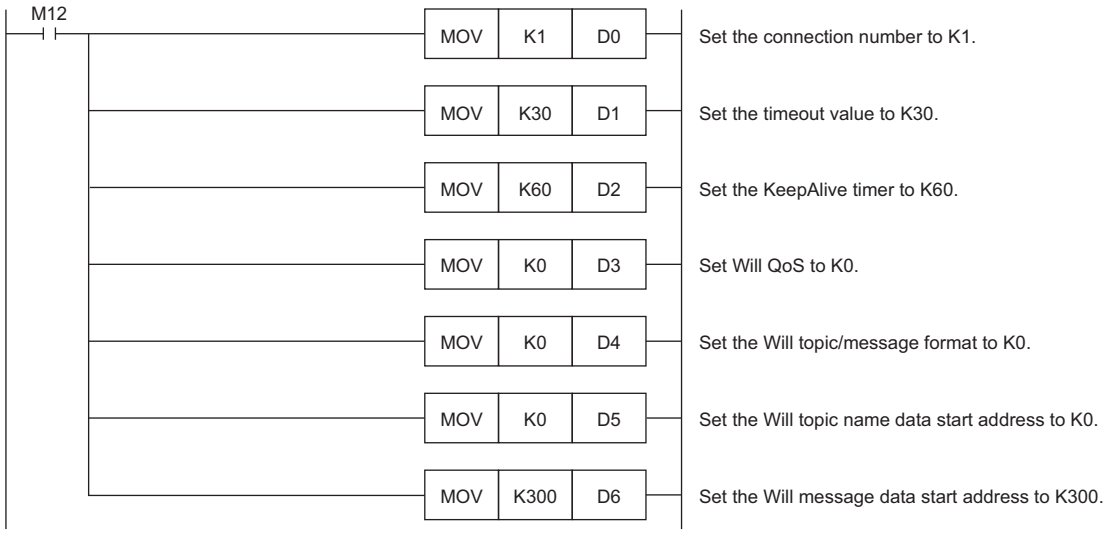
Parameter setting

Refer to the following.

☞ Page 84 Parameter setting

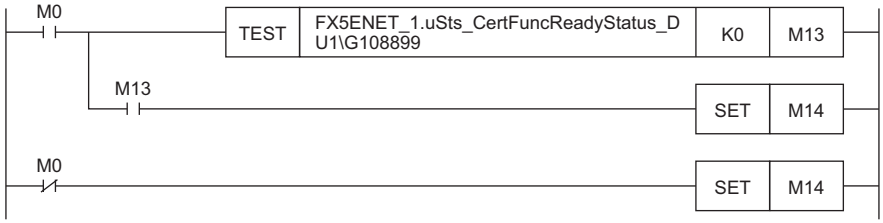
Program

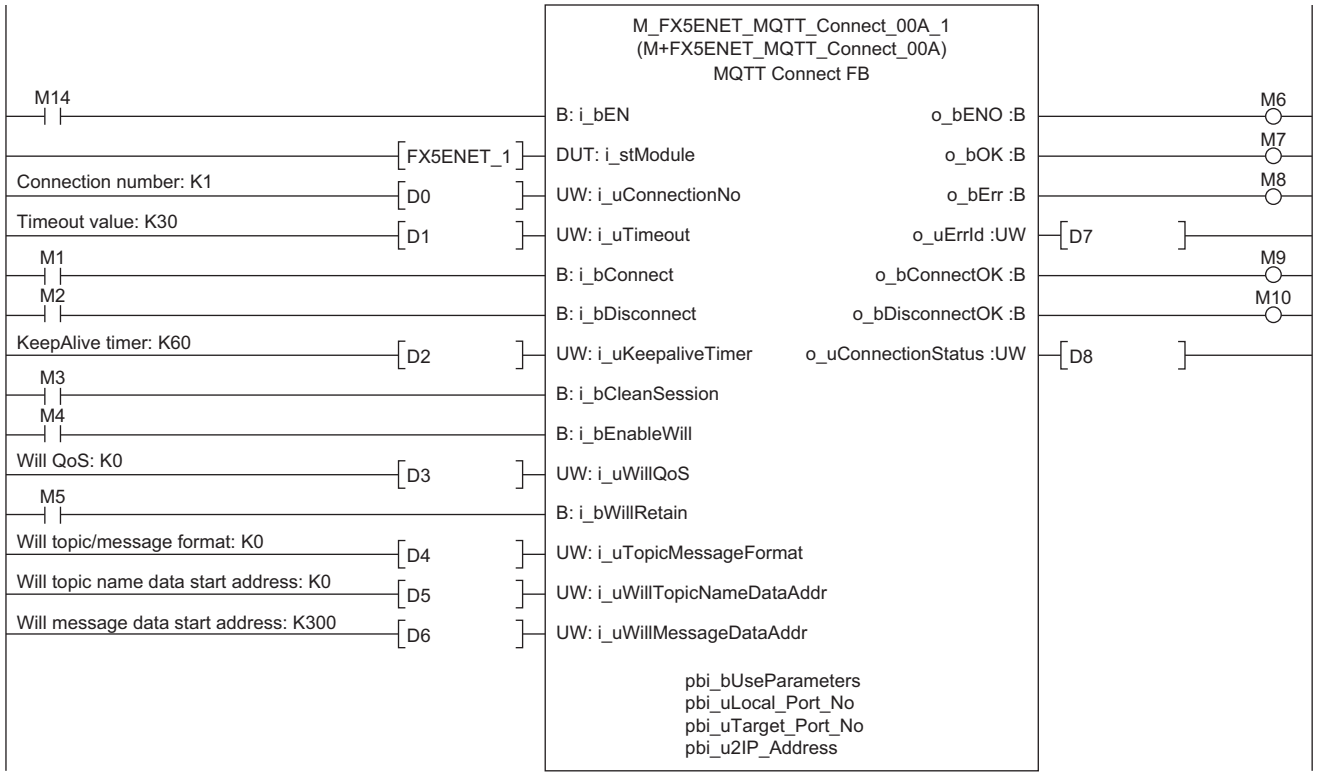
M12 turns on for setting the information used for M+ENET_MQTT_Connect (MQTT connection establishment).



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.





6.12 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).

Overview

This function block establishes connection with an MQTT broker (server), sends a SUBSCRIBE command, and receives a message in ASCII. After acquiring the necessary data from receive data, the function block creates the send data for the processed data and sends the message.

System configuration

Refer to the following.

☞ Page 14 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 210 Preliminary setting)

3. Parameter setting

Set the parameter. (☞ Page 84 Parameter setting)

4. Program creation

Create a program. (☞ Page 211 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 206 Preliminary setting

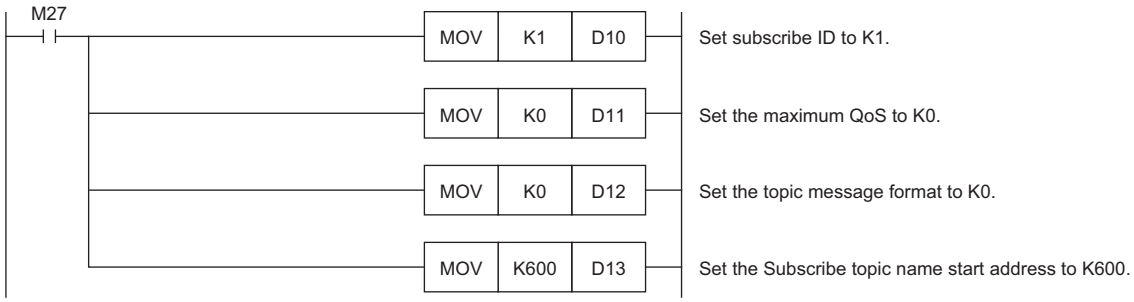
Parameter setting

Refer to the following.

☞ Page 84 Parameter setting

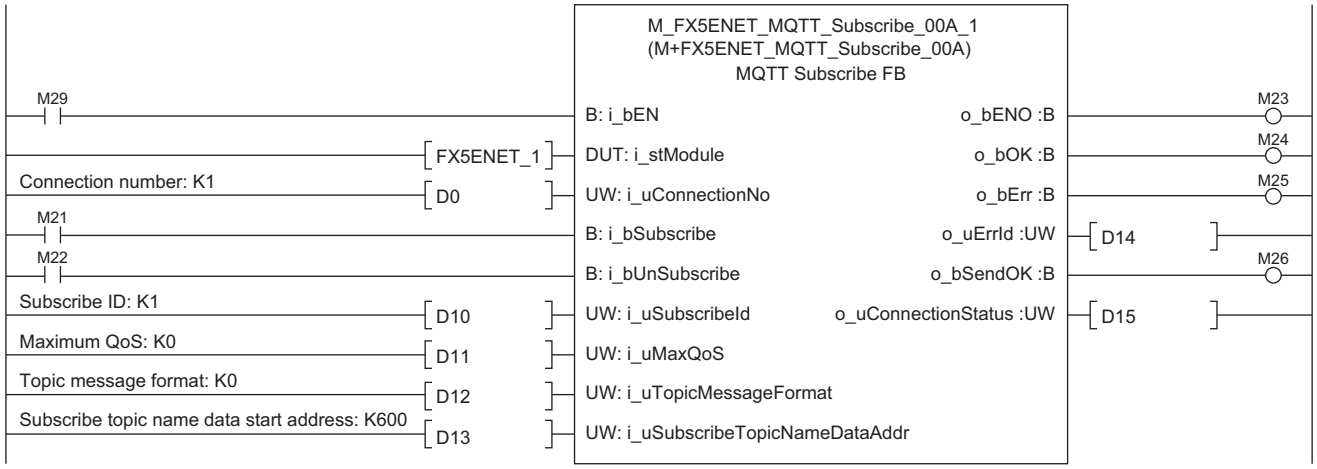
Program

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.



6.13 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).

Overview

This function block establishes connection with an MQTT broker (server), sends a SUBSCRIBE command, and receives a message in ASCII. After acquiring the necessary data from receive data, the function block creates the send data for the processed data and sends the message.

System configuration

Refer to the following.

☞ Page 14 System Configuration

Workflow

1. FB library registration

Register the FB library. For the operating procedures, refer to the following.

📖GX Works3 Operating Manual

2. Parameter setting

Set the parameter. (☞ Page 84 Parameter setting)

3. Create a program.

Create a program. (☞ Page 213 Program)

Preliminary setting

No preliminary settings are required to use this FB.

Parameter setting

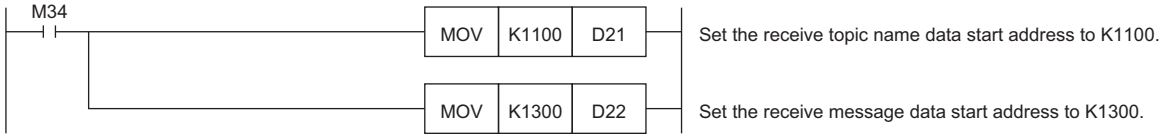
Refer to the following.

☞ Page 84 Parameter setting

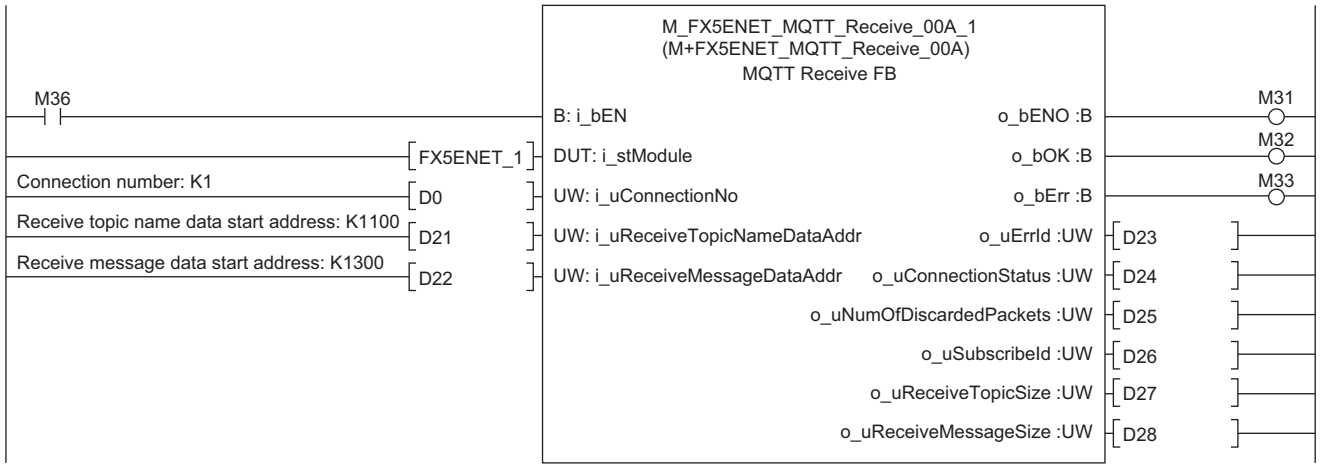
Program

■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).



■Acquisition of only the required strings from receive data

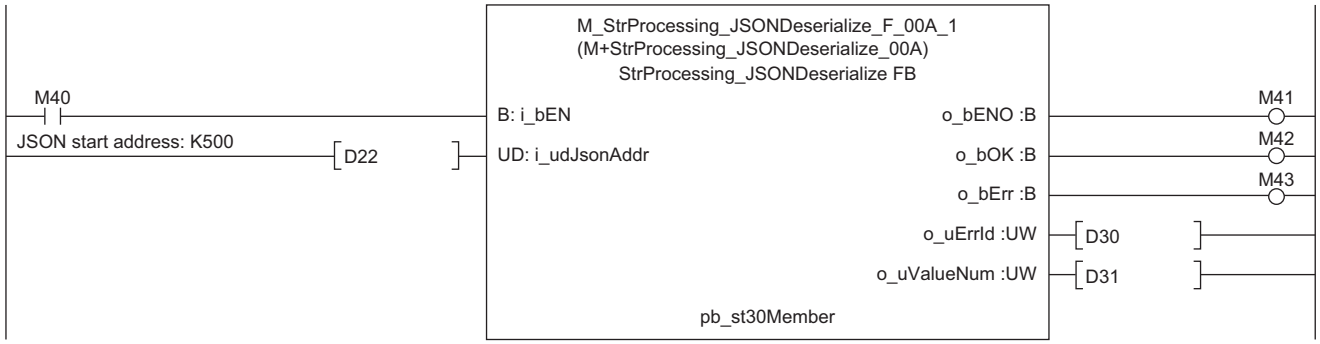
• Settings for required member information

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).



6.14 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).

Overview

This function block establishes connection with an MQTT broker (server), sends a SUBSCRIBE command, and receives a message in ASCII. After acquiring the necessary data from receive data, the function block creates the send data for the processed data and sends the message.

System configuration

Refer to the following.

☞ Page 14 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 215 Preliminary setting)

3. Parameter setting

Set the parameter. (☞ Page 84 Parameter setting)

4. Program creation

Create a program. (☞ Page 216 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 206 Preliminary setting

Parameter setting

Refer to the following.

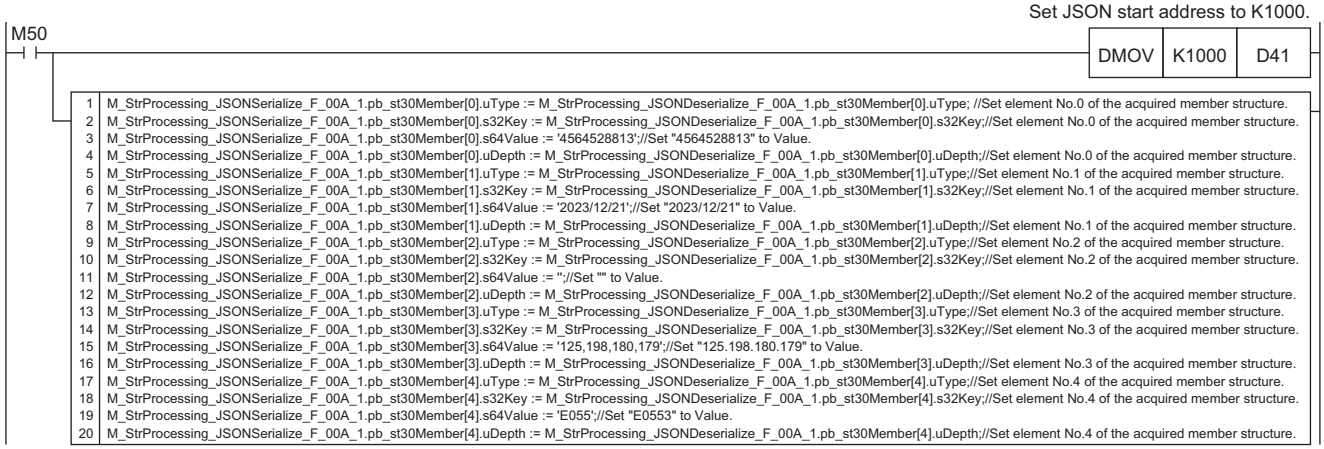
☞ Page 84 Parameter setting

Program

■Send data creation

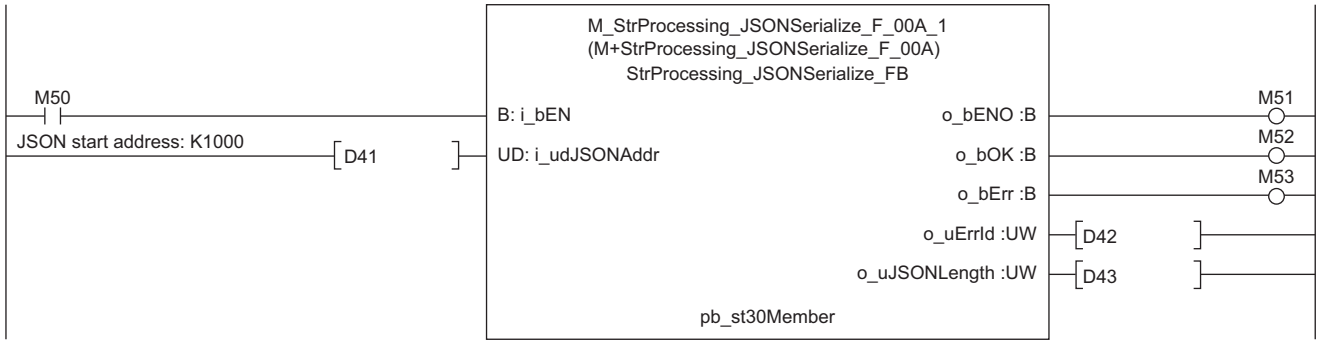
• Settings for data to be sent

M50 (Execution command) turns on for setting the data to be sent.



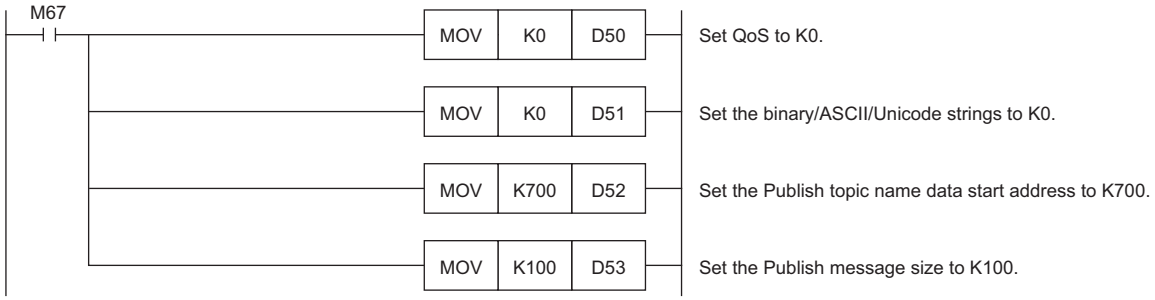
• JSON string creation

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.

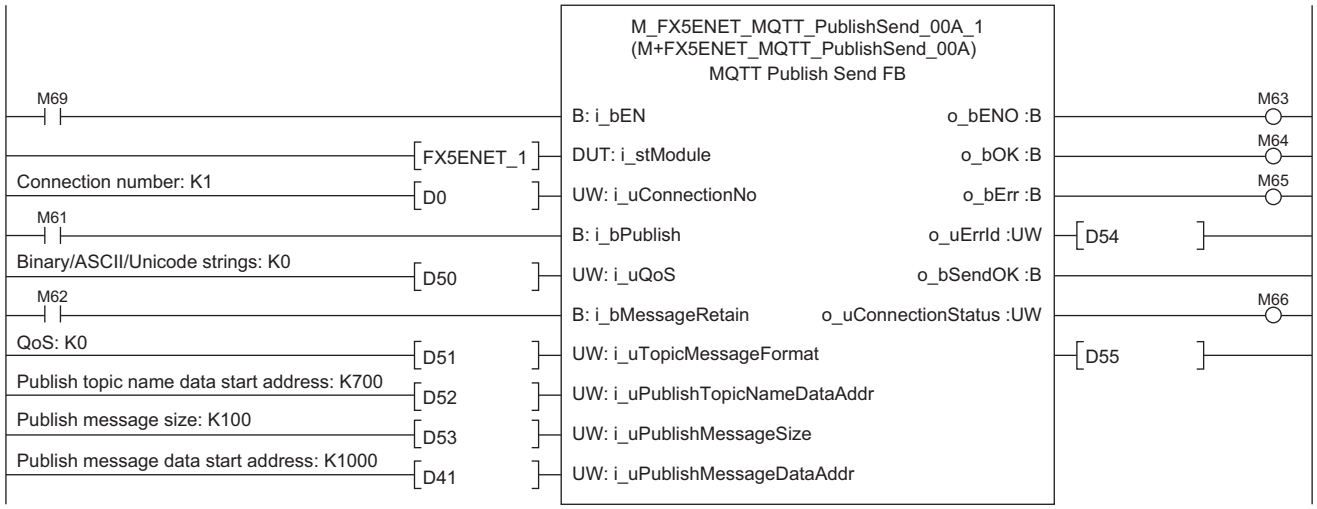


■Sending of message data

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.



6.15 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 function block establishes a TLS/TCP session with an SMTP server. Then, it sends E-mail data.

System configuration

Refer to the following.

☞ Page 14 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-ENET User's Manual

2. Preliminary setting

Set the area of data to be sent. (☞ Page 218 Preliminary setting)

3. Program creation

Create a program. (☞ Page 221 Program)

Preliminary setting

Set the data to be sent in the following areas.

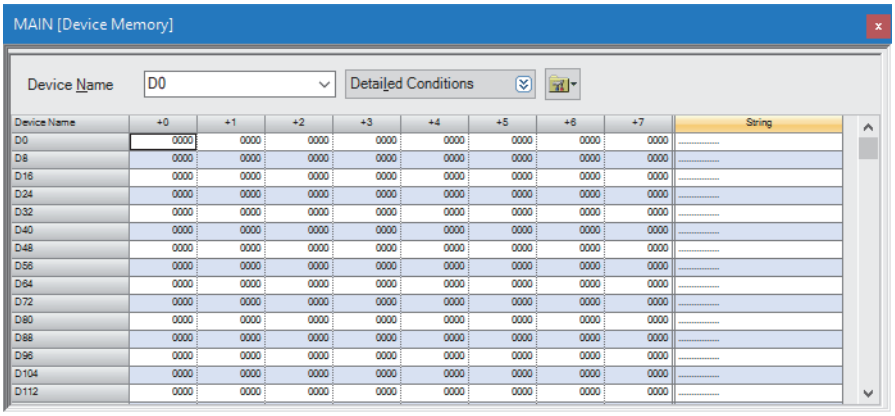
- Send destination address: R0 to R7
- Subject data: R130 to R135
- Message body data: R250 to R254
- Attachment data: R300 to R305

Operating procedure

1. Write the sample project into the CPU module and set the CPU module to RUN.

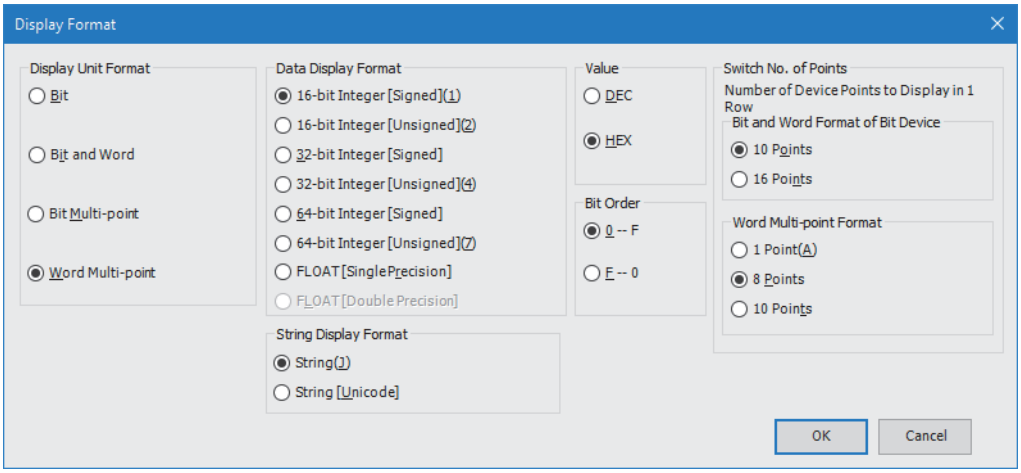
2. Open the device memory editor. Set the display format as follows.

Navigation window ⇨ [Device] ⇨ [Device Memory] ⇨ [MAIN (data name)]



3. Set the display format as follows.

[View] ⇨ [Display Format Detailed Setting]

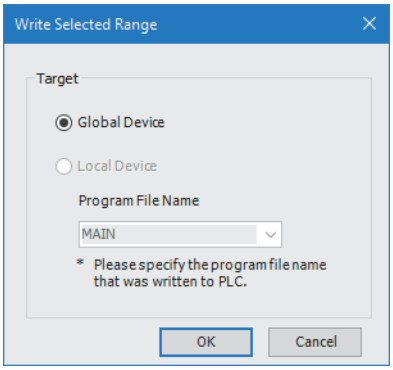


4. Input the following data into the table of the device memory editor.

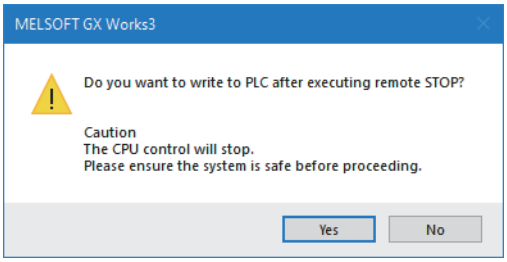
Item	Device name	Input data							
		+0	+1	+2	+3	+4	+5	+6	+7
Send destination address	R0	6564	4066	7856	6D61	6C70	2E65	6F63	006D
Subject data	R130	7533	6A62	6365	4474	7461	4161	0000	0000
Message body data	R250	6F42	7964	6144	6174	0041	0000	0000	0000
Attachment data	R300	7441	6174	6863	6144	6174	0041	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.

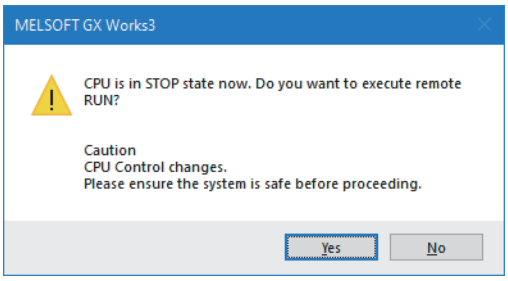
Select data ⇨ Right-click ⇨ [Online] ⇨ [Write Selected Range] ⇨ "Use Common File Register in All Programs" ⇨ [OK]



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.



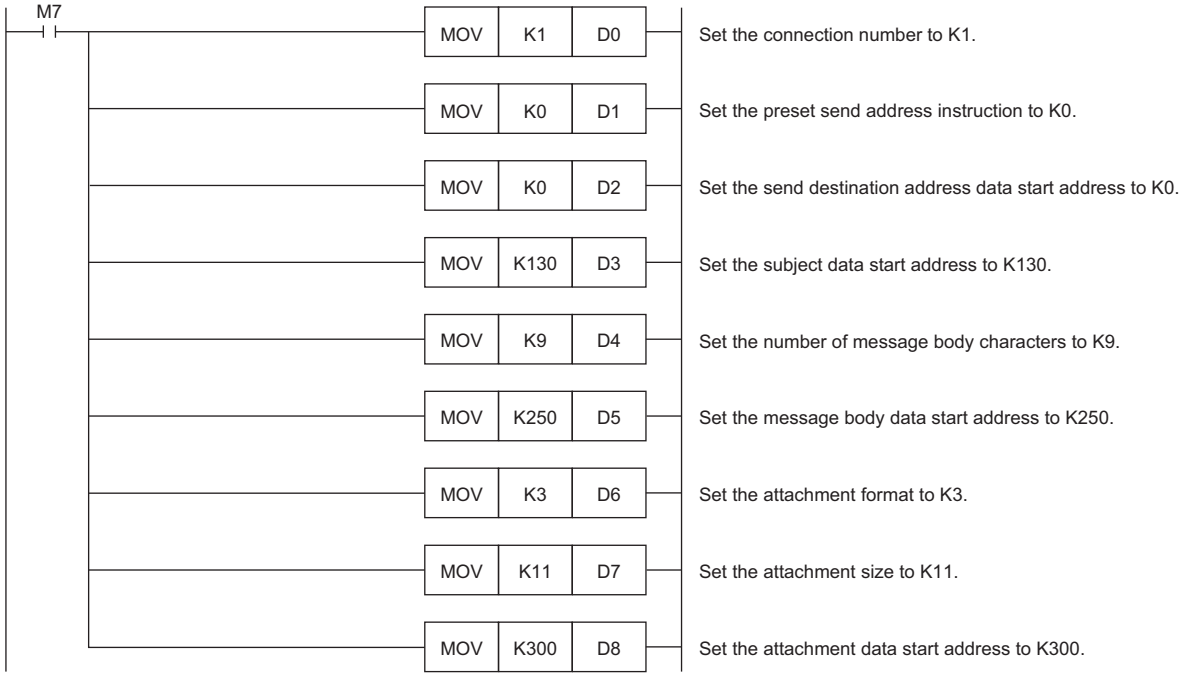
Parameter setting

Refer to the following.

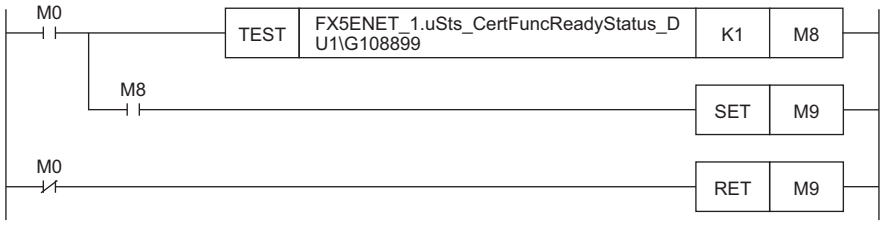
☞ Page 106 Parameter setting

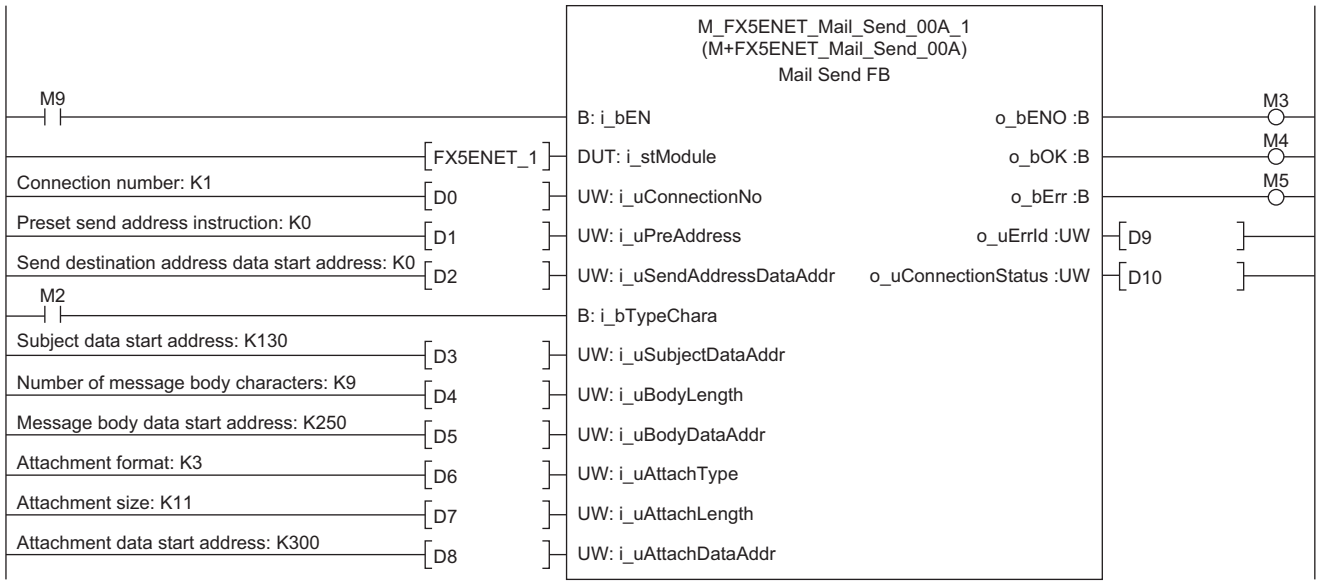
Program

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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REVISIONS

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