MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-R series

MELSEC iQ-R Serial Communication Module Function Block Reference

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using the products described under "Relevant products", please read this manual and the relevant manuals carefully and pay full attention to safety to handle the products correctly.

The precautions given in this manual are concerned with the products only. For the safety precautions of the programmable controller system, refer to the MELSEC iQ-R Module Configuration Manual.

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

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

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

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

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

CONDITIONS OF USE FOR THE PRODUCT

(1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi Electric representative in your region.

(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric MELSEC iQ-R series programmable controllers.
This manual describes the module function blocks for the relevant products listed below.
Before using the products, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the MELSEC iQ-R series programmable controller to handle the products correctly.
Please make sure that the end users read this manual.

Relevant products

RJ71C24
RJ71C24-R2
RJ71C24-R4

CONTENTS

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R Serial Communication Module Function Block Reference [BCN-P5999-0379] (this reference)	Specifications, functions, and input/output labels of function blocks for a serial communication module	e-Manual PDF
MELSEC iQ-R Serial Communication Module User's Manual(Startup) [SH-081250ENG]	Specifications, procedures prior to operation, system configurations, wring, and data communication examples of a serial communication module	Print book
		e-Manual PDF
MELSEC iQ-R Serial Communication Module User's Manual(Application) [SH-081251ENG]	Functions, input/output signals, buffer memory, parameter setting, and trouble shooting of a serial communication module	Print book
		e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- The hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Buffer memory	Memory in an intelligent function module to store data such as setting values and monitor values. For CPU modules, it refers to memory to store data such as setting values and monitor values of the Ethernet function, or data used for data communication of the multiple CPU system function.
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance.
MC protocol	An abbreviation for the MELSEC communication protocol. This protocol is used to access a MC protocol-compatible device or a programmable controller connected to a MC protocol-compatible device from an external device.
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.
SLMP	An abbreviation for Seamless Message Protocol. This protocol is used to access an SLMP-compatible device or a programmable controller connected to an SLMP-compatible device from an external device.
User frame	A data name used when registering the fixed format part in a message to be transmitted between an external device and a serial communication module, and using it for data transmission and reception. (The content of data in a user frame must be the same as the specifications of the external device.)

1 OVERVIEW

Function blocks (FBs) in this reference are the module FBs for a MELSEC iQ-R series serial communication module.

1.1 FB List

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

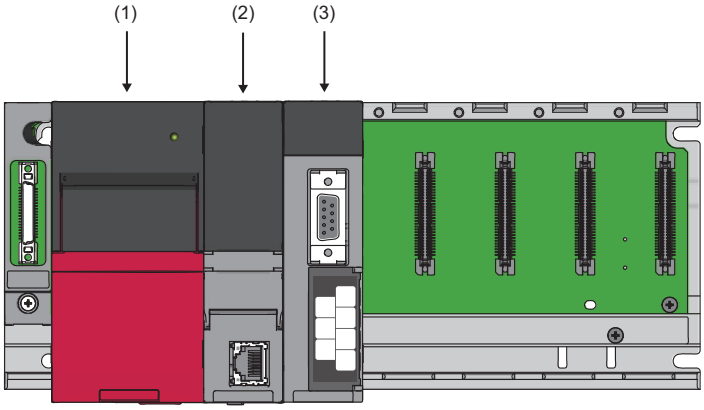
Name	Description
M+RJ71C24_SendOndemand	Sends data using the on-demand function of SLMP (MC protocol).
M+RJ71C24_Output	Sends data for a specified data points.
M+RJ71C24_Input	Reads the received data.
M+RJ71C24_BidirectionalOutput	Sends data for a specified data points.
M+RJ71C24_BidirectionalInput	Reads the received data.
M+RJ71C24_ReadInstructionBusy	Reads the transmission status of the data sent/received using the dedicated instructions or FBs.
M+RJ71C24_SendUserFrame	Sends data using the nonprocedural protocol communication and the user frame according to the setting of the user frame specification area for sending data.
M+RJ71C24_PutUserFrame	Registers and deletes the user frame.
M+RJ71C24_GetUserFrame	Reads the user frame.
M+RJ71C24_ExeCommonProtocol	Executes the protocol registered with GX Works3.

1.2 How to Obtain

Module FBs are installed at the same time as installing GX Works3; however, the module FBs in this reference may not be installed with some versions of GX Works3. It is recommended to install the latest version of GX Works3.

1.3 System Configuration

The following shows the system configuration for using the module FBs in this reference.



(1) Power supply module
(2) CPU module
(3) Serial communication module

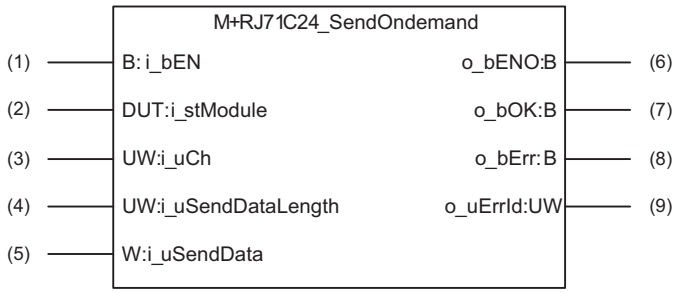
For the specifications of modules to be used, refer to the user's manual of each module.

2 SERIAL COMMUNICATION MODULE FB

2.1 M+RJ71C24_SendOndemand

Overview

Sends data using the on-demand function of SLMP (MC protocol).



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uCh	Send channel	Word [Unsigned]/ Bit String [16-bit]	1, 2	Set the channel to which the data is sent. • 1: Channel 1 (CH1 side) • 2: Channel 2 (CH2 side)
(4)	i_uSendDataLength	Number of send data points	Word [Unsigned]/ Bit String [16-bit]	1 or more	Set the number of send data points in the units (word/ byte) specified to the following area of the buffer memory. • Channel 1 (CH1 side): 150 (96H) • Channel 2 (CH2 side): 310 (136H)
(5)	i_uSendData	Send data storage device	Word [Unsigned]/ Bit String [16-bit]	—	Set the start address of the device where the send data is stored. The following cannot be specified as an argument. Specifying any of the following may cause a CPU error (2820H: Device/label/buffer memory specification incorrect). • Dynamically specified array elements (Example: wLabel[D0]) • Digit-specified labels (Example: K4bLabel) • Indirectly specified devices (Example: @W0) • Local devices (Example: #D0)

Output label

No.	Label	Label name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(7)	o_bOK	Normal completion	Bit	OFF	This label turns ON for one scan when the operation is completed normally.
(8)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(9)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that has occurred in the FB.

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

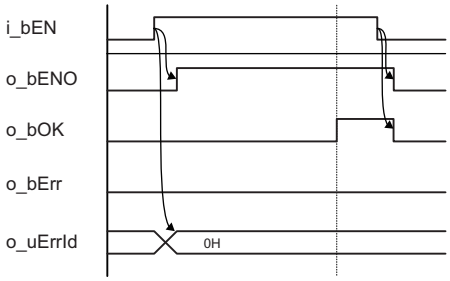
Item	Description
Language	Ladder diagram
Number of basic steps	46 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

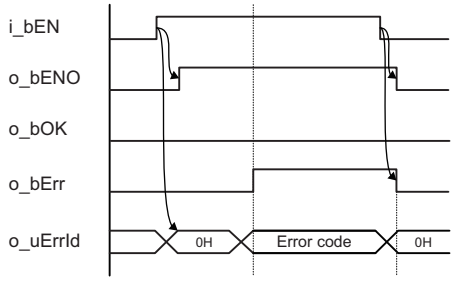
By turning ON i_bEN (Execution command), data is sent using the on-demand function of SLMP (MC protocol).

Timing chart of I/O signals

■ In normal completion



■ In error completion (also the same for a module 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 dedicated instruction GP.ONDEMAND.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

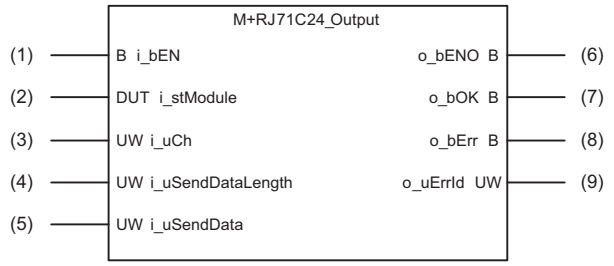
Error code

The error code is the same as the one that generates when the G(P).ONDEMAND instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.2 M+RJ71C24_Output

Overview

Sends the specified data using the nonprocedural protocol.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uCh	Send channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Set the channel to which the data is sent. • 1: Channel 1 (CH1 side) • 2: Channel 2 (CH2 side)
(4)	i_uSendDataLength	Number of send data points	Word [Unsigned]/Bit String [16-bit]	1 or more	Set the number of send data points in the units (word/byte) specified to the following area of the buffer memory. • Channel 1 (CH1 side): 150 (96H) • Channel 2 (CH2 side): 310 (136H)
(5)	i_uSendData	Send data storage device	Word [Unsigned]/Bit String [16-bit]	—	Set the start address of the device where the send data is stored. The following cannot be specified as an argument. Specifying any of the following may cause a CPU error (2820H: Device/label/buffer memory specification incorrect). • Dynamically specified array elements (Example: wLabel[D0]) • Digit-specified labels (Example: K4bLabel) • Indirectly specified devices (Example: @W0) • Local devices (Example: #D0)

Output label

No.	Label	Label name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(7)	o_bOK	Normal completion	Bit	OFF	This label turns ON for one scan when the operation is completed normally.
(8)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(9)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that has occurred in the FB.

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	46 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), data is sent in any message format using the nonprocedural protocol.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction GP.OUTPUT.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

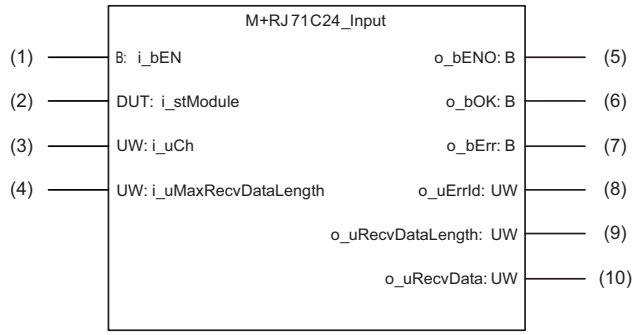
Error code

The error code is the same as the one that generates when the G(P).OUTPUT instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.3 M+RJ71C24_Input

Overview

Reads the data received using the nonprocedural protocol.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uCh	Receive channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Set the channel that receives the data. • 1: Channel 1 (CH1 side) • 2: Channel 2 (CH2 side)
(4)	i_uMaxRecvDataLength	Allowable number of receive data points	Word [Unsigned]/Bit String [16-bit]	0 or more	Set the allowable number of words of the receive data that can be stored in the receive data storage device.

Output label

No.	Label	Label 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	This label turns ON for one scan when the operation is completed normally.
(7)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(8)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the generated error code.
(9)	o_uRecvDataLength	Number of receive data points	Word [Unsigned]/Bit String [16-bit]	0	Stores the number of receive data points in the units (word/byte) specified to the following area of the buffer memory. • Channel 1 (CH1 side): 150 (96H) • Channel 2 (CH2 side): 310 (136H)
(10)	o_uRecvData	Receive data storage device	Word [Unsigned]/Bit String [16-bit]	0	Stores the receive data. The following cannot be specified as an argument. Specifying any of the following may cause a CPU error (2820H: Device/label/buffer memory specification incorrect). • Dynamically specified array elements (Example: wLabel[D0]) • Digit-specified labels (Example: K4bLabel) • Indirectly specified devices (Example: @W0) • Local devices (Example: #D0)

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	46 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), data is received in any message format using the nonprocedural protocol.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction G.INPUT.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

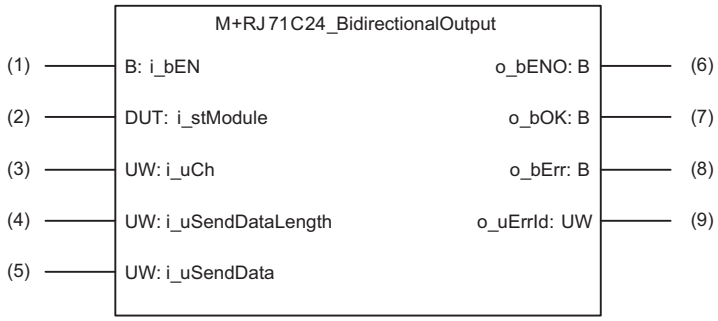
Error code

The error code is the same as the one that generates when the G.INPUT instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.4 M+RJ71C24_BidirectionalOutput

Overview

Sends the specified data using the bidirectional protocol.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uCh	Send channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Set the channel to which the data is sent. • 1: Channel 1 (CH1 side) • 2: Channel 2 (CH2 side)
(4)	i_uSendDataLength	Number of send data points	Word [Unsigned]/Bit String [16-bit]	1 or more	Set the number of send data points in the units (word/byte) specified to the following area of the buffer memory. • Channel 1 (CH1 side): 150 (96H) • Channel 2 (CH2 side): 310 (136H)
(5)	i_uSendData	Send data storage device	Word [Unsigned]/Bit String [16-bit]	—	Specify the start address of the device where the send data is stored. The following cannot be specified as an argument. Specifying any of the following may cause a CPU error (2820H: Device/label/buffer memory specification incorrect). • Dynamically specified array elements (Example: wLabel[D0]) • Digit-specified labels (Example: K4bLabel) • Indirectly specified devices (Example: @W0) • Local devices (Example: #D0)

Output label

No.	Label	Label name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(7)	o_bOK	Normal completion	Bit	OFF	This label turns ON for one scan when the operation is completed normally.
(8)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(9)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the generated error code.

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	45 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), data is sent using the bidirectional protocol.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction GP.BIDOUT.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

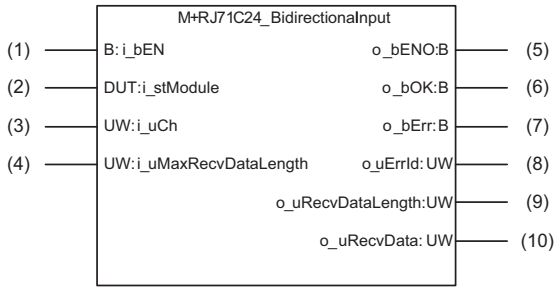
Error code

The error code is the same as the one that generates when the G(P).BIDOUT instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.5 M+RJ71C24_BidirectionalInput

Overview

Reads the data received using the bidirectional protocol.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uCh	Receive channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Set the channel that receives the data. • 1: Channel 1 (CH1 side) • 2: Channel 2 (CH2 side)
(4)	i_uMaxRecvDataLength	Allowable number of receive data points	Word [Unsigned]/Bit String [16-bit]	0 or more	Set the allowable number of words of the receive data that can be stored in the receive data storage device.

Output label

No.	Label	Label 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	This label turns ON for one scan when the operation is completed normally.
(7)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(8)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the generated error code.
(9)	o_uRecvDataLength	Number of receive data points	Word [Unsigned]/Bit String [16-bit]	0	Stores the number of receive data points in the units (word/byte) specified to the following area of the buffer memory. • Channel 1 (CH1 side): 150 (96H) • Channel 2 (CH2 side): 310 (136H)
(10)	o_uRecvData	Receive data storage device	Word [Unsigned]/Bit String [16-bit]	0	Stores the receive data. The following cannot be specified as an argument. Specifying any of the following may cause a CPU error (2820H: Device/label/buffer memory specification incorrect). • Dynamically specified array elements (Example: wLabel[D0]) • Digit-specified labels (Example: K4bLabel) • Indirectly specified devices (Example: @W0) • Local devices (Example: #D0)

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	46 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), data is received in any message format using the bidirectional protocol.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction G.BIDIN.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

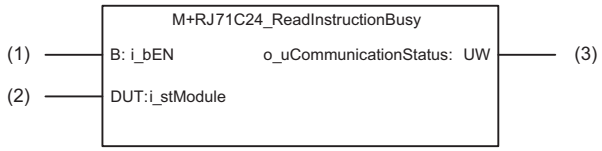
Error code

The error code is the same as the one that generates when the G(P).BIDIN instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.6 M+RJ71C24_ReadInstructionBusy

Overview

Reads the transmission status of the data sent/received using the dedicated instructions or FBs.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)

Output label

No.	Label	Label name	Data type	Default value	Description
(3)	o_uCommunicationStatus	Transmission status storage device	Word [Unsigned]/Bit String [16-bit]	0	When the processing using each instruction starts, '1' is stored in the corresponding bit. When the processing is completed, '0' is stored. The following shows the timing when the processing of each instruction is completed. • Execution status of FB: ON to OFF • Dedicated instruction completion flag: ON to OFF ■1st word • b0: Stores the execution status of the ONDEMAND, OUTPUT, PRR, and BIDOUT instructions directed at channel 1. • b1: Stores the execution status of the INPUT and BIDIN instructions directed at channel 1. • b2: Stores the execution status of the ONDEMAND, OUTPUT, PRR, and BIDOUT instructions directed at channel 2. • b3: Stores the execution status of the INPUT and BIDIN instructions directed at channel 2. • b4: Stores the execution status of the GETE and PUTE instructions. • b5: Stores the execution status of the CPRTCL instruction directed at channel 1. • b6: Stores the execution status of the CPRTCL instruction directed at channel 2. • b7 to b15: Always stores '0'. ■2nd word • b0 to b15: Always stores '0'.

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

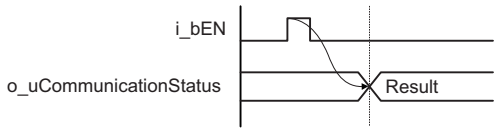
Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	10 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	• Pulse execution (multiple scan execution type) • Always executed

Processing

By turning ON i_bEN (Execution command), the execution status of the FB or the dedicated instruction for the target module is read.

Timing chart of I/O signals



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 dedicated instruction GP.SPBUSY.

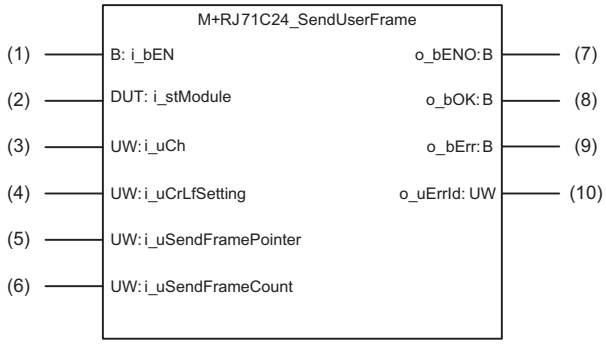
Error code

The error code is the same as the one that generates when the G(P).SPBUSY instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.7 M+RJ71C24_SendUserFrame

Overview

Sends data using the nonprocedural protocol communication and the user frame according to the setting of the user frame specification area for sending data.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uCh	Send channel	Word [Unsigned]/ Bit String [16-bit]	1, 2	Set the channel to which the data is sent. • 1: Channel 1 (CH1 side) • 2: Channel 2 (CH2 side)
(4)	i_uCrLfSetting	Additional specification of CR/LF	Word [Unsigned]/ Bit String [16-bit]	0, 1	Set whether or not to add CR/LF to the send data. • 0: CR/LF is not added. • 1: CR/LF is added.
(5)	i_uSendFramePointer	Send pointer	Word [Unsigned]/ Bit String [16-bit]	1 to 100	Set the position in the user frame specification area from where the frame number data is sent.
(6)	i_uSendFrameCount	Number of outputs	Word [Unsigned]/ Bit String [16-bit]	1 to 100	Set the number of user frames to send.

Output label

No.	Label	Label 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	This label turns ON for one scan when the operation is completed normally.
(9)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(10)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the generated error code.

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	47 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), data is sent using the nonprocedural protocol and the user frame according to the setting of the user frame specification area for sending data.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction GP.PRR.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

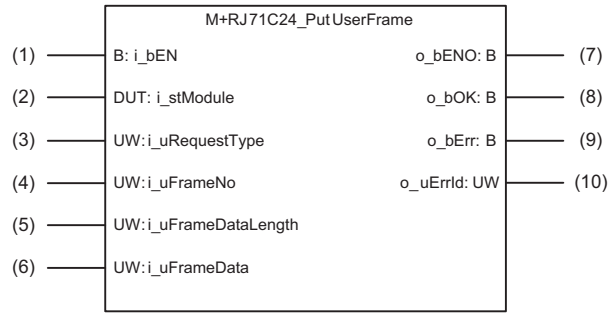
Error code

The error code is the same as the one that generates when the G(P).PRR instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.8 M+RJ71C24_PutUserFrame

Overview

Registers and deletes user frames according to the setting value of the request type.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)

■ Request type = 1: When the user frame is registered

No.	Label	Label name	Data type	Range	Description
(3)	i_uRequestType	Request type	Word [Unsigned]/Bit String [16-bit]	1	When the initial setting is performed using this FB, set Request type = 1.
(4)	i_uFrameNo	Registration frame No.	Word [Unsigned]/Bit String [16-bit]	1000 to 1199	Set the user frame number to be registered.
(5)	i_uFrameDataLength	Number of registration bytes	Word [Unsigned]/Bit String [16-bit]	1 to 80	Set the number of bytes for the user frame to be registered.
(6)	i_uFrameData	Registration frame storage device	Word [Unsigned]/Bit String [16-bit] (0..39)	Shown on the right	Set the data to be registered. When it is specified using the label, use "ARRAY" for the data type.

■ Request type = 3: When the user frame is deleted

No.	Label	Label name	Data type	Range	Description
(3)	i_uRequestType	Request type	Word [Unsigned]/Bit String [16-bit]	3	When the initial setting is performed using this FB, set Request type = 3.
(4)	i_uFrameNo	Registration frame No.	Word [Unsigned]/Bit String [16-bit]	1000 to 1199	Set the user frame number to be registered.
(5)	i_uFrameDataLength	Number of registration bytes	Word [Unsigned]/Bit String [16-bit]	1 to 80	Specify 1 to 80 as a dummy when the frame is deleted.
(6)	i_uFrameData	Registration frame storage device	Word [Unsigned]/Bit String [16-bit] (0..39)	Shown on the right	Specify the same value at the registration. When it is specified using the label, use "ARRAY" for the data type.

Output label

No.	Label	Label 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	This label turns ON for one scan when the operation is completed normally.
(9)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(10)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that has occurred in the FB.

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	50 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), the user frame is registered.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction GP.PUTE.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

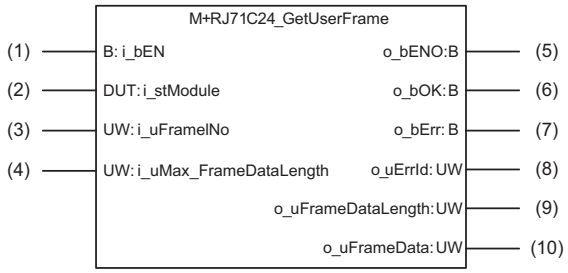
Error code

The error code is the same as the one that generates when the G(P).PUTE instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.9 M+RJ71C24_GetUserFrame

Overview

Reads the user frame.



Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uFrameNo	Read frame No.	Word [Unsigned]/Bit String [16-bit]	1000 to 1199	Set the user frame number to be read.
(4)	i_uMax_FrameDataLength	Read-allowable number of bytes	Word [Unsigned]/Bit String [16-bit]	1 to 80	Set the number of bytes of the read registration data to be stored in the registration data storage device (o_uFrameData).

Output label

No.	Label	Label 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	This label turns ON for one scan when the operation is completed normally.
(7)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(8)	o_uErrId	Error code	Word [Unsigned]/Bit String [16-bit]	0	Stores the error code that has occurred in the FB.
(9)	o_uFrameDataLength	Number of registration bytes	Word [Unsigned]/Bit String [16-bit]	0	Stores the number of bytes of the read registration data.
(10)	o_uFrameData	Registration data storage device	Word [Unsigned]/Bit String [16-bit]	0	Stores the read registration data. The following cannot be specified as an argument. Specifying any of the following may cause a CPU error (2820H: Device/label/buffer memory specification incorrect). • Dynamically specified array elements (Example: wLabel[D0]) • Digit-specified labels (Example: K4bLabel) • Indirectly specified devices (Example: @W0) • Local devices (Example: #D0)

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	46 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), the user frame is read.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction GP.GETE.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

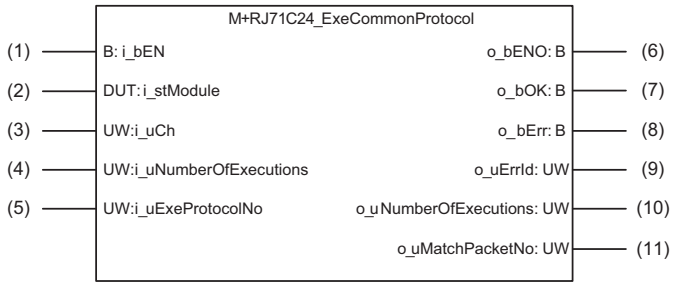
Error code

The error code is the same as the one that generates when the G(P).GETE instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

2.10 M+RJ71C24_ExeCommonProtocol

Overview

Executes the protocol registered with GX Works3.

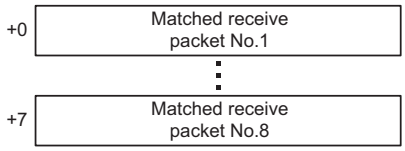


Labels

Input label

No.	Label	Label 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	Structures	—	Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1)
(3)	i_uCh	Communication channel	Word [Unsigned]/Bit String [16-bit]	1, 2	Set the channel to communicate with the external device. • 1: Channel 1 (CH1 side) • 2: Channel 2 (CH2 side)
(4)	i_uNumberOfExecutions	Number of continuous protocol executions	Word [Unsigned]/Bit String [16-bit]	1 to 8	Set the number of continuous executions of the protocol.
(5)	i_uExeProtocolNo	Execution protocol number specification	Word [Unsigned]/Bit String [16-bit] (0..7)	1 to 128, 201 to 207	Set the protocol number or the special protocol number to be executed. Protocols are executed in the specified order of the execution protocol numbers. +0 Execution protocol number specification 1 ⋮ +7 Execution protocol number specification 8 Specify the device or label in which the protocol number to be executed is stored. (Constants cannot be specified.) When it is specified using the label, use "ARRAY" for the data type.

Output label

No.	Label	Label name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(7)	o_bOK	Normal completion	Bit	OFF	This label turns ON for one scan when the operation is completed normally.
(8)	o_bErr	Error completion	Bit	OFF	This label turns ON for one scan when the operation is completed with an error.
(9)	o_uErrId	Error code	Word [Unsigned]/ Bit String [16-bit]	0	Stores the error code that has occurred in the FB.
(10)	o_uNumberOfExecutions	Number of protocol executions	Word [Unsigned]/ Bit String [16-bit]	0	The number of protocol executions is stored. The protocol in which an error has occurred is included in the number of executions. If the setting data and the setting details of the control data are incorrect, 0 is stored.
(11)	o_uMatchPacketNo	Matched receive packet No.	Word [Unsigned]/ Bit String [16-bit] (0..7)	0	 A value is stored in the area corresponding to the execution protocol number. When the communication type of the executed protocol is "Send only" or "Send and receive", the receive packet number that matches with the executed protocol, is stored. In the following cases, 0 is stored. • When the communication type is "Receive only" • When an error occurs in the executed protocol • When a special protocol is used When it is specified using the label, use "ARRAY" for the data type.

FB details

Available device

■ Serial communication module

Module	Engineering tool
RJ71C24, RJ71C24-R2, RJ71C24-R4	GX Works3

■ CPU module

MELSEC iQ-R series CPU modules

Basic specifications

Item	Description
Language	Ladder diagram
Number of basic steps	58 steps The number of steps of the FB embedded in a program depends on the CPU module used, the input/output definitions, and the options setting of GX Works3. For the options setting of GX Works3, refer to the GX Works3 Operating Manual.
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

By turning ON i_bEN (Execution command), the protocol written to the flash ROM using the predefined protocol support function and executing the special protocol.

Timing chart of I/O signals

The operation of the I/O signals is the same as the one for the following FB.

☞ Page 10 M+RJ71C24_SendOndemand

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 dedicated instruction GP.CPRTCL.
- 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) and o_bErr (Error completion) are turned OFF and o_uErrId (Error code) is cleared to 0.

Error code

The error code is the same as the one that generates when the G(P).CPRTCL instruction is used. Refer to MELSEC iQ-R Programming Manual (Module Dedicated Instructions).

MEMO

INSTRUCTION INDEX

M

MEMO

REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
June 2014	BCN-P5999-0379-A	First edition
July 2014	BCN-P5999-0379-B	Partial correction
March 2016	BCN-P5999-0379-C	Partial correction
March 2017	BCN-P5999-0379-D	■Added or modified part Chapter 2
December 2019	BCN-P5999-0379-E	Complete revision (layout change) ■Added or modified part Section 1.2, Section 1.3, Section 2.3, Section 2.5, Section 2.8, Section 2.9, Section 2.10
May 2021	BCN-P5999-0379-F	■Added or modified part CONDITIONS OF USE FOR THE PRODUCT, Section 2.1, Section 2.2, Section 2.3, Section 2.4, Section 2.5, Section 2.9

Japanese manual number: BCN-P5999-0370-F

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BCN-P5999-0379-F(2105)

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