



Programmable Controller

MELSEC iQ-R
series

MELSEC iQ-R Serial Communication Module Function Block Reference

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1 FUNCTION BLOCK (FB) LIST

This chapter lists the FBs for the MELSEC iQ-R series serial communication module.

| Name*1 | 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 Note that this reference does not describe the FB version information which is displayed such as "_00A" at the end of FB name.

2 SERIAL COMMUNICATION MODULE FB

2.1 M+RJ71C24_SendOndemand

Name

M+RJ71C24_SendOndemand

Overview

| Item | Description |
|----------|--|
| Overview | Sends data using the on-demand function of SLMP (MC protocol). |
| Symbol | <p>The diagram shows a box labeled 'M+RJ71C24_SendOndemand' with five input variables on the left and four output variables on the right:</p> <ul style="list-style-type: none"> (1) B:i_bEN (2) DUT:i_stModule (3) UW:i_uCh (4) UW:i_uSendDataLength (5) W:i_uSendData o_bENO:B (6) o_bOK:B (7) o_bErr:B (8) o_uErrId:UW (9) |

Labels

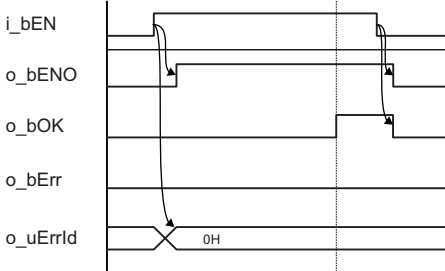
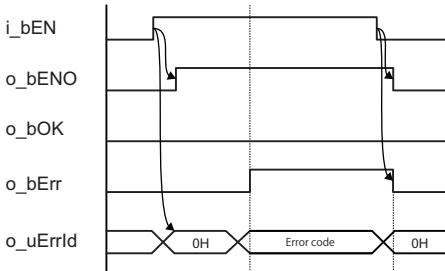
Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|----------------------------|-------------------|---|-----------|---|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Send channel | i_uCh | 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) | Number of send data points | i_uSendDataLength | 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) | Send data storage device | i_uSendData | Word [Unsigned]/ Bit String [16-bit] | — | Set the start address of the device where the send data is stored. |

Output label

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

FB details

| Item | Description | |
|-----------------------------|--|---------------------------------|
| Available device | Target module | RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module | MELSEC iQ-R series CPU modules |
| | Engineering tool | GX Works3 |
| 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. | |
| Processing | By turning ON i_bEN (Execution command), data is sent using the on-demand function of SLMP (MC protocol). | |
| FB compilation method | Macro type | |
| FB operation | Pulse type (multiple scan execution type) | |
| Timing chart of I/O signals | <p>■ In normal completion</p>  <p>■ In error completion (also the same for a module error)</p>  | |
| Restrictions or precautions | <ul style="list-style-type: none"> 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

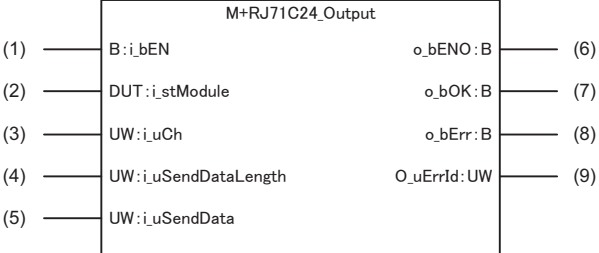
The error code is the same as the one that generates when the G(P).ONDEMAND instruction is used. Refer to MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks).

2.2 M+RJ71C24_Output

Name

M+RJ71C24_Output

Overview

| Item | Description |
|----------|--|
| Overview | Sends the specified data using the nonprocedural protocol. |
| Symbol |  <p>The diagram shows a box labeled 'M+RJ71C24_Output'. On the left side, there are five input variables: (1) B:i_bEN, (2) DUT:i_stModule, (3) UW:i_uCh, (4) UW:i_uSendDataLength, and (5) UW:i_uSendData. On the right side, there are five output variables: (6) o_bENO:B, (7) o_bOK:B, (8) o_bErr:B, and (9) O_uErrId:UW.</p> |

Labels


Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|----------------------------|-------------------|---|-----------|--|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Send channel | i_uCh | 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) | Number of send data points | i_uSendDataLength | 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) | Send data storage device | i_uSendData | Word [Unsigned]/ Bit String [16-bit] | — | Set the start address of the device where the send data is stored. |

Output label

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

FB details

| Item | Description |
|-----------------------------|--|
| Available device | Target module RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module MELSEC iQ-R series CPU modules |
| | Engineering tool GX Works3 |
| 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. |
| Processing | By turning ON i_bEN (Execution command), data is sent in any message format using the nonprocedural protocol. |
| FB compilation method | Macro type |
| FB operation | Pulse execution (multiple scan execution type) |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB.  Page 4 M+RJ71C24_SendOnDemand |
| Restrictions or precautions | <ul style="list-style-type: none"> 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 (Instructions, Standard Functions/Function Blocks).

2.3 M+RJ71C24_Input

Name

M+RJ71C24_Input

Overview

| Item | Description |
|----------|---|
| Overview | Reads the data received using the nonprocedural protocol. |
| Symbol | <p>The diagram shows a box labeled 'M+RJ71C24_Input'. On the left side, there are four input variables: (1) B:i_bEN, (2) DUT:i_stModule, (3) UW:i_uCh, and (4) UW:i_uMaxRecvDataLength. On the right side, there are six output variables: (5) o_bENO:B, (6) o_bOK:B, (7) o_bErr:B, (8) o_uErrId:UW, (9) o_uRecvDataLength:UW, and (10) o_uRecvData:UW.</p> |

Labels


Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|---|----------------------|---|-----------|--|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Receive channel | i_uCh | 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) | Allowable number of receive data points | i_uMaxRecvDataLength | 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. | Name | Variable name | Data type | Default value | Description |
|------|-------------------------------|-------------------|---|---------------|--|
| (5) | Execution status | o_bENO | Bit | OFF | ON: The execution command is ON. OFF: The execution command is OFF. |
| (6) | Normal completion | o_bOK | Bit | OFF | This label turns ON for one scan when the operation is completed normally. |
| (7) | Error completion | o_bErr | Bit | OFF | This label turns ON for one scan when the operation is completed with an error. |
| (8) | Error code | o_uErrId | Word [Unsigned]/ Bit String [16-bit] | 0 | Stores the generated error code. |
| (9) | Number of receive data points | o_uRecvDataLength | Word [Unsigned]/ Bit String [16-bit] | 0 | Set the start address of the device to store the number of receive data points. • Channel 1 (CH1 side): 150 (96H) • Channel 2 (CH2 side): 310 (136H) |
| (10) | Receive data storage device | o_uRecvData | Word [Unsigned]/ Bit String [16-bit] | 0 | Set the start address of the device to store the receive data. |

FB details

| Item | Description |
|-----------------------------|--|
| Available device | Target module RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module MELSEC iQ-R series CPU modules |
| | Engineering tool GX Works3 |
| 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. |
| Processing | By turning ON i_bEN (Execution command), data is received in any message format using the nonprocedural protocol. |
| FB compilation method | Macro type |
| FB operation | Pulse execution (multiple scan execution type) |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB.  Page 4 M+RJ71C24_SendOnDemand |
| Restrictions or precautions | <ul style="list-style-type: none"> 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 (Instructions, Standard Functions/Function Blocks).

2.4 M+RJ71C24_BidirectionalOutput

Name

M+RJ71C24_BidirectionalOutput

Overview

| Item | Description |
|----------|--|
| Overview | Sends the specified data using the bidirectional protocol. |
| Symbol | <p>The diagram shows a box labeled 'M+RJ71C24_BidirectionalOutput'. On the left side, there are five input variables: (1) B:i_bEN, (2) DUT:i_stModule, (3) UW:i_uCh, (4) UW:i_uSendDataLength, and (5) UW:i_uSendData. On the right side, there are four output variables: o_bENO:B (6), o_bOK:B (7), o_bErr:B (8), and o_uErrId:UW (9).</p> |

Labels


Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|----------------------------|-------------------|---|-----------|---|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Send channel | i_uCh | 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) | Number of send data points | i_uSendDataLength | 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) | Send data storage device | i_uSendData | Word [Unsigned]/ Bit String [16-bit] | — | Set the start address of the device where the send data is stored. |

Output label

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

FB details

| Item | Description |
|-----------------------------|--|
| Available device | Target module RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module MELSEC iQ-R series CPU modules |
| | Engineering tool GX Works3 |
| 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. |
| Processing | By turning ON i_bEN (Execution command), data is sent using the bidirectional protocol. |
| FB compilation method | Macro type |
| FB operation | Pulse execution (multiple scan execution type) |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB.  Page 4 M+RJ71C24_SendOnDemand |
| Restrictions or precautions | <ul style="list-style-type: none"> 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 (Instructions, Standard Functions/Function Blocks).

2.5 M+RJ71C24_BidirectionalInput

Name

M+RJ71C24_BidirectionalInput

Overview

| Item | Description |
|----------|--|
| Overview | Reads the data received using the bidirectional protocol. |
| Symbol | <pre> graph LR subgraph M+RJ71C24_BidirectionalInput direction TB i_bEN((1) B:i_bEN) i_stModule((2) DUT:i_stModule) i_uCh((3) UW:i_uCh) i_uMaxRecvDataLength((4) UW:i_uMaxRecvDataLength) o_bENO((5) o_bENO:B) o_bOK((6) o_bOK:B) o_bErr((7) o_bErr:B) o_uErrId((8) o_uErrId:UW) o_uRecvDataLength((9) o_uRecvDataLength:UW) o_uRecvData((10) o_uRecvData:UW) end </pre> |

Labels


Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|---|----------------------|---|-----------|--|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Receive channel | i_uCh | 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) | Allowable number of receive data points | i_uMaxRecvDataLength | 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. | Name | Variable name | Data type | Default value | Description |
|------|-------------------------------|-------------------|---|---------------|--|
| (5) | Execution status | o_bENO | Bit | OFF | ON: The execution command is ON. OFF: The execution command is OFF. |
| (6) | Normal completion | o_bOK | Bit | OFF | This label turns ON for one scan when the operation is completed normally. |
| (7) | Error completion | o_bErr | Bit | OFF | This label turns ON for one scan when the operation is completed with an error. |
| (8) | Error code | o_uErrId | Word [Unsigned]/ Bit String [16-bit] | 0 | Stores the generated error code. |
| (9) | Number of receive data points | o_uRecvDataLength | Word [Unsigned]/ Bit String [16-bit] | 0 | Set the start address of the device to store the number of receive data points. • Channel 1 (CH1 side): 150 (96H) • Channel 2 (CH2 side): 310 (136H) |
| (10) | Receive data storage device | o_uRecvData | Word [Unsigned]/ Bit String [16-bit] | 0 | Set the start address of the device to store the receive data. |

FB details

| Item | Description |
|-----------------------------|--|
| Available device | Target module RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module MELSEC iQ-R series CPU modules |
| | Engineering tool GX Works3 |
| 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. |
| Processing | By turning ON i_bEN (Execution command), data is received in any message format using the bidirectional protocol. |
| FB compilation method | Macro type |
| FB operation | Pulse execution (multiple scan execution type) |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB.  Page 4 M+RJ71C24_SendOnDemand |
| Restrictions or precautions | <ul style="list-style-type: none"> 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 (Instructions, Standard Functions/Function Blocks).

2.6 M+RJ71C24_ReadInstructionBusy

Name

M+RJ71C24_ReadInstructionBusy

Overview

| Item | Description |
|----------|--|
| Overview | Reads the transmission status of the data sent/received using the dedicated instructions or FBs. |
| Symbol | <pre> graph LR subgraph M+RJ71C24_ReadInstructionBusy B["B:i_bEN"] DUT["DUT:i_stModule"] o_u["o_uCommunicationStatus:UW"] end (1) --- B (2) --- DUT o_u --- (3) </pre> |

Labels

■Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|-------------------|---------------|------------|-------|---|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |

■Output label

| No. | Name | Variable name | Data type | Default value | Description |
|-----|------------------------------------|------------------------|---|---------------|--|
| (3) | Transmission status storage device | o_uCommunicationStatus | Word [Unsigned]/ Bit String [16-bit] | 0 | <p>When the processing using each instruction starts, '1' is stored in the corresponding bit. When the processing is completed, '0' is stored.</p> <p>The following shows the timing when the processing of each instruction is completed.</p> <ul style="list-style-type: none"> • FB: The execution status is turned ON and OFF. • Dedicated instruction: The completed flag is turned ON and OFF. <p>■1st word</p> <ul style="list-style-type: none"> • 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'. <p>■2nd word</p> <ul style="list-style-type: none"> • b0 to b15: Always stores '0'. |

FB details

| Item | Description | |
|-----------------------------|--|---------------------------------|
| Available device | Target module | RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module | MELSEC iQ-R series CPU modules |
| | Engineering tool | GX Works3 |
| 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. | |
| Processing | By turning ON i_bEN (Execution command), the execution status of the FB or the dedicated instruction for the target module is read. | |
| FB compilation method | Macro type | |
| FB operation | <ul style="list-style-type: none"> Pulse execution (multiple scan execution type) Always executed | |
| Timing chart of I/O signals | <p>The timing chart shows three signals: i_bEN, o_uCommunicationStatus, and Result. i_bEN is a pulse that starts before o_uCommunicationStatus. o_uCommunicationStatus is a signal that transitions from high to low. Result is a signal that transitions from high to low after o_uCommunicationStatus has transitioned. A vertical dashed line marks the point where o_uCommunicationStatus transitions to low, and Result transitions to low.</p> | |
| Restrictions or precautions | <ul style="list-style-type: none"> 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 (Instructions, Standard Functions/Function Blocks).

2.7 M+RJ71C24_SendUserFrame

Name

M+RJ71C24_SendUserFrame

Overview

| Item | Description |
|----------|---|
| 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. |
| Symbol | <p>The diagram shows a rectangular box labeled 'M+RJ71C24_SendUserFrame'. On the left side, there are six input variables: (1) B:i_bEN, (2) DUT:i_stModule, (3) UW:i_uCh, (4) UW:i_uCrLfSetting, (5) UW:i_uSendFramePointer, and (6) UW:i_uSendFrameCount. On the right side, there are four output variables: (7) o_bENO:B, (8) o_bOK:B, (9) o_bErr:B, and (10) o_uErrId:UW.</p> |

Labels


Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|-----------------------------------|---------------------|---|----------|---|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Send channel | i_uCh | 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) | Additional specification of CR/LF | i_uCrLfSetting | 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) | Send pointer | i_uSendFramePointer | 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) | Number of outputs | i_uSendFrameCount | Word [Unsigned]/ Bit String [16-bit] | 1 to 100 | Set the number of user frames to send. |

Output label

| No. | Name | Variable name | Data type | Default value | Description |
|------|-------------------|---------------|---|---------------|---|
| (7) | Execution status | o_bENO | Bit | OFF | ON: The execution command is ON. OFF: The execution command is OFF. |
| (8) | Normal completion | o_bOK | Bit | OFF | This label turns ON for one scan when the operation is completed normally. |
| (9) | Error completion | o_bErr | Bit | OFF | This label turns ON for one scan when the operation is completed with an error. |
| (10) | Error code | o_uErrId | Word [Unsigned]/ Bit String [16-bit] | 0 | Stores the generated error code. |

FB details

| Item | Description |
|-----------------------------|---|
| Available device | Target module RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module MELSEC iQ-R series CPU modules |
| | Engineering tool GX Works3 |
| 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. |
| 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. |
| FB compilation method | Macro type |
| FB operation | Pulse execution (multiple scan execution type) |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB.  Page 4 M+RJ71C24_SendOndemand |
| Restrictions or precautions | <ul style="list-style-type: none"> • 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 (Instructions, Standard Functions/Function Blocks).

2.8 M+RJ71C24_PutUserFrame

Name

M+RJ71C24_PutUserFrame

Overview

| Item | Description |
|----------|--|
| Overview | Registers and deletes user frames according to the setting value of the request type. |
| Symbol | <pre> graph LR subgraph M+RJ71C24_PutUserFrame B["B:i_bEN"] DUT["DUT:i_stModule"] UW1["UW:i_uRequestType"] UW2["UW:i_uFrameNo"] UW3["UW:i_uFrameDataLength"] UW4["UW:i_uFrameData"] o_bENO["o_bENO:B"] o_bOK["o_bOK:B"] o_bErr["o_bErr:B"] o_uErrId["o_uErrId:UW"] end B --- o_bENO DUT --- o_bOK UW1 --- o_bErr UW2 --- o_uErrId UW3 --- o_uErrId UW4 --- o_uErrId </pre> |

Labels

■Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|-------------------|---------------|------------|-------|---|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | 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. | Name | Variable name | Data type | Range | Description |
|-----|-----------------------------------|--------------------|--|--------------------|--|
| (3) | Request type | i_uRequestType | Word [Unsigned]/ Bit String [16-bit] | 1 | When the initial setting is performed using this FB, set Request type = 1. |
| (4) | Registration frame No. | i_uFrameNo | Word [Unsigned]/ Bit String [16-bit] | 1000 to 1199 | Set the user frame number to be registered. |
| (5) | Number of registration bytes | i_uFrameDataLength | Word [Unsigned]/ Bit String [16-bit] | 1 to 80 | Set the number of bytes for the user frame to be registered. |
| (6) | Registration frame storage device | i_uFrameData | 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. | Name | Variable name | Data type | Range | Description |
|-----|-----------------------------------|--------------------|--|--------------------|---|
| (3) | Request type | i_uRequestType | Word [Unsigned]/ Bit String [16-bit] | 3 | When the initial setting is performed using this FB, set Request type = 3. |
| (4) | Registration frame No. | i_uFrameNo | Word [Unsigned]/ Bit String [16-bit] | 1000 to 1199 | Set the user frame number to be registered. |
| (5) | Number of registration bytes | i_uFrameDataLength | Word [Unsigned]/ Bit String [16-bit] | 1 to 80 | Specify 1 to 80 as a dummy when the frame is deleted. |
| (6) | Registration frame storage device | i_uFrameData | 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. | Name | Variable name | Data type | Default value | Description |
|-----|------------------|---------------|-----------|---------------|--|
| (7) | Execution status | o_bENO | Bit | OFF | ON: The execution command is ON. OFF: The execution command is OFF. |

| No. | Name | Variable name | Data type | Default value | Description |
|------|-------------------|---------------|---|---------------|---|
| (8) | Normal completion | o_bOK | Bit | OFF | This label turns ON for one scan when the operation is completed normally. |
| (9) | Error completion | o_bErr | Bit | OFF | This label turns ON for one scan when the operation is completed with an error. |
| (10) | Error code | o_uErrId | Word [Unsigned]/ Bit String [16-bit] | 0 | Stores the error code that has occurred in the FB. |

FB details

| Item | Description | |
|-----------------------------|--|---------------------------------|
| Available device | Target module | RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module | MELSEC iQ-R series CPU modules |
| | Engineering tool | GX Works3 |
| 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. | |
| Processing | By turning ON i_bEN (Execution command), the user frame is registered. | |
| FB compilation method | Macro type | |
| FB operation | Pulse execution (multiple scan execution type) | |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB.  Page 4 M+RJ71C24_SendOndemand | |
| Restrictions or precautions | <ul style="list-style-type: none"> 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 (Instructions, Standard Functions/Function Blocks).

2.9 M+RJ71C24_GetUserFrame

Name

M+RJ71C24_GetUserFrame

Overview

| Item | Description |
|----------|-----------------------|
| Overview | Reads the user frame. |
| Symbol | |

Labels


■Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|--------------------------------|----------------------|---|--------------|--|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Read frame No. | i_FrameNo | Word [Unsigned]/ Bit String [16-bit] | 1000 to 1199 | Set the user frame number to be read. |
| (4) | Read-allowable number of bytes | i_MaxFrameDataLength | 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. | Name | Variable name | Data type | Default value | Description |
|------|----------------------------------|--------------------|---|---------------|---|
| (5) | Execution status | o_bENO | Bit | OFF | ON: The execution command is ON. OFF: The execution command is OFF. |
| (6) | Normal completion | o_bOK | Bit | OFF | This label turns ON for one scan when the operation is completed normally. |
| (7) | Error completion | o_bErr | Bit | OFF | This label turns ON for one scan when the operation is completed with an error. |
| (8) | Error code | o_uErrId | Word [Unsigned]/ Bit String [16-bit] | 0 | Stores the error code that has occurred in the FB. |
| (9) | Number of registration bytes | o_uFrameDataLength | Word [Unsigned]/ Bit String [16-bit] | 0 | Set the start address of the device to store the number of bytes of the read registration data. |
| (10) | Registration data storage device | o_uFrameData | Word [Unsigned]/ Bit String [16-bit] | 0 | Set the start address of the device to store the read registration data. |

FB details

| Item | Description |
|-----------------------------|--|
| Available device | Target module RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module MELSEC iQ-R series CPU modules |
| | Engineering tool GX Works3 |
| 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. |
| Processing | By turning ON i_bEN (Execution command), the user frame is read. |
| FB compilation method | Macro type |
| FB operation | Pulse execution (multiple scan execution type) |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB.  Page 4 M+RJ71C24_SendOnDemand |
| Restrictions or precautions | <ul style="list-style-type: none"> 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 (Instructions, Standard Functions/Function Blocks).

2.10 M+RJ71C24_ExecCommonProtocol

Name

M+RJ71C24_ExecCommonProtocol

Overview

| Item | Description |
|----------|---|
| Overview | Executes the protocol registered with GX Works3. |
| Symbol | <p>The diagram shows a box labeled 'M+RJ71C24_ExecCommonProtocol'. On the left side, there are five input variables: (1) B:i_bEN, (2) DUT:i_stModule, (3) UW:i_uCh, (4) UW:i_uNumberOfExecutions, and (5) UW:i_uExeProtocolNo. On the right side, there are five output variables: (6) o_bENO:B, (7) o_bOK:B, (8) o_bErr:B, (9) o_uErrId:UW, and (10) o_uNumberOfExecutions:UW. Below the box, there is an additional output variable (11) o_uMatchPacketNo:UW.</p> |

Labels

Input label

| No. | Name | Variable name | Data type | Range | Description |
|-----|--|-----------------------|---|----------------------|--|
| (1) | Execution command | i_bEN | Bit | — | ON: The FB is activated. OFF: The FB is not activated. |
| (2) | Module label | i_stModule | Structures | — | Specify the module to execute this FB. Specify the module label of relevant modules. (example: C24_1) |
| (3) | Communication channel | i_uCh | 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) | Number of continuous protocol executions | i_uNumberOfExecutions | Word [Unsigned]/ Bit String [16-bit] | 1 to 8 | Set the number of continuous executions of the protocol. |
| (5) | Execution protocol number specification | i_uExeProtocolNo | 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. <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> +0 Execution protocol number specification 1 ⋮ +7 Execution protocol number specification 8 </div> When it is specified using the label, use "ARRAY" for the data type. |

Output label

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

| No. | Name | Variable name | Data type | Default value | Description |
|------|-------------------------------|-----------------------|---|---------------|--|
| (10) | Number of protocol executions | o_uNumberOfExecutions | 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) | Matched receive packet No. | o_uMatchPacketNo | Word [Unsigned]/ Bit String [16-bit] (0..7) | 0 | <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">+0</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Matched receive packet No.1</div> </div> <div style="text-align: center; margin: 5px 0;">⋮</div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">+7</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Matched receive packet No.8</div> </div> <p>A value is stored in the area corresponding to the execution protocol number.</p> <p>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.</p> <p>In the following cases, 0 is stored.</p> <ul style="list-style-type: none"> • When the communication type is "Receive only" • When an error occurs in the executed protocol • When a special protocol is used <p>When it is specified using the label, use "ARRAY" for the data type.</p> |

FB details

| Item | Description | |
|-----------------------------|--|---------------------------------|
| Available device | Target module | RJ71C24, RJ71C24-R2, RJ71C24-R4 |
| | CPU module | MELSEC iQ-R series CPU modules |
| | Engineering tool | GX Works3 |
| 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. | |
| 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. | |
| FB compilation method | Macro type | |
| FB operation | Pulse execution (multiple scan execution type) | |
| Timing chart of I/O signals | The operation of the I/O signals is the same as the one for the following FB. Page 4 M+RJ71C24_SendOnDemand | |
| Restrictions or precautions | <ul style="list-style-type: none"> • 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 (Instructions, Standard Functions/Function Blocks).

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