

Programmable Controller

**MELSEC iQ-R**  
series

## MELSEC iQ-R CPU Module Function Block Reference

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# CONTENTS

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<b>CHAPTER 1</b>	<b>FUNCTION BLOCK (FB) LIST</b>	<b>2</b>
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<b>CHAPTER 2</b>	<b>CPU MODULE FB</b>	<b>4</b>
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2.1	M+RCPU_MSynchroization_Delay1OUT, M+RCPU_MSynchroization_Delay2OUT .....	4
2.2	M+RCPU_MSynchroization_Delay1SET, M+RCPU_MSynchroization_Delay2SET .....	6
2.3	M+RCPU_MSynchroization_Delay1RST, M+RCPU_MSynchroization_Delay2RST .....	8
2.4	M+RCPU_MSynchroization_Delay1MOV, M+RCPU_MSynchroization_Delay2MOV .....	10
2.5	M+RCPU_MSynchroization_Delay1DMOV, M+RCPU_MSynchroization_Delay2DMOV .....	12

---

<b>INSTRUCTION INDEX</b>	<b>15</b>
--------------------------	-----------

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REVISIONS .....	17
TRADEMARKS .....	18

# 1 FUNCTION BLOCK (FB) LIST

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


## FBs for the Ethernet function

For the Ethernet function FBs of CPU modules, refer to the "Ethernet-EQUIPPED MODULE FB" in the following.

 MELSEC iQ-R Ethernet/CC-Link IE Function Block Reference


## FBs for the inter-module synchronization function

Use this FB when the inter-module synchronization function is used.\*2 For the function, refer to the following.

 MELSEC iQ-R Inter-Module Synchronization Function Reference Manual

Name*1	Description
M+RCPU_MSynchronization_Delay1OUT M+RCPU_MSynchronization_Delay2OUT	M+RCPU_MSynchronization_Delay1OUT holds the value specified by input data (output request data) in the FB and executes the OUT instruction when the FB is called next. M+RCPU_MSynchronization_Delay2OUT executes the OUT instruction when the FB is called second time.
M+RCPU_MSynchronization_Delay1SET M+RCPU_MSynchronization_Delay2SET	M+RCPU_MSynchronization_Delay1SET memorizes that this function has been called by the FB and executes the SET instruction when the FB is called next. M+RCPU_MSynchronization_Delay2SET executes the SET instruction when the FB is called second time.
M+RCPU_MSynchronization_Delay1RST M+RCPU_MSynchronization_Delay2RST	M+RCPU_MSynchronization_Delay1RST memorizes that this function has been called by the FB and executes the RST instruction when the FB is called next. M+RCPU_MSynchronization_Delay2RST executes the RST instruction when the FB is called second time.
M+RCPU_MSynchronization_Delay1MOV M+RCPU_MSynchronization_Delay2MOV	M+RCPU_MSynchronization_Delay1MOV holds the value specified by input data in the FB and executes the MOV instruction when the FB is called next. M+RCPU_MSynchronization_Delay2MOV executes the MOV instruction when the FB is called second time.
M+RCPU_MSynchronization_Delay1DMOV M+RCPU_MSynchronization_Delay2DMOV	M+RCPU_MSynchronization_Delay1DMOV holds the value specified by input data in the FB and executes the DMOV instruction when the FB is called next. M+RCPU_MSynchronization_Delay2DMOV executes the DMOV instruction when the FB is called second time.

\*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 The RCPU that supports the inter-module synchronization function can be used. ( MELSEC iQ-R CPU Module User's Manual (Startup))



# 2 CPU MODULE FB

## 2.1 M+RCPU\_MSynchronization\_Delay1OUT, M+RCPU\_MSynchronization\_Delay2OUT

### Name

M+RCPU\_MSynchronization\_Delay1OUT, M+RCPU\_MSynchronization\_Delay2OUT

### Overview

Item	Description
Functional overview	Holds the value specified by output request data (input data) in the FB and executes the OUT instruction when the FB is called next or the second time.
Symbol	<p>The diagram shows two function blocks stacked vertically. The top block is labeled 'M+RCPU_MSynchronization_Delay1OUT' and the bottom block is labeled 'M+RCPU_MSynchronization_Delay2OUT'. Both blocks have an input on the left labeled '(1) B: i_bData' and an output on the right labeled '(2) o_bData: B'.</p>

### Labels

#### ■Input label

No.	Variable name	Name	Data type	Range	Default value	Description
(1)	i_bData	Output request data	Bit	On or off	None	Specifies output data. On: Requesting output on Off: Requesting output off

#### ■Output label

No.	Variable name	Name	Data type	Range	Description
(2)	o_bData	Output data	Bit	On or off	Output data are set.

## FB details

Item	Description	
Available devices	CPU module	RCPU* <sup>1</sup>
	Engineering tool	GX Works3
Language	Ladder diagram	
Number of basic steps	12 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	Holds the output request data (bit) specified by i_bData in the FB and outputs it to o_bData when the FB is called next or the second time. M+RCPU_MSynchronization_Delay1OUT outputs data when the FB is called next. M+RCPU_MSynchronization_Delay2OUT outputs data when the FB is called second time.	
FB compilation method	Macro type	
FB operation	Always executed	
Input condition for FB_EN	None	
Timing chart of I/O signals	<p>■ M+RCPU_MSynchronization_Delay1OUT</p> <p>The timing chart shows two signals: i_bData and o_bData. i_bData is a step function that changes at each of the four FB call timings (marked with vertical dashed lines). o_bData is a signal that remains low until the first FB call, then rises to a high level and decays back to low. The decay time is longer for subsequent FB calls. Arrows point from the text 'M+RCPU_MSynchronization_Delay1OUT' to the rising edge of o_bData at the first FB call.</p> <ul style="list-style-type: none"> <li>• FB: FB call timing</li> <li>* M+RCPU_MSynchronization_Delay2OUT outputs data at the second FB call timing after FB is once called.</li> </ul>	
Restrictions or precautions	• Always outputs OFF by the number of Delays after the status of the CPU module is changed from STOP to RUN.	

\*1 The RCPU that supports the inter-module synchronization function can be used. (📖 MELSEC iQ-R CPU Module User's Manual (Startup))

## Error code

There is no error code.

## 2.2 M+RCPU\_MSynchronization\_Delay1SET, M+RCPU\_MSynchronization\_Delay2SET

### Name

M+RCPU\_MSynchronization\_Delay1SET, M+RCPU\_MSynchronization\_Delay2SET

### Overview

Item	Description
Functional overview	Memorizes that this function has been called by the FB and executes the SET instruction when the FB is called next or the second time.
Symbol	<p>The diagram shows two function blocks stacked vertically. The top block is labeled 'M+RCPU_MSynchronization_Delay1SET' and the bottom block is labeled 'M+RCPU_MSynchronization_Delay2SET'. Both blocks have an input on the left labeled '(1) B: i_bEN' and an output on the right labeled '(2) o_bData: B'.</p>

### Labels

#### ■Input label

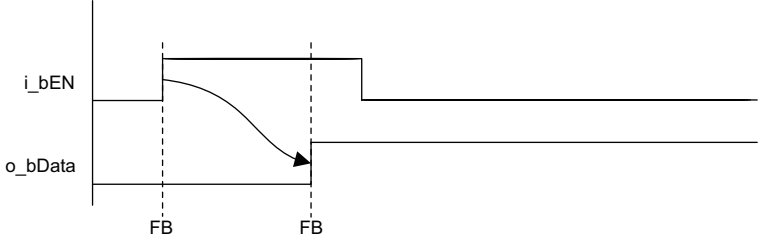
No.	Variable name	Name	Data type	Range	Default value	Description
(1)	i_bEN	Execution command	Bit	On or off	None	On: FB starts. Off: FB does not start.

#### ■Output label

No.	Variable name	Name	Data type	Range	Description
(2)	o_bData	Output data	Bit	On or off	Output data are set.



## FB details

Item	Description	
Available devices	CPU module	RCPU* <sup>1</sup>
	Engineering tool	GX Works3
Language	Ladder diagram	
Number of basic steps	12 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	When i_bEN is turned on, the function holds the state in the FB and sets it in o_bData when the FB is called next or the second time. M+RCPU_MSynchronization_Delay1SET is set when the FB is called next. M+RCPU_MSynchronization_Delay2SET is set when the FB is called second time.	
FB compilation method	Macro type	
FB operation	Always executed	
Input condition for FB_EN	None	
Timing chart of I/O signals	<p>■ M+RCPU_MSynchronization_Delay1SET</p>  <p>• FB: FB call timing * M+RCPU_MSynchronization_Delay2SET sets the device at the second FB call timing after FB is once called.</p>	
Restrictions or precautions	• Holds the output by the number of Delays after the status of the CPU module is changed from STOP to RUN.	

\*1 The RCPU that supports the inter-module synchronization function can be used. (📖 MELSEC iQ-R CPU Module User's Manual (Startup))

## Error code

There is no error code.

## 2.3 M+RCPU\_MSynchronization\_Delay1RST, M+RCPU\_MSynchronization\_Delay2RST

### Name

M+RCPU\_MSynchronization\_Delay1RST, M+RCPU\_MSynchronization\_Delay2RST

### Overview

Item	Description
Functional overview	Memorizes that this function has been called by the FB and executes the RST instruction when the FB is called next or the second time.
Symbol	<p>The diagram shows two function blocks stacked vertically. The top block is labeled 'M+RCPU_MSynchronization_Delay1RST' and the bottom block is labeled 'M+RCPU_MSynchronization_Delay2RST'. Both blocks have an input on the left labeled '(1) B: i_bEN' and an output on the right labeled '(2) o_bData: B'.</p>

### Labels

#### ■ Input label

No.	Variable name	Name	Data type	Range	Default value	Description
(1)	i_bEN	Execution command	Bit	On or off	None	On: FB starts. Off: FB does not start.

#### ■ Output label

No.	Variable name	Name	Data type	Range	Description
(2)	o_bData	Output data	Bit	On or off	Output data are set.

## FB details

Item	Description	
Available devices	CPU module	RCPU* <sup>1</sup>
	Engineering tool	GX Works3
Language	Ladder diagram	
Number of basic steps	12 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	When i_bEN is turned on, the function holds the state in the FB and resets o_bData when the FB is called next or the second time. M+RCPU_MSynchronization_Delay1RST resets the device when the FB is called next. M+RCPU_MSynchronization_Delay2RST resets the device when the FB is called second time.	
FB compilation method	Macro type	
FB operation	Always executed	
Input condition for FB_EN	None	
Timing chart of I/O signals	<p>■ M+RCPU_MSynchronization_Delay1RST</p> <p>• FB: FB call timing * M+RCPU_MSynchronization_Delay2RST resets the device at the second FB call timing after FB is once called.</p>	
Restrictions or precautions	• Holds the output by the number of Delays after the status of the CPU module is changed from STOP to RUN.	

\*1 The RCPU that supports the inter-module synchronization function can be used. (📖 MELSEC iQ-R CPU Module User's Manual (Startup))

## Error code

There is no error code.

## 2.4 M+RCPU\_MSynchronization\_Delay1MOV, M+RCPU\_MSynchronization\_Delay2MOV

### Name

M+RCPU\_MSynchronization\_Delay1MOV, M+RCPU\_MSynchronization\_Delay2MOV

### Overview

Item	Description
Functional overview	Holds the value specified by transfer source data (input data) in the FB and executes the MOV instruction when the FB is called next or the second time.
Symbol	

### Labels

#### ■Input labels

No.	Variable name	Name	Data type	Range	Default value	Description
(1)	i_bEN	Execution command	Bit	On or off	None	On: FB starts. Off: FB does not start.
(2)	i_wData	Transfer source data	Word [signed]	Effective device range	None	Specify the transfer source data or the device containing the transfer source data.

#### ■Output label

No.	Variable name	Name	Data type	Range	Description
(3)	o_wData	Transfer destination data	Word [signed]	Effective device range	Transfer data is stored.

## FB details

Item	Description	
Available devices	CPU module	RCPU* <sup>1</sup>
	Engineering tool	GX Works3
Language	Ladder diagram	
Number of basic steps	<ul style="list-style-type: none"> <li>• 18 steps (M+RCPU_MSynchronization_Delay1MOV)</li> <li>• 20 steps (M+RCPU_MSynchronization_Delay2MOV)</li> </ul> <p>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.</p>	
Processing	<p>When i_bEN is turned on, the function transfers the data specified by i_wData to o_wData in 16-bit data transfer mode when the FB is called next or the second time.</p> <p>M+RCPU_MSynchronization_Delay1MOV transfers data when the FB is called next.</p> <p>M+RCPU_MSynchronization_Delay2MOV transfers data when the FB is called second time.</p>	
FB compilation method	Macro type	
FB operation	Always executed	
Input condition for FB_EN	None	
Timing chart of I/O signals	<p>■ M+RCPU_MSynchronization_Delay1MOV</p> <p>• FB: FB call timing</p> <p>* M+RCPU_MSynchronization_Delay2MOV transfers data at the second FB calling after FB is once called.</p>	
Restrictions or precautions	<ul style="list-style-type: none"> <li>• Holds the output by the number of Delays after the status of the CPU module is changed from STOP to RUN.</li> </ul>	

\*1 The RCPU that supports the inter-module synchronization function can be used. (MELSEC iQ-R CPU Module User's Manual (Startup))

## Error code

There is no error code.

## 2.5 M+RCPU\_MSynchronization\_Delay1DMOV, M+RCPU\_MSynchronization\_Delay2DMOV

### Name

M+RCPU\_MSynchronization\_Delay1DMOV, M+RCPU\_MSynchronization\_Delay2DMOV

### Overview

Item	Description
Functional overview	Holds the value specified by transfer source data (input data) in the FB and executes the DMOV instruction when the FB is called next or the second time.
Symbol	<p>The diagram shows two function blocks, M+RCPU_MSynchronization_Delay1DMOV and M+RCPU_MSynchronization_Delay2DMOV. Each block has two inputs on the left: (1) B: i_bEN and (2) D: i_dData. Each block has one output on the right: (3) o_dData: D.</p>

### Labels

#### ■ Input labels

No.	Variable name	Name	Data type	Range	Default value	Description
(1)	i_bEN	Execution command	Bit	On or off	None	On: FB starts. Off: FB does not start.
(2)	i_dData	Transfer source data	Double word [signed]	Effective device range	None	Specify the transfer source data or the device containing the transfer source data.

#### ■ Output label

No.	Variable name	Name	Data type	Range	Description
(3)	o_dData	Transfer destination data	Double word [signed]	Effective device range	Transfer data is stored.

## FB details

Item	Description	
Available devices	CPU module	RCPU* <sup>1</sup>
	Engineering tool	GX Works3
Language	Ladder diagram	
Number of basic steps	<ul style="list-style-type: none"> <li>• 18 steps (M+RCPU_MSynchronization_Delay1DMOV)</li> <li>• 20 steps (M+RCPU_MSynchronization_Delay2DMOV)</li> </ul> <p>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.</p>	
Processing	<p>When i_bEN is turned on, the function transfers the data specified by i_dData to o_dData in 32-bit data transfer mode when the FB is called next or the second time.</p> <p>M+RCPU_MSynchronization_Delay1DMOV transfers data when the FB is called next.</p> <p>M+RCPU_MSynchronization_Delay2DMOV transfers data when the FB is called second time.</p>	
FB compilation method	Macro type	
FB operation	Always executed	
Input condition for FB_EN	None	
Timing chart of I/O signals	<p>■ M+RCPU_MSynchronization_Delay1DMOV</p> <p>• FB: FB call timing</p> <p>* M+RCPU_MSynchronization_Delay2DMOV transfers data at the second FB calling after FB is once called.</p>	
Restrictions or precautions	<ul style="list-style-type: none"> <li>• Holds the output by the number of Delays after the status of the CPU module is changed from STOP to RUN.</li> </ul>	

\*1 The RCPU that supports the inter-module synchronization function can be used. (MELSEC iQ-R CPU Module User's Manual (Startup))

## Error code

There is no error code.

# MEMO

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# INSTRUCTION INDEX

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## M

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M+RCPU_MSynchroization_Delay1DMOV . . . .	12
M+RCPU_MSynchroization_Delay1MOV . . . . .	10
M+RCPU_MSynchroization_Delay1OUT . . . . .	4
M+RCPU_MSynchroization_Delay1RST . . . . .	8
M+RCPU_MSynchroization_Delay1SET . . . . .	6
M+RCPU_MSynchroization_Delay2DMOV . . . .	12
M+RCPU_MSynchroization_Delay2MOV . . . . .	10
M+RCPU_MSynchroization_Delay2OUT . . . . .	4
M+RCPU_MSynchroization_Delay2RST . . . . .	8
M+RCPU_MSynchroization_Delay2SET . . . . .	6



# MEMO

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# REVISIONS

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## **mitsubishi electric corporation**

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN  
NAGOYA WORKS : 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA, JAPAN

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