# CONTENTS

## CHAPTER 1 FUNCTION BLOCK (FB) LIST

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</tbody>
</table>

## CHAPTER 2 I/O MODULE FB

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## INSTRUCTION INDEX

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This chapter lists the FBs for the MELSEC iQ-R series I/O module.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M+model_ReadOutputOnTimes</td>
<td>Reads the number of the relay ON times of the specified module and relay device number.</td>
</tr>
<tr>
<td>M+model_CompareRelayOnTimes</td>
<td>Reads the number of relay ON times, compares the value with the setting value, and turns on a device according to the comparison result.</td>
</tr>
<tr>
<td>M+RX40NC6B_SaveEventTime</td>
<td>Collects event time stamp data and stores the data in CSV files.</td>
</tr>
</tbody>
</table>

*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 When using this FB, set "Target" to "Module Label" in the refresh setting.
### I/O MODULE FB

#### 2.1 M+model_ReadOutputOnTimes

**Name**

- **RY10R2**
  - M+RY10R2_ReadOutputOnTimes
- **RY10R2-TS**
  - M+RY10R2_TS_ReadOutputOnTimes
- **RY18R2A**
  - M+RY18R2A_ReadOutputOnTimes

**Overview**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional overview</td>
<td>Reads the number of the relay ON times of the specified module and relay device number.</td>
</tr>
</tbody>
</table>

**Symbol**

1. (1) \( i_bEN \) Execution command Bit On or off On: The FB is activated. Off: The FB is not activated.
2. (2) \( i_{stModule} \) Module label Structure The setting range differs depending on the module label. Specify the module label of the contact output module.
3. (3) \( i_uRaNo \) Target relay device number Word [Unsigned] 0H to FH Specify the relay device number to read the number of ON times. (For example, when output Y*0 is read, specify 0H.)

**Labels**

**Input labels**

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable name</th>
<th>Name</th>
<th>Data type</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>( i_bEN )</td>
<td>Execution command</td>
<td>Bit</td>
<td>On or off</td>
<td>On: The FB is activated. Off: The FB is not activated.</td>
</tr>
<tr>
<td>(2)</td>
<td>( i_{stModule} )</td>
<td>Module label</td>
<td>Structure</td>
<td></td>
<td>Specify the module label of the contact output module.</td>
</tr>
<tr>
<td>(3)</td>
<td>( i_uRaNo )</td>
<td>Target relay device number</td>
<td>Word [Unsigned]</td>
<td>0H to FH</td>
<td>Specify the relay device number to read the number of ON times. (For example, when output Y*0 is read, specify 0H.)</td>
</tr>
</tbody>
</table>

**Output labels**

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable name</th>
<th>Name</th>
<th>Data type</th>
<th>Default value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4)</td>
<td>( o_bENO )</td>
<td>Execution status</td>
<td>Bit</td>
<td>Off</td>
<td>On: The execution command is on. Off: The execution command is off.</td>
</tr>
<tr>
<td>(5)</td>
<td>( o_{udOutputOnTotal} )</td>
<td>Integration value of No. of relay ON times</td>
<td>Double Word [Unsigned]</td>
<td>0</td>
<td>The integration value of the number of relay ON times of the specified target module and relay device number is read.</td>
</tr>
<tr>
<td>(6)</td>
<td>( o_bOK )</td>
<td>Normal completion</td>
<td>Bit</td>
<td>Off</td>
<td>When this label is on, it indicates that reading the number of relay ON times has been completed successfully.</td>
</tr>
<tr>
<td>(7)</td>
<td>( o_bErr )</td>
<td>Error completion</td>
<td>Bit</td>
<td>Off</td>
<td>When this label is on, it indicates that an error has occurred in the FB.</td>
</tr>
<tr>
<td>(8)</td>
<td>( o_uErrId )</td>
<td>Error code</td>
<td>Word [Unsigned]</td>
<td>0</td>
<td>The error code of an error that occurred in the FB is stored.</td>
</tr>
</tbody>
</table>
### FB details

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available devices</td>
<td>Target module: RY10R2, RY18R2A</td>
</tr>
<tr>
<td></td>
<td>CPU modules: MELSEC iQ-R series CPU modules</td>
</tr>
<tr>
<td></td>
<td>Engineering tool: GX Works3</td>
</tr>
<tr>
<td>Language</td>
<td>Ladder diagram</td>
</tr>
<tr>
<td>Number of basic steps</td>
<td>53 steps</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Processing</td>
<td>• The integration value of the number of relay ON times specified with i_uRaNo (Target relay device number) of the module specified with i_stModule (Module label) is output to o_udOutputONTotal (Integration value of the number of relay ON times).</td>
</tr>
<tr>
<td></td>
<td>• The operation of this FB is one-shot, triggered by i_bEN (Execution command).</td>
</tr>
<tr>
<td></td>
<td>• If the FB has completed successfully, o_bOK (Normal completion) turns on.</td>
</tr>
<tr>
<td></td>
<td>• If the setting value of i_uRaNo (Target relay device number) is out of the setting range, o_bErr (Error completion) turns on and the processing of this FB is interrupted. In addition, the error code is stored in o_uErrId (Error code). For the error code, refer to the list of error codes.</td>
</tr>
<tr>
<td>FB compilation method</td>
<td>Macro type</td>
</tr>
<tr>
<td>FB operation</td>
<td>Pulsed execution (single scan execution type)</td>
</tr>
</tbody>
</table>
### Timing chart of I/O signals

When the operation is completed successfully:

- **i_bEN**: OFF
- **o_bENO**: OFF
- **o_bOK**: OFF
- **o_bErr**: OFF
- **o_uErrId**: 0

**Read processing of an integration value of the number of relay ON times**

1. **(1)**: Unexecuted
2. **(2)**: Read
   - Executed by the FB.

When the operation is completed with an error:

- **i_bEN**: OFF
- **o_bENO**: OFF
- **o_bOK**: OFF
- **o_bErr**: OFF
- **o_uErrId**: 0

**Read processing of an integration value of the number of relay ON times**

1. **(1)**: Unexecuted
2. **(2)**: Error code
   - Executed by the FB.

### Restrictions or precautions

- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because `i_bEN` (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off `i_bEN` (Execution command).
- When this FB is used twice or more, precaution must be taken to avoid duplication of the relay device number.
- The FB requires the configuration of the ladder for every input label.

### Error code

<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>101H</td>
<td>The set value of <code>i_uRaNo</code> is out of the range. The relay device number is not within the range of 0H to FH.</td>
<td>Execute the FB again after checking the setting.</td>
</tr>
</tbody>
</table>
2.2 M+model_CompareRelayOnTimes

Name

■RY10R2
M+RY10R2_CompareRelayOnTimes

■RY10R2-TS
M+RY10R2_TS_CompareRelayOnTimes

■RY18R2A
M+RY18R2A_CompareRelayOnTimes

Overview

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional overview</td>
<td>Reads the number of the relay ON times of the specified module and relay device number, compares the value with the set value, and outputs the comparison result.</td>
</tr>
</tbody>
</table>

Symbol

<table>
<thead>
<tr>
<th>Symbol</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi_bEN</td>
<td>(1)</td>
<td>Execution command On or off On: The FB is activated. Off: The FB is not activated.</td>
</tr>
<tr>
<td>DUT:i_tModule</td>
<td>(2)</td>
<td>Structure The setting range differs depending on the module label. Specify the module label of the contact output module.</td>
</tr>
<tr>
<td>Uwi_uRaNo</td>
<td>(3)</td>
<td>Target relay device number Word [Unsigned] 0H to FH Specify the relay device number to read the number of ON times. (For example, when output Y*0 is read, specify 0H.)</td>
</tr>
<tr>
<td>UD:i_udCompareCount</td>
<td>(4)</td>
<td>Number of comparisons Double Word [Unsigned] 0 to 4294967295 Specify the number of times for comparing with the relay ON times.</td>
</tr>
</tbody>
</table>

Labels

Input labels

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable name</th>
<th>Name</th>
<th>Data type</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>i_bEN</td>
<td>Execution command</td>
<td>Bit</td>
<td>On or off</td>
<td>On: The FB is activated. Off: The FB is not activated.</td>
</tr>
<tr>
<td>(2)</td>
<td>i_tModule</td>
<td>Module label</td>
<td>Structure</td>
<td>The setting range differs depending on the module label. Specify the module label of the contact output module.</td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>i_uRaNo</td>
<td>Target relay device</td>
<td>Word [Unsigned]</td>
<td>0H to FH</td>
<td>Specify the relay device number to read the number of ON times. (For example, when output Y*0 is read, specify 0H.)</td>
</tr>
<tr>
<td>(4)</td>
<td>i_udCompareCount</td>
<td>Number of comparisons</td>
<td>Double Word [Unsigned]</td>
<td>0 to 4294967295</td>
<td>Specify the number of times for comparing with the relay ON times.</td>
</tr>
</tbody>
</table>

*1 For the number of comparisons, refer to "Precautions when using the contact output module" in the following manual and specify a contact switching life suitable for the use environment including a switching current.

MELSEC iQ-R I/O Module User's Manual
### Output labels

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable name</th>
<th>Name</th>
<th>Data type</th>
<th>Default value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5)</td>
<td>o_bENO</td>
<td>Execution status</td>
<td>Bit</td>
<td>Off</td>
<td>On: The execution command is on. Off: The execution command is off.</td>
</tr>
<tr>
<td>(6)</td>
<td>o_udOutputOnTotal</td>
<td>Integration value of No. of relay ON times</td>
<td>Double Word [Unsigned]</td>
<td>0</td>
<td>The integration value of the number of relay ON times of the specified target module and relay device number is read.</td>
</tr>
<tr>
<td>(7)</td>
<td>o_bOK</td>
<td>Normal completion</td>
<td>Bit [Unsigned]</td>
<td>Off</td>
<td>When this label is on, it indicates that reading the number of relay ON times has been completed successfully.</td>
</tr>
<tr>
<td>(8)</td>
<td>o_bErr</td>
<td>Error completion</td>
<td>Bit</td>
<td>Off</td>
<td>When this label is on, it indicates that an error has occurred in the FB.</td>
</tr>
<tr>
<td>(9)</td>
<td>o_uErrId</td>
<td>Error code</td>
<td>Word [Unsigned]</td>
<td>0</td>
<td>The error code of an error that occurred in the FB is stored.</td>
</tr>
<tr>
<td>(10)</td>
<td>o_bFbResult</td>
<td>Comparison operation result</td>
<td>Bit</td>
<td>Off</td>
<td>This label turns on when the number of relay ON times is greater than the number of comparisons.</td>
</tr>
</tbody>
</table>

*1 o_udOutputOnTotal (Number of relay ON times) is the ring counter. Note that if an integration value exceeds 4294967295, the integration value returns to 0, and o_bFbResult (Comparison operation result) turns off from on.

### FB details

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available devices</td>
<td>Target module RY10R2, RY18R2A</td>
</tr>
<tr>
<td>CPU modules</td>
<td>MELSEC iQ-R series CPU modules</td>
</tr>
<tr>
<td>Engineering tool</td>
<td>GX Works3</td>
</tr>
<tr>
<td>Language</td>
<td>Ladder diagram</td>
</tr>
<tr>
<td>Number of basic steps</td>
<td>60 steps</td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Processing</td>
<td>• The integration value of the number of relay ON times specified with i_uRaNo (Target relay device number) of the module specified with i_stModule (Module label) is output to o_udOutputOnTotal (Integration value of the number of relay ON times).</td>
</tr>
<tr>
<td></td>
<td>• By turning on i_bEN (Execution command), the integration value of the number of relay ON times and the numbers specified with i_udCompareCount are compared. When o_udOutputOnTotal is greater than i_udCompareCount, o_bFbResult is turned on.</td>
</tr>
<tr>
<td></td>
<td>• The operation of this FB is one-shot, triggered by i_bEN (Execution command).</td>
</tr>
<tr>
<td></td>
<td>• If the FB has completed successfully, o_bOK (Normal completion) turns on.</td>
</tr>
<tr>
<td></td>
<td>• If the setting value of i_uRaNo (Target relay device number) is out of the setting range, o_bErr (Error completion) turns on and the processing of this FB is interrupted. In addition, the error code is stored in o_uErrId (Error code). For the error code, refer to the list of error codes.</td>
</tr>
<tr>
<td>FB compilation method</td>
<td>Macro type</td>
</tr>
<tr>
<td>FB operation</td>
<td>Pulsed execution (single scan execution type)</td>
</tr>
</tbody>
</table>
Timing chart of I/O signals

When the operation is completed successfully

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i_bEN</td>
<td>OFF</td>
</tr>
<tr>
<td>o_bENO</td>
<td>OFF</td>
</tr>
<tr>
<td>o_bOK</td>
<td>OFF</td>
</tr>
<tr>
<td>o_bErr</td>
<td>OFF</td>
</tr>
<tr>
<td>o_uErrId</td>
<td>OFF</td>
</tr>
</tbody>
</table>

Read processing of an integration value of the number of relay ON times
Integration value of relay ON comparison processing

When the operation is completed with an error

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i_bEN</td>
<td>OFF</td>
</tr>
<tr>
<td>o_bENO</td>
<td>OFF</td>
</tr>
<tr>
<td>o_bOK</td>
<td>OFF</td>
</tr>
<tr>
<td>o_bErr</td>
<td>OFF</td>
</tr>
<tr>
<td>o_uErrId</td>
<td>OFF</td>
</tr>
</tbody>
</table>

(1): Unexecuted
(2): Read
(3): Comparison operation
: Executed by the FB.

Restrictions or precautions
- This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- When this FB is used twice or more, precaution must be taken to avoid duplication of the relay device number.
- The FB requires the configuration of the ladder for every input label.
## Error code

<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>101H</td>
<td>The set value of i_uRaNo is out of the range. The relay device number is not within the range of 0H to FH.</td>
<td>Execute the FB again after checking the setting.</td>
</tr>
</tbody>
</table>
2.3 M+RX40NC6B_SaveEventTime

Name
M+RX40NC6B_SaveEventTime

Overview
Collects event time stamp data and stores the data in CSV files.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>

Symbol

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>i_bEN</td>
</tr>
<tr>
<td>(2)</td>
<td>DUT:i_stModule</td>
</tr>
<tr>
<td>(3)</td>
<td>UW:i_uEventTimeStampFunctionEnable_Disable</td>
</tr>
<tr>
<td>(4)</td>
<td>UW:i_u16ConditionEventTimeStampSetting</td>
</tr>
<tr>
<td>(5)</td>
<td>UW:i_bRefreshDataSetting</td>
</tr>
<tr>
<td>(6)</td>
<td>B:i_bStartSaveEventTime</td>
</tr>
<tr>
<td>(7)</td>
<td>UD:i_udStartingAddressSaveEventTimeData</td>
</tr>
<tr>
<td>(8)</td>
<td>B:i_bMakeCSV</td>
</tr>
<tr>
<td>(9)</td>
<td>UW:i_uMaxFileCount</td>
</tr>
<tr>
<td>(10)</td>
<td>B:i_bOverWrite</td>
</tr>
<tr>
<td>(11)</td>
<td>B:i_bResetStartingPosition</td>
</tr>
</tbody>
</table>

Labels

Input labels

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable name</th>
<th>Name</th>
<th>Data type</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>i_bEN</td>
<td>Execution command</td>
<td>Bit</td>
<td>On or off</td>
<td>On: The FB is activated. Off: The FB is not activated.</td>
</tr>
<tr>
<td>(2)</td>
<td>i_stModule</td>
<td>Module label</td>
<td>Structure</td>
<td></td>
<td>The setting range differs depending on the module label. Specify the module label of the input module with diagnostic functions.</td>
</tr>
<tr>
<td>(3)</td>
<td>i_uEventTimeStampFunctionEnable_Disable</td>
<td>Event time stamp function enable/disable</td>
<td>Word [Unsigned]</td>
<td>0001H to FFFFH</td>
<td>For X00 to X0F, set whether to enable or disable the event time stamp function. 0: Disable, 1: Enable</td>
</tr>
<tr>
<td>(4)</td>
<td>i_u16ConditionEventTimeStampSetting</td>
<td>Event time stamp condition setting</td>
<td>Word [Unsigned]</td>
<td>0 to 2</td>
<td>0: Rise 1: Fall 2: Rise + Fall</td>
</tr>
<tr>
<td>(5)</td>
<td>i_bRefreshDataSetting</td>
<td>Setting for not-refreshed data</td>
<td>Bit</td>
<td>On or off</td>
<td>On: When 128 or more event time stamp data sets exist, the old data is overwritten with newly generated data. Off: When 128 or more event time stamp data sets exist, the old data is not overwritten with newly generated data.</td>
</tr>
<tr>
<td>(6)</td>
<td>i_bStartSaveEventTime</td>
<td>Event time stamp start/stop</td>
<td>Bit</td>
<td>On or off</td>
<td>On: Collecting event time stamps is started. Off: Collecting event time stamps is stopped.</td>
</tr>
</tbody>
</table>
### Output labels

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable name</th>
<th>Name</th>
<th>Data type</th>
<th>Default value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(7)</td>
<td>i_udStartingAddressSaveEventTimeData</td>
<td>Start address of event time stamp data storage device</td>
<td>Double Word [Unsigned]</td>
<td>Valid device range</td>
<td>Specify a start address of the device (ZR) where event time stamp data is stored.</td>
</tr>
<tr>
<td>(8)</td>
<td>i_bMakeCSV</td>
<td>CSV file creation enable/disable</td>
<td>Bit</td>
<td>On or off</td>
<td>On: Event time stamp data is stored in CSV files. Off: Event time stamp data is not stored in CSV files.</td>
</tr>
<tr>
<td>(9)</td>
<td>i_uMaxFileCount</td>
<td>Maximum number of CSV files</td>
<td>Word [Unsigned]</td>
<td>1 to 100</td>
<td>Specify a maximum number of CSV files that this FB saves.</td>
</tr>
<tr>
<td>(10)</td>
<td>i_bOverWrite</td>
<td>CSV file overwrite command</td>
<td>Bit</td>
<td>On or off</td>
<td>Specify whether or not to overwrite the CSV files having smaller consecutive numbers when the number of CSV files that this FB has saved reaches the maximum number of CSV files. (When this label is off, storing data in the file register and outputting data to the CSV file are stopped.)</td>
</tr>
<tr>
<td>(11)</td>
<td>i_bResetStartingPosition</td>
<td>Start position clear of CSV file save</td>
<td>Bit</td>
<td>On or off</td>
<td>On: Data is stored from the beginning of the CSV file. Off: Data is stored following the previously stored data. (If previous data does not exist, data is stored from the beginning of the CSV file.)</td>
</tr>
<tr>
<td>(12)</td>
<td>o_bENO</td>
<td>Execution status</td>
<td>Bit</td>
<td>Off</td>
<td>On: The execution command is on. Off: The execution command is off.</td>
</tr>
<tr>
<td>(13)</td>
<td>o_bOK</td>
<td>Normal completion</td>
<td>Bit</td>
<td>Off</td>
<td>When this label is on, it indicates that the execution of this FB has been completed. If a module error has occurred at the execution start, this label does not turn on.</td>
</tr>
<tr>
<td>(14)</td>
<td>o_bOutputStatus</td>
<td>Event time stamp data save in progress</td>
<td>Bit</td>
<td>Off</td>
<td>When this label is on, it indicates that a CSV file is being created.</td>
</tr>
<tr>
<td>(15)</td>
<td>o_bExceedNumber</td>
<td>Maximum number reach flag of event time stamp data</td>
<td>Bit</td>
<td>Off</td>
<td>When this label is on, it indicates that the number of CSV files that this FB has saved has reached the maximum number of CSV files.</td>
</tr>
<tr>
<td>(16)</td>
<td>o_bErr</td>
<td>Error completion</td>
<td>Bit</td>
<td>Off</td>
<td>When this label is on, it indicates that an error has occurred in the FB.</td>
</tr>
<tr>
<td>(17)</td>
<td>o_uErrId</td>
<td>Error code</td>
<td>Word [Unsigned]</td>
<td>0</td>
<td>The error code of an error that occurred in the FB is stored.</td>
</tr>
</tbody>
</table>
FB details

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available devices</td>
<td>Target module: RX40NC6B</td>
</tr>
<tr>
<td></td>
<td>CPU modules: MELSEC iQ-R series CPU modules</td>
</tr>
<tr>
<td></td>
<td>Engineering tool: GX Works3</td>
</tr>
<tr>
<td>Language</td>
<td>Ladder diagram</td>
</tr>
<tr>
<td>Number of basic steps</td>
<td>1738 steps</td>
</tr>
</tbody>
</table>

Processing

- This FB starts/stops collecting event time stamps according to the on or off state of i_bStartSaveEventTime (Event time stamp start/stop) after i_bEN (Execution command) is turned on. This FB stores the data, which is stored in the event time stamp data for refresh in the CPU module, in the file register and CSV files.
- This FB stores the same data as the event time stamp data of the input module with diagnostic functions in the file register of the CPU module.
- If the number of data sets reaches the maximum number per CSV file (90000), this FB closes the CSV file where data is being saved and opens the next CSV file to continue to save data.
- If the set values of the event time stamp condition setting, start address of event time stamp data storage device, and maximum number of CSV files are out of the setting range, o_bErr (Error completion) turns on and the processing of the FB is interrupted. In addition, the error code is stored in o_uErrId (Error code). For the error code, refer to the list of error codes. (Page 18 Error code)
- If i_bOverWrite (CSV file overwrite command) is on and the number of files that this FB has saved in an SD memory card exceeds i_uMaxFileCount (Maximum number of CSV files), the consecutive number returns back to 1 and the save processing of event time stamp data continues.
- If i_bOverWrite (CSV file overwrite command) is off and the number of files that this FB has saved in an SD memory card reaches i_uMaxFileCount (Maximum number of CSV files), the processing to store event time stamp data in the file register and CSV files stops. If the number of data sets exceeds 90000, the 90001th data set and later are not stored.
- If the number of files that this FB has saved in an SD memory card reaches i_uMaxFileCount (Maximum number of CSV files), o_bExceedNumber (Maximum number reach flag of event time stamp data) turns on regardless of the on or off state of i_bOverWrite (CSV file overwrite command).
- A CPU error occurs in the following cases: when this FB has been executed with no SD memory card inserted into the CPU module; when the inserted SD memory card has no sufficient free space; or when the number of files stored exceeds the limit. In the event of an error, if the CPU module is in a stop error state, o_bErr (Error completion) and o_uErrId (Error code) are not updated. In the event of an error, if the CPU module is in a continuation error state, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code). For the error code, refer to the list of error codes. (Page 18 Error code)
- When i_bMakeCSV (CSV file creation enable/disable) is off, the set values of i_uMaxFileCount (Maximum number of CSV files) and i_bOverWrite (CSV file overwrite command) are disabled.
- The set values at FB operation start are valid for i_uEventTimeStampFunctionEnable_Disable (Event time stamp function enable/disable), i_u16ConditionEventTimeStampSetting (Event time stamp condition setting), i_bRefreshDataSetting (Setting for not-refreshed data), and i_bMakeCSV (CSV file creation enable/disable). Even if the values are changed during the execution of this FB, the changed values are invalid.
- Set the module label as the refresh target in the refresh setting of the module parameter. For the setting method, refer to the MELSEC iQ-R/ iO Module (With Diagnostic Functions) User's Manual (Application).
- For the format of CSV files that this FB creates, refer to CSV File Output Format of the FB for Event Time Stamp Data Collection/Save Function. (Page 19 CSV File Output Format of the FB for Event Time Stamp Data Collection/Save Function)
- When this FB saves data in an SD memory card, the CSV file name is given as follows: "RX" + "Middle two digits of the four digits representing the start I/O number" + "Consecutive number" + "." + "CSV". The maximum number of consecutive number varies with i_uMaxFileCount (Maximum number of CSV files). Turning off i_bEN (Execution command) results in the consecutive number being reset, and thereafter a consecutive number is given from 1 again. Suppose that the start I/O number of the input module with diagnostic functions is h0450, i_uMaxFileCount (Maximum number of CSV files) is 30, and the number of file creation by this FB is 8th. The file name is "RX45006.CSV".
- Turning on or off i_bResetStartingPosition (Start position clear of CSV file save) selects a data storage position.
- When i_uEventTimeStampFunctionEnable_Disable (Event time stamp function enable/disable) of this FB is set to 0000H and i_bEN (Execution command) is turned on, the error code is stored in o_uErrId (Error code). For the error code, refer to the list of error codes. (Page 18 Error code)
- When disabling all the bits of the event time stamp function enable/disable of the input module with diagnostic functions, turn off i_bStartSaveEventTime (Event time stamp start/stop). When ending the execution of this FB with all the bits of the event time stamp function enable/disable of the input module with diagnostic functions disabled, turn off i_bStartSaveEventTime (Event time stamp start/stop) and i_bEN (Execution command).

FB compilation method

- Macro type

FB operation

- Arbitrary execution type
### Timing chart of I/O signals

When the operation is completed successfully

- Data is output to CSV files.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i_bEN</td>
<td></td>
</tr>
<tr>
<td>o_bENO</td>
<td></td>
</tr>
<tr>
<td>i_bStartSaveEventTime</td>
<td></td>
</tr>
<tr>
<td>i_bMakeCSV</td>
<td></td>
</tr>
<tr>
<td>o_bOverWrite</td>
<td></td>
</tr>
<tr>
<td>o_bExceedNumber</td>
<td></td>
</tr>
<tr>
<td>Event occurrence</td>
<td></td>
</tr>
<tr>
<td>Storage of data to the file register</td>
<td></td>
</tr>
<tr>
<td>Storage of data to CSV files</td>
<td></td>
</tr>
<tr>
<td>o_bOutputStatus</td>
<td></td>
</tr>
<tr>
<td>o_bOK</td>
<td></td>
</tr>
<tr>
<td>o_bErr</td>
<td></td>
</tr>
<tr>
<td>o_uErrId</td>
<td></td>
</tr>
</tbody>
</table>

(1): Setting
(2): Storing
(3): Saving

: Executed by the FB.
: Executed by the module.
### Timing chart of I/O signals

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Data is not output to CSV files.</td>
</tr>
</tbody>
</table>

- **i_bEN**
- **o_bENO**
- **i_bStartSaveEventTime**
- **i_bMakeCSV**

- **'Event time stamp function enable/disable' (Uni/G1248)**
- **'Event time stamp condition setting X00 to X0F' (Uni/G1252 to Uni/G1267)**
- **'Setting for not-refreshed data' (Uni/G1280)**

- **Operating condition setting request (Y signal)**
- **Operating condition setting completed flag (X signal)**
- **i_bOverWrite**
- **o_bExceedNumber**

- **Event occurrence**
- **Storage of data to the file register**
- **Storage of data to CSV files**
- **o_bOutputStatus**
- **o_bOK**
- **o_bErr**
- **o_uErrId**

- **(1): Setting**
- **(2): Storing**
- **(3): Not saved**

- : Executed by the FB.
- : Executed by the module.
Timing chart of I/O signals

When the operation is completed with an error

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i_bEN</td>
<td>(1): Setting</td>
</tr>
<tr>
<td>o_bENO</td>
<td>(2): Storing</td>
</tr>
<tr>
<td>i_bStopSOE</td>
<td>(3): Saving</td>
</tr>
<tr>
<td>i_bMakeCSV</td>
<td>(4): Error code</td>
</tr>
<tr>
<td>Operating condition setting request (Y signal)</td>
<td>Executed by the FB.</td>
</tr>
<tr>
<td>Operating condition setting completed flag (X signal)</td>
<td>Executed by the module.</td>
</tr>
<tr>
<td>'Event time stamp function enable/disable' (Uni/G1248)</td>
<td></td>
</tr>
<tr>
<td>'Event time stamp condition setting X00 to X0F' (Uni/G1252 to Uni/G1267)</td>
<td></td>
</tr>
<tr>
<td>'Setting for not-refreshed data' (Uni/G1280)</td>
<td></td>
</tr>
<tr>
<td>i_bOverWrite</td>
<td></td>
</tr>
<tr>
<td>o_bExceedNumber</td>
<td></td>
</tr>
<tr>
<td>Event occurrence</td>
<td></td>
</tr>
<tr>
<td>Storage of data to the file register</td>
<td></td>
</tr>
<tr>
<td>Storage of data to CSV files</td>
<td></td>
</tr>
<tr>
<td>o_bOutputStatus</td>
<td></td>
</tr>
<tr>
<td>o_bOK</td>
<td></td>
</tr>
<tr>
<td>o_bErr</td>
<td></td>
</tr>
<tr>
<td>o_uErrId</td>
<td></td>
</tr>
</tbody>
</table>

(1): Setting
(2): Storing
(3): Saving
(4): Error code

: Executed by the FB.
: Executed by the module.
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.
- When a module error has occurred during the execution of this FB, refer to the MELSEC iQ-R I/O Module (With Diagnostic Functions) User’s Manual (Application) to check the error description and take corrective action, and then execute the FB again.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) cannot be turned off and the normal operation cannot be acquired. Always use this FB in programs that can turn off i_bEN (Execution command).
- This FB makes use of the SP.FWRITE instruction, and thus if an error occurs in the execution of the SP.FWRITE instruction, a CPU error occurs.
- If SM606 (SD memory card forced disable instruction) is on at the time of saving event time stamp data, the SP.FWRITE instruction is not processed, resulting in the event time stamp data not being saved. In this case, o_bErr (Error completion) turns on and the error code is stored in o_uErrId (Error code).
- The FB requires the configuration of the ladder for every input label.
- If no applicable device area exists at the address set in i_udStartingAddressSaveEventTimeData (Start address of event time stamp data storage device), a CPU error occurs. Set an applicable storage device area.
- The areas of 768 words starting from the address set in i_udStartingAddressSaveEventTimeData (Start address of event time stamp data storage device) are the output areas of this FB. Do not use these areas in other programs.
- This FB uses the file register as the event time stamp data storage device. Configure a proper file setting in the CPU parameter setting of GX Works3.
- Set i_uMaxFileCount (Maximum number of CSV files) with consideration for the capacity of the SD memory card and the number of files stored. If the capacity of the SD memory card or the number of files stored is exceeded as a result of execution of this FB, a CPU error occurs. For the capacity of SD memory cards and the number of files stored, refer to the MELSEC iQ-R Module Configuration Manual. The CSV files saved in the SD memory card of this FB are overwritten when the module is powered off and on and the FB is executed. Save the CSV files before powering off and on the module and executing the FB.
- When storing the data following the previously stored data in the CSV file with this FB, do not change the value of i_uMaxFileCount (Maximum number of CSV files). If the value is changed, the data is stored from the beginning of the CSV file.
- Since this FB uses latch labels, when the latch label area capacity is insufficient for a program, a message is displayed on GX Works3 at program conversion. Set a proper latch label area capacity in the CPU parameter setting of GX Works3 according to the message.
- When storing the data following the previously stored data in the CSV file with this FB, do not delete the CSV files saved in the SD memory card. If the files are deleted, a header row is not written in the CSV file. In addition, the data cannot be stored for the maximum number (90000).
<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>100H</td>
<td>The set value is out of the range of i_u16ConditionEventTimeStampSetting</td>
<td>Execute the FB again after checking the setting.</td>
</tr>
<tr>
<td></td>
<td>(Event time stamp condition setting).</td>
<td></td>
</tr>
<tr>
<td>101H</td>
<td>The set value is out of the range of i_uMaxFileCount (Maximum number of CSV</td>
<td>Execute the FB again after checking the setting.</td>
</tr>
<tr>
<td></td>
<td>files).</td>
<td></td>
</tr>
<tr>
<td>102H</td>
<td>The set value is out of the range of i_uEventTimeStampFunctionEnable_Disable</td>
<td>Execute the FB again after checking the setting.</td>
</tr>
<tr>
<td></td>
<td>(Event time stamp function enable/disable).</td>
<td></td>
</tr>
<tr>
<td>201H</td>
<td>An access to the SD memory card has failed because SM606 (SD memory card</td>
<td>Turn off SM606 (SD memory card forced disable instruction) and check that SM607 (SD memory card</td>
</tr>
<tr>
<td></td>
<td>forced disable instruction) is turned on. While event time stamp data is</td>
<td>forced disable state flag) has turned off, then execute the FB again.</td>
</tr>
<tr>
<td></td>
<td>being saved, turning on SM606 (SD memory card forced disable instruction)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>results in the partially created CSV file being saved in the SD memory card.</td>
<td></td>
</tr>
<tr>
<td>202H</td>
<td>Execution of this FB has been attempted without inserting an SD memory card</td>
<td>Insert an SD memory card for saving the target CSV files into the CPU module, and then execute</td>
</tr>
<tr>
<td></td>
<td>into the CPU module.</td>
<td>the FB again.</td>
</tr>
<tr>
<td>203H</td>
<td>An access to the SD memory card has failed because SM600 (Memory card</td>
<td>Make the SD memory card enabled, and then execute the FB again.</td>
</tr>
<tr>
<td></td>
<td>enabled/disabled flag) is off (disabled).</td>
<td></td>
</tr>
<tr>
<td>204H</td>
<td>The SD memory card is frequently accessed from programs in addition to</td>
<td>Reduce the frequency of the access to the SD memory card.</td>
</tr>
<tr>
<td></td>
<td>this FB, and a timeout has occurred in the event time stamp data write</td>
<td></td>
</tr>
<tr>
<td></td>
<td>processing.</td>
<td></td>
</tr>
<tr>
<td>205H</td>
<td>Because SM601 (Memory card protect flag) is on (write inhibited), data</td>
<td>Turn off the protect switch on the SD memory card (enabling write), check that SM601 (Memory card</td>
</tr>
<tr>
<td></td>
<td>cannot be written to the SD memory card.</td>
<td>protect flag) has turned off, and execute the FB again.</td>
</tr>
<tr>
<td>Error codes other than the above</td>
<td>Error codes related to the SP.FWRITE instruction that is executed to write event</td>
<td>For details on the error code that has occurred, refer to the description of the SP.FWRITE instruction. (MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks))</td>
</tr>
<tr>
<td></td>
<td>time stamp data to an SD memory card.</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix 1  CSV File Output Format of the FB for Event Time Stamp Data Collection/Save Function

This section describes the format specifications of CSV files that M+RX40NC6B_SaveEventTime (Event time stamp data collection/save function) outputs.

### Header row

Data is written in the order shown in the following table. (The file size of the header row is fixed to 48 bytes.)

<table>
<thead>
<tr>
<th>Column No.</th>
<th>Item</th>
<th>Output content</th>
<th>Size</th>
</tr>
</thead>
</table>
| Column 1   | Start I/O number          | I/O:

<table>
<thead>
<tr>
<th>Column No.</th>
<th>Column name</th>
<th>Output content</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column 1</td>
<td>Date and time of event time stamp occurrence</td>
<td>Time information in the event time stamp data stored in the buffer memory of the input module with diagnostic functions</td>
<td>31 bytes</td>
</tr>
<tr>
<td>Column 2</td>
<td>Event type</td>
<td>Event type information in the event time stamp data stored in the buffer memory of the input module with diagnostic functions</td>
<td>1 byte</td>
</tr>
<tr>
<td>Column 3</td>
<td>I/O terminal</td>
<td>I/O terminal information in the event time stamp data stored in the buffer memory of the input module with diagnostic functions</td>
<td>3 bytes</td>
</tr>
<tr>
<td>Column 4</td>
<td>Event time stamp storage status</td>
<td>Event time stamp storage status information in the event time stamp data stored in the buffer memory of the input module with diagnostic functions</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

### Data row

Data is written in the order shown in the following table.
INSTRUCTION INDEX

M

M+model_CompareRelayOnTimes .................. 7
M+model_ReadOutputOnTimes .................... 4
M+RX40NC6B_SaveEventTime .................... 11
**REVISIONS**

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

<table>
<thead>
<tr>
<th>Revision date</th>
<th>*Manual number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2014</td>
<td>BCN-P5999-0376-A</td>
<td>First edition</td>
</tr>
<tr>
<td>May 2016</td>
<td>BCN-P5999-0376-B</td>
<td>Added or modified parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapter 1, 2, Appendix</td>
</tr>
<tr>
<td>March 2017</td>
<td>BCN-P5999-0376-C</td>
<td>Added or modified parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapter 1, 2</td>
</tr>
<tr>
<td>April 2018</td>
<td>BCN-P5999-0376-D</td>
<td>Added or modified parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 2.1, 2.2, 2.3</td>
</tr>
</tbody>
</table>

Japanese manual number: BCN-P5999-0366-D

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