

PROGRAMMABLE CONTROLLERS

MELSEC iQ-F
series

MR-JE- A/MR-J4- A- RJ Servo Amplifier
Modbus-RTU Protocol FB Reference
(MELSEC iQ-F FX5 CPU Module)

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REVISIONS

specification No.	Revision date	Description
BCN-B62005-723-A_en-US	August, 2015	First edition

1. OVERVIEW

1.1. Overview of the FB Library

This FB library is for a system where MELSEC iQ-F CPU module FX5U and the MR-JEA or MR-J4A are connected via the Modbus-RTU communication.

1.2. Functions of the FB Library

Item	Description
M_FX5UCPU_MBSV_SetPointTableData	Sets positioning point table data.
M_FX5UCPU_MBSV_SetSVParamData	Sets servo parameter data.
M_FX5UCPU_MBSV_StartHPR	Starts a home position return operation.
M_FX5UCPU_MBSV_StartFastHPR	Starts a fast home position return operation.
M_FX5UCPU_MBSV_StartPointTable	Starts a positioning operation (point table).
M_FX5UCPU_MBSV_StartProgram	Starts a positioning operation (program).
M_FX5UCPU_MBSV_SetMultiPositioning	Sets the simultaneous start of positioning operation on multiple axes.
M_FX5UCPU_MBSV_ResetALMHistory	Clears the servo alarm history.
M_FX5UCPU_MBSV_SetMarkDetect	Sets the current position data latch at mark detection.
M_FX5UCPU_MBSV_ReadMarkDetect	Reads the current position data latched at mark detection.
M_FX5UCPU_MBSV_SetMarkDetectPositioning	Sets the interrupt positioning at mark detection.
M_FX5UCPU_MBSV_SetCam	Sets the cam number, cam stroke amount, and one-cycle length of the simple cam.
M_FX5UCPU_MBSV_Teaching	Stores the current position in the position data of a specified positioning point table number.
M_FX5UCPU_MBSV_ReadPointTableData	Reads the data of a specified point table number.
M_FX5UCPU_MBSV_ReadSVParamData	Reads servo parameter data.
M_FX5UCPU_MBSV_ReadALMHistory	Reads the alarm history.

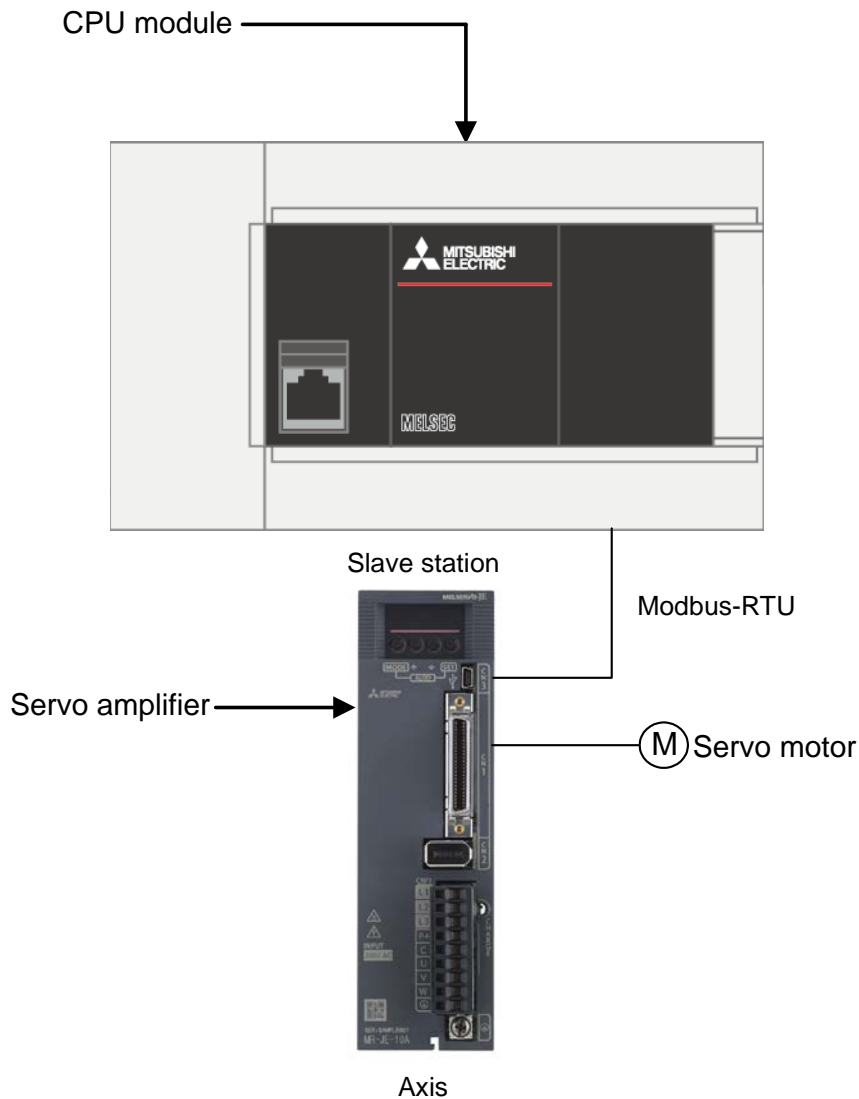
1.3. Applicable Hardware and Software, and Restrictions or Precautions

Item	Description						
Applicable hardware and software	CPU module	<table border="1"> <thead> <tr> <th data-bbox="689 344 1010 389">Series</th> <th data-bbox="1010 344 1509 389">Model</th> </tr> </thead> <tbody> <tr> <td data-bbox="689 389 1010 443">MELSEC iQ-F series</td> <td data-bbox="1010 389 1509 443">FX5U CPU, FX5UC CPU</td> </tr> </tbody> </table>	Series	Model	MELSEC iQ-F series	FX5U CPU, FX5UC CPU	
	Series	Model					
	MELSEC iQ-F series	FX5U CPU, FX5UC CPU					
	Special adapter for RS-485 communication (MODBUS-compatible)	<table border="1"> <thead> <tr> <th data-bbox="689 524 1010 568">Series</th> <th data-bbox="1010 524 1509 568">Model</th> </tr> </thead> <tbody> <tr> <td data-bbox="689 568 1010 622">Communication board</td> <td data-bbox="1010 568 1509 622">FX5-485-BD</td> </tr> <tr> <td data-bbox="689 622 1010 676">Communication adapter</td> <td data-bbox="1010 622 1509 676">FX5-485ADP</td> </tr> </tbody> </table>	Series	Model	Communication board	FX5-485-BD	Communication adapter
Series	Model						
Communication board	FX5-485-BD						
Communication adapter	FX5-485ADP						
Engineering tool	<table border="1"> <thead> <tr> <th data-bbox="689 786 1010 831">Series</th> <th data-bbox="1010 786 1509 831">Software version</th> </tr> </thead> <tbody> <tr> <td data-bbox="689 831 1010 884">GX Works3 *1</td> <td data-bbox="1010 831 1509 884">Version 1.007H or later</td> </tr> </tbody> </table> <p data-bbox="689 898 1509 974">*1 For the software versions applicable to the modules used, refer to the relevant manuals.</p>	Series	Software version	GX Works3 *1	Version 1.007H or later		
Series	Software version						
GX Works3 *1	Version 1.007H or later						
Slave module	<table border="1"> <thead> <tr> <th data-bbox="689 1032 1010 1077">Series</th> <th data-bbox="1010 1032 1509 1077">Model</th> </tr> </thead> <tbody> <tr> <td data-bbox="689 1077 1010 1131">MELSERVO JE series</td> <td data-bbox="1010 1077 1509 1131">MR-JE-A (Version B7 or later)</td> </tr> <tr> <td data-bbox="689 1131 1010 1227">MELSERVO J4 series</td> <td data-bbox="1010 1131 1509 1227">MR-J4-A-RJ (Version B7 or later)</td> </tr> </tbody> </table>	Series	Model	MELSERVO JE series	MR-JE-A (Version B7 or later)	MELSERVO J4 series	MR-J4-A-RJ (Version B7 or later)
Series	Model						
MELSERVO JE series	MR-JE-A (Version B7 or later)						
MELSERVO J4 series	MR-J4-A-RJ (Version B7 or later)						

Item	Description
Restrictions or precautions	<p>The following describes the restrictions and precautions common to all FBs. As the details specific to each FB have been described individually, refer to 2. DETAILS OF THE FB LIBRARY.</p> <ol style="list-style-type: none"> 1) FBs need to access Servo parameters, so set "00ABh" to Pr.PA19(Parameter block) before using FBs. Some of Servo parameters are effective after resetting. After changing these parameters, reset Servo amplifier before using FBs. 2) These FBs do not include error recovery processing. Program the error recovery processing in accordance with the required operations in the system used. 3) Servo alarms cannot be detected by FBs. M_FX5UCPU_MBSV_ReadALMHistory (Alarm history read processing) is needed to check servo alarms. Refer to Instruction manual of used servo amplifier to get alarm detail explanation. 4) When Modbus-RTU communication error is occurs, retry communication is used. When the communication retry count exceeds the set value of i_uRetryCount, error code 111h will occur. When the Modbus-RTU communication error occurs, there is a possibility that there is an error of station No. or abnormality in the ambient environment. Please check the stationNo. , cable or noise. 5) These FBs cannot be used in an interrupt program. 6) Do not use these FBs in programs that are only executed once, such as a subroutine program or FOR-NEXT loop, because i_bEN (Execution command) has to be turned off to realize correct operation. Always use these FBs in programs that can turn off i_bEN (Execution command). 7) When two or more of these FBs are used, precaution must be taken to avoid duplication of the target axis and the simultaneous start. 8) Every input must be provided with a value for proper FB operation. 9) These FBs reads the data of the disclosed labels and input labels when i_bEN (Execution command) is turned on. Thus, set the input labels and externally-disclosed labels before turning on i_bEN (Execution command). 10) After i_bEN (Execution command) has been turned on, do not change the values of the other input labels. Note that the values of the input labels of some FBs(always-executed) can be changed even after i_bEN (Execution command) has been turned on. For details, refer to 2. DETAILS OF THE FB LIBRARY. 11) When the FX5UCPU or FX5UCCPU is used as a Modbus master module, the controllable slave station numbers are 1 to 32. Set the servo amplifier station numbers within the range of 1 to 32. 12) The following FBs operate the control command (6040h). While these FBs are being executed, be careful not to operate the control command (6040h) of the same station outside the FBs. <ul style="list-style-type: none"> M_FX5UCPU_MBSV_StartHPR (Home position return start) M_FX5UCPU_MBSV_StartFastHPR (Fast home position return start) M_FX5UCPU_MBSV_StartPointTable (Positioning operation start (point table)) M_FX5UCPU_MBSV_StartProgram (Positioning operation start (program))

1.4. System Configuration Example

Configuration example of FX5UCPU



A slave device connected via Modbus is called a slave station. In a servo system, servo amplifiers and servo motors used are called "axis". In this document, a "station" represents a slave device (including a servo amplifier) in the explanations of the Modbus communication. An "axis" represents a servo amplifier in the explanations and names related to the operations or functions of a servo system.

1.5. Relevant Manuals

- MR-JE-_A SERVO AMPLIFIER INSTRUCTION MANUAL (SH-030128)
- MR-JE-_A SERVO AMPLIFIER INSTRUCTION MANUAL (POSITIONING MODE) (SH-030143)
- MR-JE-_A SERVO AMPLIFIER INSTRUCTION MANUAL (Modbus-RTU COMMUNICATION) (SH-030177)
- MELSERVO-JE Servo amplifier INSTRUCTION MANUAL (TROUBLE SHOOTING) (SH-030166)
- MR-J4-_A(-RJ)/MR-J4-_A4(-RJ)/MR-J4-_A1(-RJ) SERVO AMPLIFIER INSTRUCTION MANUAL (SH-030107)
- MR-J4-_A-RJ/MR-J4-_A4-RJ/MR-J4-_A1-RJ SERVO AMPLIFIER INSTRUCTION MANUAL (POSITIONING MODE) (SH-030143)
- MR-J4-_A_(-RJ) SERVO AMPLIFIER INSTRUCTION MANUAL (Modbus-RTU Protocol) (SH-030175)
- MELSERVO-J4 Servo amplifier INSTRUCTION MANUAL (TROUBLE SHOOTING) (SH-030109)

1.6. Note

This chapter includes information related to the function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

Please make sure to read user's manuals for the corresponding products before using the products.

Please use the FBs described in this manual taking note of the following items below.

- When diverting the FB to the actual system, be sure to verify that there are no problems with control in the system.
- Add interlock conditions in the target system where considered necessary.
- Mitsubishi Electric will not be liable for any damage or loss resulting from the use of these FBs.
- The contents written in this specification may be changed without a prior notice for improvement or other reasons in the future.

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2. DETAILS OF THE FB LIBRARY

2.1. M_FX5UCPU_MBSV_SetPointTableData (Point table data setting)

Name

M_FX5UCPU_MBSV_SetPointTableData

FB details

Item	Description																																		
Function overview	Sets positioning point table data.																																		
Symbol	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">M_FX5UCPU_MBSV_SetPointTableData</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td>Execution status</td> </tr> <tr> <td>Station No.</td> <td>UW: i_uStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Point table No.</td> <td>UW: i_uPointNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Write mode</td> <td>UW: i_uWriteMode</td> <td>o_uErrId :UW</td> <td>Error code</td> </tr> <tr> <td>Retry Count No.</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">pb_dPositAdr</td> <td>Position data</td> </tr> <tr> <td>pb_uCommandSpeed</td> <td>Speed data</td> </tr> <tr> <td>pb_uAccTime</td> <td>Acceleration time constant</td> </tr> <tr> <td>pb_uDecTime</td> <td>Deceleration time constant</td> </tr> <tr> <td>pb_uDwellTime</td> <td>Dwell</td> </tr> <tr> <td>pb_uSubFunction</td> <td>Sub function</td> </tr> <tr> <td>pb_uMCode</td> <td>M code</td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Point table No.	UW: i_uPointNo	o_bErr :B	Error completion	Write mode	UW: i_uWriteMode	o_uErrId :UW	Error code	Retry Count No.	UW: i_uRetryCount			pb_dPositAdr	Position data	pb_uCommandSpeed	Speed data	pb_uAccTime	Acceleration time constant	pb_uDecTime	Deceleration time constant	pb_uDwellTime	Dwell	pb_uSubFunction	Sub function	pb_uMCode	M code
Execution command	B: i_bEN	o_bENO :B	Execution status																																
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pb_uDecTime	Deceleration time constant																																		
pb_uDwellTime	Dwell																																		
pb_uSubFunction	Sub function																																		
pb_uMCode	M code																																		

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Point table No.	i_uPointNo	Word [unsigned]	For MR-JE-A: 1 to 31 For MR-J4-A: 1 to 255	Specify the point table number to set.
Write mode	i_bWriteMode	Bit	On or off	Set a write destination memory. Off: Writing data to RAM On: Writing data to RAM and EEPROM To retain data even after the servo amplifier has been powered off, set 1 and write the data to the EEPROM. Write all servo parameters written in RAM to EEPROM before executing FB.

Name (comment)	Label name	Data type	Setting range	Description
Retry Count No.	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr(error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrld(error code). 0 setting is same as 1.

●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that the point table data setting has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrld	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
Position data	pb_dPositAddr	Double word [signed]	-999999 to 999999 $\times 10^{\text{STM}}$ μm $\times 10^{(\text{STM}-4)}$ inch pulse -360000 to 360000 $\times 10^{-3}$ degree *1	When the positioning command method selection ("___x") of the command mode selection (PT01) is set to 0h (Absolute value command method): In the sub function, when using point tables under the absolute value command method, set the target address (absolute value). In the sub function, when using point tables under the incremental value command method, set the travel distance. A "-" sign indicates a reverse rotation command. When the positioning command method selection ("___x") of the command mode selection (PT01) is set to 1h (Incremental value command method): Set the travel distance.
Speed data	pb_uCommandSpeed	Word [unsigned]	0 to permissible speed r/min *2	Set the command speed of the servo motor at the execution of the positioning. If command speed is set larger than allowed motor speed, then command speed is clumped at allowed motor speed.

Name (comment)	Label name	Data type	Setting range	Description
Acceleration time constant	pb_uAccTime	Word [unsigned]	0 to 20000 msec	Set the time for the servo motor to reach rated speed.
Deceleration time constant	pb_uDecTime	Word [unsigned]	0 to 20000 msec	Set the time for the servo motor to stop from rated speed.
Dwell	pb_uDwellTime	Word [unsigned]	0 to 20000 msec	<p>Set the dwell time.</p> <p>To make the dwell time invalid, set "0" or "2" to the sub function.</p> <p>To perform continuous operation, set "1", "3", "8", or "9" to the sub function and "0" to the dwell time.</p> <p>When the dwell time has been set, the position command of the selected point table is completed. After the set dwell time has elapsed, the position command of the next point table is started.</p>

Name (comment)	Label name	Data type	Setting range	Description
Sub function	pb_uSubFunction	Word [unsigned]	0 to 3, 8 to 11	<p>Set the sub function.</p> <p>(1) When using this point table under the absolute value command method</p> <p>0: Automatic operation is performed in accordance with a single point table selected.</p> <p>1: Operations are continuously performed in accordance with consecutive points in point table without stopping.</p> <p>8: Automatic continuous operations are performed to the point table selected at the startup.</p> <p>9: Automatic continuous operations are performed to the point table No. 1.</p> <p>(2) When using this point table under the incremental value command method</p> <p>2: Automatic operation is performed in accordance with a single point table selected.</p> <p>3: Operations are continuously performed in accordance with consecutive points in point table without stopping.</p> <p>10: Automatic continuous operations are performed to the point table selected at the startup.</p> <p>11: Automatic continuous operations are performed to the point table No. 1.</p> <p>When a different rotation direction has been set, smoothing zero (command output) is checked and the rotation direction is reversed.</p> <p>When "1" or "3" is set for the point table No. 31, an error will occur.</p> <p>For details, refer to the instruction manual of the servo amplifier used.</p>
M code	pb_uMCode	Word [unsigned]	0 to 99	Set an M code.

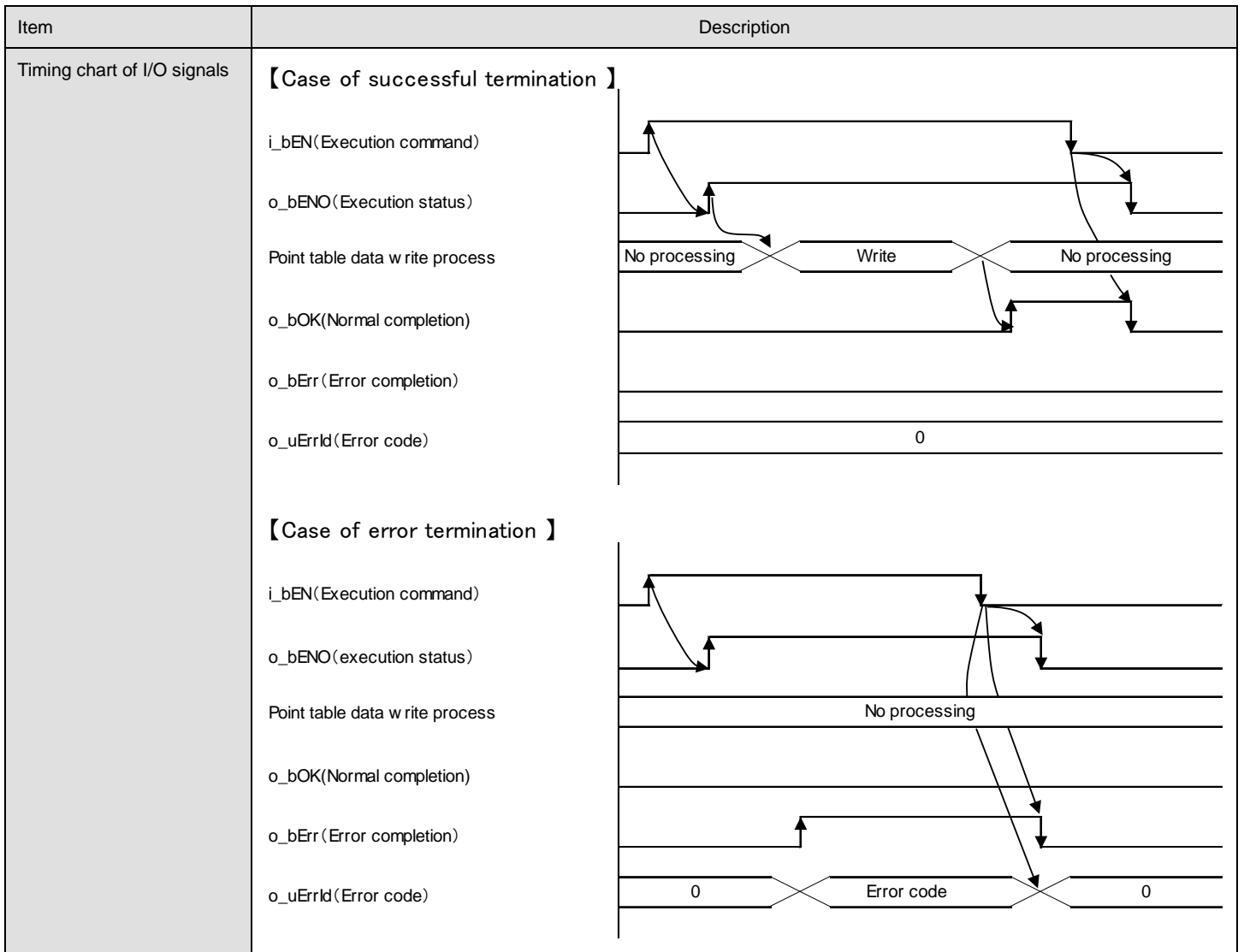
*1 STM(Feed length multiplication)

This function is available when point table mode or program mode.

This function is disabled when the position data unit of "degree" or "pulse".

*2 The unit will be "mm/s" for the linear control mode.

Item	Description
Language	Ladder diagram
Number of steps	446 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the set point table data is written to the servo amplifier. 2) To use an M code, set " _ _ x _ " of Function selection O-3 (Pr. PO12) to 1h using MR Configurator2 or M_FX5UCPU_MBSV_SetSVParamData (Servo parameter data setting) in advance. <u>To change this servo amplifier setting, configure the setting and power off and on the servo amplifier to apply the new values.</u> M code of MR-JE-A will be compatible soon. 3) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 4) If the setting value of the point table No. 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 103h is stored in o_uErrId (Error code). 5) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	<ol style="list-style-type: none"> 1) The number of times to write data to the EEP-ROM is limited to 100,000. If the number of times to write data to the EEP-ROM exceeds 100,000, the servo amplifier may malfunction when the EEP-ROM reaches the end of its useful life. 2) When you use this FB, set the controlword(6060h) to the point table mode(-101). If you run this FB in the program mode, the program data may get corrupted. 3) Since in servo amplifier it is not possible to write to the EEPROM during power-off state, please do not turn off the amplifier power when using this FB. Even if the processing is normally completed, if the power of the amplifier is turned off, the changes may not be saved. 4) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
103h	The set value of i_uPointNo (Point table No.) is out of the setting range.	Try again after checking the setting.
10Dh	Point table data is out of range	Try after checking the setting.
111h	Modbus communication rety count exceeded the number set in i_uRetryCount.	Try after checking the setting. Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.2. M_FX5UCPU_MBSV_SetSVParamData (Servo parameter data setting)

Name

M_FX5UCPU_MBSV_SetSVParamData

FB details

Item	Description																												
Function overview	Sets servo parameter data.																												
Symbol	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center; margin: 0;">M_FX5UCPU_MBSV_SetSVParamData</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 2px;">Execution Command</td> <td style="width: 30%; padding: 2px;">B: i_bEN</td> <td style="width: 30%; padding: 2px;">o_bENO :B</td> <td style="width: 10%; padding: 2px;">Execution status</td> </tr> <tr> <td style="padding: 2px;">Station No.</td> <td style="padding: 2px;">UW: i_uStationNo</td> <td style="padding: 2px;">o_bOK :B</td> <td style="padding: 2px;">Normal completion</td> </tr> <tr> <td style="padding: 2px;">Parameter group</td> <td style="padding: 2px;">UW: i_uSVPRM_Grp</td> <td style="padding: 2px;">o_bErr :B</td> <td style="padding: 2px;">Error completion</td> </tr> <tr> <td style="padding: 2px;">Parameter No.</td> <td style="padding: 2px;">UW: i_uSVPRM_No</td> <td style="padding: 2px;">o_uErrld :UW</td> <td style="padding: 2px;">Error code</td> </tr> <tr> <td style="padding: 2px;">Parameter data</td> <td style="padding: 2px;">D: i_dSVPRM_Data</td> <td></td> <td></td> </tr> <tr> <td style="padding: 2px;">Write mode</td> <td style="padding: 2px;">UW: i_uWriteMode</td> <td></td> <td></td> </tr> <tr> <td style="padding: 2px;">Retry count No.</td> <td style="padding: 2px;">UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> </div>	Execution Command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Parameter group	UW: i_uSVPRM_Grp	o_bErr :B	Error completion	Parameter No.	UW: i_uSVPRM_No	o_uErrld :UW	Error code	Parameter data	D: i_dSVPRM_Data			Write mode	UW: i_uWriteMode			Retry count No.	UW: i_uRetryCount		
Execution Command	B: i_bEN	o_bENO :B	Execution status																										
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion																										
Parameter group	UW: i_uSVPRM_Grp	o_bErr :B	Error completion																										
Parameter No.	UW: i_uSVPRM_No	o_uErrld :UW	Error code																										
Parameter data	D: i_dSVPRM_Data																												
Write mode	UW: i_uWriteMode																												
Retry count No.	UW: i_uRetryCount																												

Labels

● Input labels

Name (comment)	Label name	Data type	Setting range	Description																																												
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.																																												
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.																																												
Parameter group	i_uSVPRM_Grp	Word [unsigned]	H2000, H2080, H2100, H2180, H2200, H2280, H2300, H2380, H2400, H2480	Specify the parameter group to set data. <table border="1" style="margin: 10px auto; width: 80%;"> <thead> <tr> <th>Setting value</th> <th>Parameter group</th> <th>MR-JE-A</th> <th>MR-J4-A</th> </tr> </thead> <tbody> <tr><td>H 2000</td><td>PA group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2080</td><td>PB group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2100</td><td>PC group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2180</td><td>PD group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2200</td><td>PE group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2280</td><td>PF group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2300</td><td>PO group</td><td style="text-align: center;">×</td><td style="text-align: center;">○</td></tr> <tr><td>H 2380</td><td>PS group</td><td style="text-align: center;">×</td><td style="text-align: center;">○</td></tr> <tr><td>H 2400</td><td>PL group</td><td style="text-align: center;">×</td><td style="text-align: center;">○</td></tr> <tr><td>H 2480</td><td>PT group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> </tbody> </table>	Setting value	Parameter group	MR-JE-A	MR-J4-A	H 2000	PA group	○	○	H 2080	PB group	○	○	H 2100	PC group	○	○	H 2180	PD group	○	○	H 2200	PE group	○	○	H 2280	PF group	○	○	H 2300	PO group	×	○	H 2380	PS group	×	○	H 2400	PL group	×	○	H 2480	PT group	○	○
Setting value	Parameter group	MR-JE-A	MR-J4-A																																													
H 2000	PA group	○	○																																													
H 2080	PB group	○	○																																													
H 2100	PC group	○	○																																													
H 2180	PD group	○	○																																													
H 2200	PE group	○	○																																													
H 2280	PF group	○	○																																													
H 2300	PO group	×	○																																													
H 2380	PS group	×	○																																													
H 2400	PL group	×	○																																													
H 2480	PT group	○	○																																													
Parameter No.	i_uSVPRM_No	Word [unsigned]	1 to 80 (decimal)	Specify the servo parameter number.																																												

Name (comment)	Label name	Data type	Setting range	Description
Parameter data	i_dSVPRM_Data	Double word [signed]	Refer to the instruction manual of the servo amplifier used.	Set the servo parameter value to be changed.
Write mode	i_bWriteMode	Bit	On or off	Set a write destination memory. Off: Writing data to RAM On: Writing data to RAM and EEPROM Some parameters become valid by powering off and on the servo amplifier after writing the data to the EEPROM of the servo amplifier. For details, refer to the instruction manual of the servo amplifier used. Write all servo parameters written in RAM to EEPROM before executing FB.
Retry Count No.	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr(error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId(error code). 0 setting is same as 1.

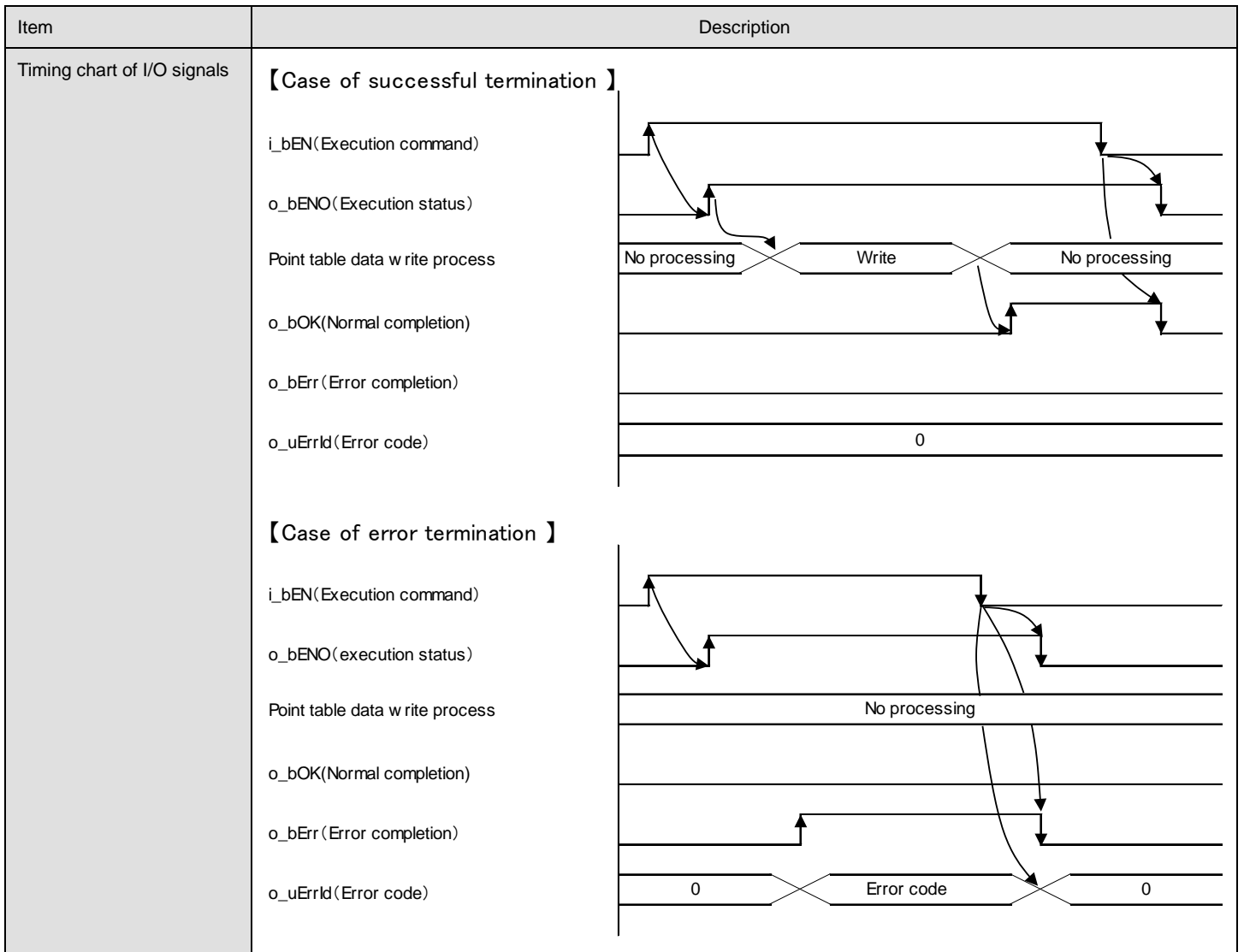
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that the servo parameter data setting has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	730 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the set servo parameter data is written to the servo amplifier. 2) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 3) If the setting value of the parameter group or parameter 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 101h is stored in o_uErrId (Error code). 4) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	<ol style="list-style-type: none"> 1) The number of times to write data to the EEP-ROM is limited to 100,000. If the number of times to write data to the EEP-ROM exceeds 100,000, the servo amplifier may malfunction when the EEP-ROM reaches the end of its useful life. 2) Some parameters requires servo amplifier to be turned off and on to be valid. If these parameters are changed, then turn power on after turning it off. 3) According to the setting of Pr. PA19 (Parameter writing inhibit), the range of parameters written by this FB is limited. Set Pr. PA19 as necessary. For the setting values, refer to the instruction manual of the servo amplifier used. 4) Since in servo amplifier it is not possible to write to the EEPROM during power-off state, please do not turn off the amplifier power when using this FB. Even if the processing is normally completed, if the power of the amplifier is turned off, the changes may not be saved. 5) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
101h	The set value of i_uSVPRM_Grp (Parameter group) or i_uSVPRM_No (Parameter No.) is out of the setting range.	Try again after checking the setting.
10Ah	Parameter other than 00ABh is set in PrPA19 .	Try again after checking the setting.
10Eh	i_dSVPRM_data(ParameterData) is out of the setting range.	Try again after checking the setting.
111h	Modbus communication retry count exceeded the number set in i_uRetryCount.	Try again after checking the setting. Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.3. M_FX5UCPU_MBSV_StartHPR (Home position return start)

Name

M_FX5UCPU_MBSV_StartHPR

FB details

Item	Description																
Function overview	Starts a home position return operation.																
Symbol	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"> <p style="text-align: center; margin: 0;">M_FX5UCPU_MBSV_StartHPR</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">Execution Command</td> <td style="width: 30%; padding: 5px;">B: i_bEN</td> <td style="width: 30%; padding: 5px;">o_bENO :B</td> <td style="padding: 5px;">Execution status</td> </tr> <tr> <td style="padding: 5px;">Station No.</td> <td style="padding: 5px;">UW: i_uStationNo</td> <td style="padding: 5px;">o_bOK :B</td> <td style="padding: 5px;">Normal completion</td> </tr> <tr> <td style="padding: 5px;">Retry count No.</td> <td style="padding: 5px;">UW: i_uRetryCount</td> <td style="padding: 5px;">o_bErr :B</td> <td style="padding: 5px;">Error completion</td> </tr> <tr> <td></td> <td></td> <td style="padding: 5px;">o_uErrld :UW</td> <td style="padding: 5px;">Error code</td> </tr> </table> </div>	Execution Command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Retry count No.	UW: i_uRetryCount	o_bErr :B	Error completion			o_uErrld :UW	Error code
Execution Command	B: i_bEN	o_bENO :B	Execution status														
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion														
Retry count No.	UW: i_uRetryCount	o_bErr :B	Error completion														
		o_uErrld :UW	Error code														

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON,OFF	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1~32	Specify the slave station number.
Retry count	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr(error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrld(error code). 0 setting is same as 1.

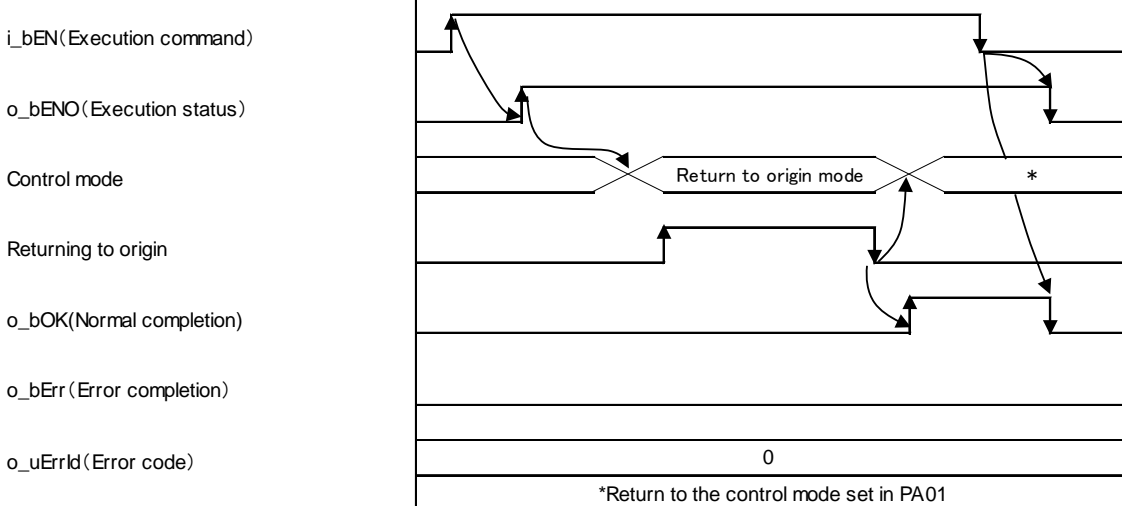
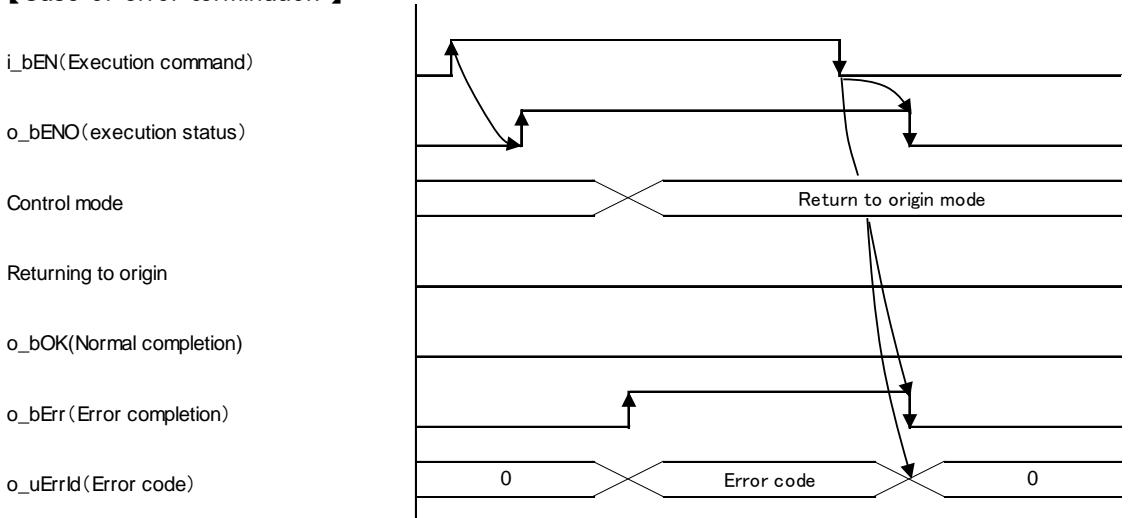
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that starting the home position return has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description																																							
Language	Ladder diagram																																							
Number of steps	503 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.																																							
FB dependency relation	No dependency relation																																							
Processing	<p>1) Homing of the indicated station is started according to i_bEN(Execution command) status.</p> <p>2) If the setting value of the station 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 100h is stored in o_uErrId (Error code).</p> <p>3) If instantaneous home positioning is executed while servo on or at starting state (setting other than 000F is set in control command (6040h)), FB processing is interrupted. Error code 106h is stored in o_uErrId (error code).</p> <p>4) If Pr.PA19 is not 00ABh, o_bErr(abnormal completion) turns on and FB process is interrupted. Error code 10Ah is stored in o_uErrId (error code).</p> <p>5) Refer to List of error codes to get the details of error codes</p> <p>6) Set 0Fh to control command object 6040(Servo-on), before using this FB.</p> <p>7) Set homing method (Pr.PT04) by MR Configurator2 or M_FX5UCPU_MBSV_SetSVParamData (servo parameter data setting) before using this FB. Pr.PT04 can be used after resetting.</p> <p>And, in some cases, there are parameters that needs additional setting, set parameters as in the table below.</p> <p>Parameter marked with (*) become valid after power resetting.</p> <table border="1" data-bbox="461 1016 1415 1727"> <thead> <tr> <th>Setting items</th> <th>Parameters</th> <th>Adress</th> </tr> </thead> <tbody> <tr> <td>HPR method</td> <td>PT04(*)</td> <td>6098h</td> </tr> <tr> <td>HPR direction</td> <td>PT04(*)</td> <td>6098h</td> </tr> <tr> <td>Dog input polarity</td> <td>PT29(*)</td> <td>-</td> </tr> <tr> <td>HPR speed</td> <td>PT05</td> <td>6099h(sub1)</td> </tr> <tr> <td>Creep speed</td> <td>PT06</td> <td>6099h(sub2)</td> </tr> <tr> <td>OP shift amount</td> <td>PT07</td> <td>-</td> </tr> <tr> <td>Acceleration time</td> <td>PC30</td> <td>2801(sub3)</td> </tr> <tr> <td>Deceleration time</td> <td>PC31</td> <td>2801(sub4)</td> </tr> <tr> <td>OP address</td> <td>PT08(*)</td> <td>-</td> </tr> <tr> <td>setting for the movemen amount after near-point dog ON</td> <td>PT09</td> <td>-</td> </tr> <tr> <td>Stopper time</td> <td>PT10</td> <td>-</td> </tr> <tr> <td>HPR torque limit value</td> <td>PT11</td> <td>-</td> </tr> </tbody> </table> <p>8) When the process is normally completed, the control mode changes according to Pr.PA01. In case of abnormal completion control mode might not switch to the setting in Pr.PA01..</p>	Setting items	Parameters	Adress	HPR method	PT04(*)	6098h	HPR direction	PT04(*)	6098h	Dog input polarity	PT29(*)	-	HPR speed	PT05	6099h(sub1)	Creep speed	PT06	6099h(sub2)	OP shift amount	PT07	-	Acceleration time	PC30	2801(sub3)	Deceleration time	PC31	2801(sub4)	OP address	PT08(*)	-	setting for the movemen amount after near-point dog ON	PT09	-	Stopper time	PT10	-	HPR torque limit value	PT11	-
Setting items	Parameters	Adress																																						
HPR method	PT04(*)	6098h																																						
HPR direction	PT04(*)	6098h																																						
Dog input polarity	PT29(*)	-																																						
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Creep speed	PT06	6099h(sub2)																																						
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Stopper time	PT10	-																																						
HPR torque limit value	PT11	-																																						
FB compilation method	Macro type																																							

Item	Description
Restrictions or precautions	1) This FB operates the control instruction object (6040h). Thus, while this FB is being executed, be careful not to operate the control instruction object (6040h) of the same station outside the FB. 2) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)
Timing chart of I/O signals	<p>【Case of successful termination】</p>  <p>The timing chart for successful termination shows the following sequence of events: <ul style="list-style-type: none"> i_bEN (Execution command): A pulse that starts the execution. o_bENO (Execution status): Transitions from low to high when execution begins and returns to low when it ends. Control mode: Transitions to a state labeled "Return to origin mode" during execution. Returning to origin: A pulse that occurs while the control mode is in "Return to origin mode". o_bOK (Normal completion): A pulse that occurs after the "Returning to origin" pulse. o_bErr (Error completion): Remains low throughout the process. o_uErrId (Error code): Shows a value of 0. A note at the bottom states: <i>*Return to the control mode set in PA01</i>. </p> <p>【Case of error termination】</p>  <p>The timing chart for error termination shows the following sequence of events: <ul style="list-style-type: none"> i_bEN (Execution command): A pulse that starts the execution. o_bENO (Execution status): Transitions from low to high when execution begins and returns to low when it ends. Control mode: Transitions to a state labeled "Return to origin mode" during execution. Returning to origin: A pulse that occurs while the control mode is in "Return to origin mode". o_bOK (Normal completion): Remains low throughout the process. o_bErr (Error completion): A pulse that occurs after the "Returning to origin" pulse. o_uErrId (Error code): Transitions from 0 to a value labeled "Error code" during the error period and returns to 0 after. </p>

Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
106h	FB is operated during servo-off or operating motor	Try again after checking servo on and motor is stopped.
10Ah	Pr.PA19 is not 00ABh.	Try again after checking the setting.
111h	Modbus communication Retry count exceeded the number set in i_uRetryCount.	Try after checking the setting. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.4. M_FX5UCPU_MBSV_StartFastHPR (Fast home position return start)

Name

M_FX5UCPU_MBSV_StartFastHPR

FB details

Item	Description
Function overview	Starts a fast home position return operation.
Symbol	<div style="text-align: center;"> </div>

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrld (error code). 0 setting is same as 1.

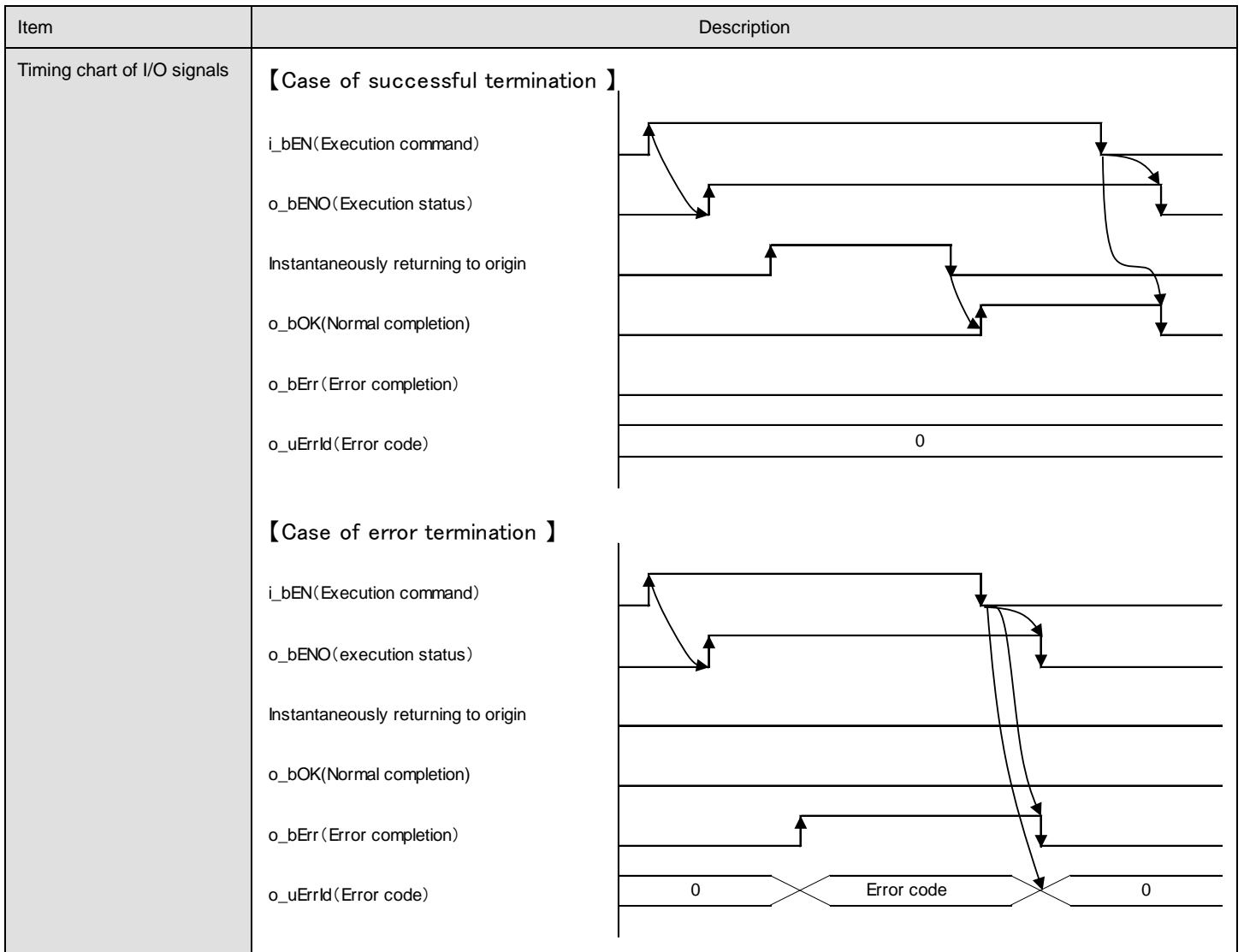
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that starting the fast home position return has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrld	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	417 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) Change control mode(6060h) to point table mode(-101) before trying FB. If the control mode is set other than point table mode, then o_bErr(error complete) is turned on and interrupt FB processing. Error code 10Fh is stored in o_uErrId(error code) 2) By turning on i_bEN (Execution command), the fast home position return of a specified station number is started. 3) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 4) If instantaneous home positioning is executed while servo on or at starting state (setting other than 000F is set in control command (6040h)), FB processing is interrupted. Error code 106h is stored in o_uErrId (error code). 5) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	<ol style="list-style-type: none"> 1) This FB operates the control instruction object (6040h). Thus, while this FB is being executed, be careful not to operate the control instruction object (6040h) of the same station outside the FB. 2) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
106h	FB is executed while servo off or at starting state(control command(6040h) is set other than 000Fh)	Retry after checking amplifier is servo on and stopped state.
10Fh	Control mode (6060h) is set other than point table mode(-101) setting.	Retry after point table mode(-101) is set in control mode(6060h)
111h	Modbus communication rety count exceeded the number set in i_uRetryCount (retry count)	Retry after checking the setting of FB Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.5. M_FX5UCPU_MBSV_StartPointTable (Positioning operation start (point table))

Name

M_FX5UCPU_MBSV_StartPointTable

FB details

Item	Description																								
Function overview	Starts a positioning operation (point table).																								
Symbol	<div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;">M_FX5UCPU_MBSV_StartPointTable</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution comandnd</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td>Execution status</td> </tr> <tr> <td>Station No.</td> <td>W: i_wStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Point Table No.</td> <td>UW: i_uPointNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Forward drive command</td> <td>B: i_bForward</td> <td>o_uErrld :UW</td> <td>Error code</td> </tr> <tr> <td>Reverse drive command</td> <td>B: i_bReverse</td> <td></td> <td></td> </tr> <tr> <td>Retry count No.</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> </div>	Execution comandnd	B: i_bEN	o_bENO :B	Execution status	Station No.	W: i_wStationNo	o_bOK :B	Normal completion	Point Table No.	UW: i_uPointNo	o_bErr :B	Error completion	Forward drive command	B: i_bForward	o_uErrld :UW	Error code	Reverse drive command	B: i_bReverse			Retry count No.	UW: i_uRetryCount		
Execution comandnd	B: i_bEN	o_bENO :B	Execution status																						
Station No.	W: i_wStationNo	o_bOK :B	Normal completion																						
Point Table No.	UW: i_uPointNo	o_bErr :B	Error completion																						
Forward drive command	B: i_bForward	o_uErrld :UW	Error code																						
Reverse drive command	B: i_bReverse																								
Retry count No.	UW: i_uRetryCount																								

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_wStationNo	Word [signed]	-1, 1 to 32	Specify the slave station number. To start multiple stations simultaneously, specify -1.
Point table No.	i_uPointNo	Word [unsigned]	For MR-JE-A: 1 to 31 For MR-J4-A: 1 to 255	Specify the point table number to start. When i_wStationNo (Station No.) has been set to -1, this label is invalid. Possible to change the setting after turning on i_bEN(excecuted command)
Forward rotation command	i_bForward	Bit	On or off	Turn on this label to perform the forward rotation. For the combination operation with i_bEN (Execution command) and i_bReverse (Reverse rotation command), refer to the following table. Possible to change the setting after turning on i_bEN(excecuted command)

Name (comment)	Label name	Data type	Setting range	Description
Reverse rotation command	i_bReverse	Bit	On or off	Turn on this label to perform the reverse rotation. For the combination operation with i_bEN (Execution command) and i_bForward (Forward rotation command), refer to the following table. Possible to change the setting after turning on i_bEN(excecuted command)
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

	Absolute value command method (PT01: "_ _ _ 0")					Incremental value command method (PT01: "_ _ _ 1")				
Execution command	On	On	On	On	Off	On	On	On	On	Off
Forward rotation command	On	Off	On	Off	-	On	Off	On	Off	-
Reverse rotation command	Off	On	On	Off	-	Off	On	On	Off	-
Positioning start	Started	Not started	Started	Not started	Not started	Forward rotation start	Reverse rotation start	Forward rotation start	Not started	Not started

●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that starting the positioning of the set point table has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	956 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	M_FX5UCPU_MBSV_SetPointTableData (Point table data setting), M_FX5UCPU_MBSV_SetMultiPositioning (Multi-axis simultaneous positioning start setting)
Processing	<ol style="list-style-type: none"> 1) Change control mode(6060h) to point table mode(-101) before trying FB. Setting in the control mode is other than point table mode, then o_bErr(error complete) is turned on and interrupt FB processing. Error code 10Fh is stored in o_uErrId(error code) 2) By using i_bEN (Execution command), i_bForward (Forward rotation command), and i_bReverse (Reverse rotation command), the positioning (point table) of a specified station number can be started. 3) o_bOK(normal completion) is turned on after positioning operation is completed normally. Then, next positioning can be started by setting the point table data to be operated next from i_uPointNo(Point table No) and i_bForward(CW command) or i_bReverse(CCW command) to select direction. 4) When i_wStationNo (Station No.) has been set to "-1" and i_bForward (Forward rotation command) or i_bReverse (Reverse rotation command) is input, the positioning operations on multiple stations can be started simultaneously. In this case, set stations, point table data, and point table numbers to be started using M_FX5UCPU_MBSV_SetPointTableData (Point table data setting) and M_FX5UCPU_MBSV_SetMultiPositioning (Multi-axis simultaneous positioning start setting) in advance. 5) If multi station's positioning operation is operated simultaneously, o_bOK(normal completion) is turned on. When multi stations are simulataneously initialized for positioning, servo on or stopped state is not recognized in this FB before execution. All stations need to be at servo on and stopped state before starting this FB. 6) If the setting value of the station 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 102h is stored in o_uErrId (Error code). 7) If the setting value of the point table No. 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 103h is stored in o_uErrId (Error code). 8) If this FB is excecuted while servo on or at starting state(setting other than 000F is set in control command(6040h)), FB processing is interrupted. Error code 106h is stored in o_uErrId (error code). 9) For details, refer to the list of error codes.
FB compilation method	Macro type

Item	Description
Restrictions or precautions	1) This FB operates the control instruction object (6040h). Thus, while this FB is being executed, be careful not to operate the control instruction object (6040h) of the same station outside the FB. 2) If you set the controlword(6040h) to 10Fh during moter rotation,moter stops. Please set the controlword(6040h) to 0Fh if you want to restart. If you set controlword(6040h) to 10Fh while the moter is stopped, HALT will be disabled at the time of start-up. 3) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	executed all times.
Timing chart of I/O signals	<p>【Case of successful termination】</p> <p>【Case of error termination】</p> <p>The timing chart illustrates the sequence of events for both successful and error termination. In the successful case, the execution command (i_bEN) starts, followed by the execution status (o_bENO) becoming active. Drive commands (i_bForward/i_bReverse) are then sent, leading to motor driving. Once completed, o_bOK is set, and the point table number (1 or 2) is output. In the error case, an error occurs during execution, setting o_bErr and outputting an error code (Error code) via o_uErrId.</p>

Error code

●List of error codes

Error code	Description	Action
102h	The set value of i_wStationNo (Station No.) is out of the setting range. The target station is not within the range of -1, or 1 to 32.	Try again after checking the setting.
103h	The set value of i_uPointNo (Point table No.) is out of the setting range.	Try again after checking the setting.
106h	FB is executed while servo off or at starting state(control command(6040h) is set other than 000Fh)	Retry after checking amplifier is servo on and stopped state.
10Ah	Parameter other than 00ABh is set in PrPA19	Retry after checking amplifier is servo on and stopped state.
10Fh	Control mode (6060h) is set other than point table mode(-101) setting.	Retry after point table mode(-101) is set in control mode(6060h)
111h	Modbus communication rety count exceeded the number set in i_uRetryCount (retry count)	Retry after checking the setting of FB Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.6. M_FX5UCPU_MBSV_StartProgram (Positioning operation start (program))

Name

M_FX5UCPU_MBSV_StartProgram

FB details

Item	Description																				
Function overview	Starts a positioning operation (program).																				
Symbol	<div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;">M_FX5UCPU_MBSV_StartProgram</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td>Execution status</td> </tr> <tr> <td>Station No.</td> <td>W: i_wStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Program No.</td> <td>UW: i_uProgramNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Forward drive No.</td> <td>B: i_bForward</td> <td>o_uErrld :UW</td> <td>Error code</td> </tr> <tr> <td>Retry count No.</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	W: i_wStationNo	o_bOK :B	Normal completion	Program No.	UW: i_uProgramNo	o_bErr :B	Error completion	Forward drive No.	B: i_bForward	o_uErrld :UW	Error code	Retry count No.	UW: i_uRetryCount		
Execution command	B: i_bEN	o_bENO :B	Execution status																		
Station No.	W: i_wStationNo	o_bOK :B	Normal completion																		
Program No.	UW: i_uProgramNo	o_bErr :B	Error completion																		
Forward drive No.	B: i_bForward	o_uErrld :UW	Error code																		
Retry count No.	UW: i_uRetryCount																				

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_wStationNo	Word [signed]	-1, 1 to 32	Specify the slave station number. To start multiple stations simultaneously, specify -1.
Program No.	i_uProgramNo	Word [unsigned]	For MR-JE-A: 1 to 16 For MR-J4-A: 1 to 256	Specify the program number to start. When i_wStationNo (Station No.) has been set to -1, this label is invalid. This program number can also be changed after turning on i_BEN (execute command).
Forward rotation command	i_bForward	Bit	On or off	Turn on this label to perform the forward rotation. For the combination operation with i_bEN (Execution command), refer to the following table. This program number can also be changed after turning on i_BEN(execute command).
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrld (error code). 0 setting is same as 1.

Execution command	On	On	On
Forward rotation command	On	Off	-
Positioning start	Forward rotation start	Not started	Not started

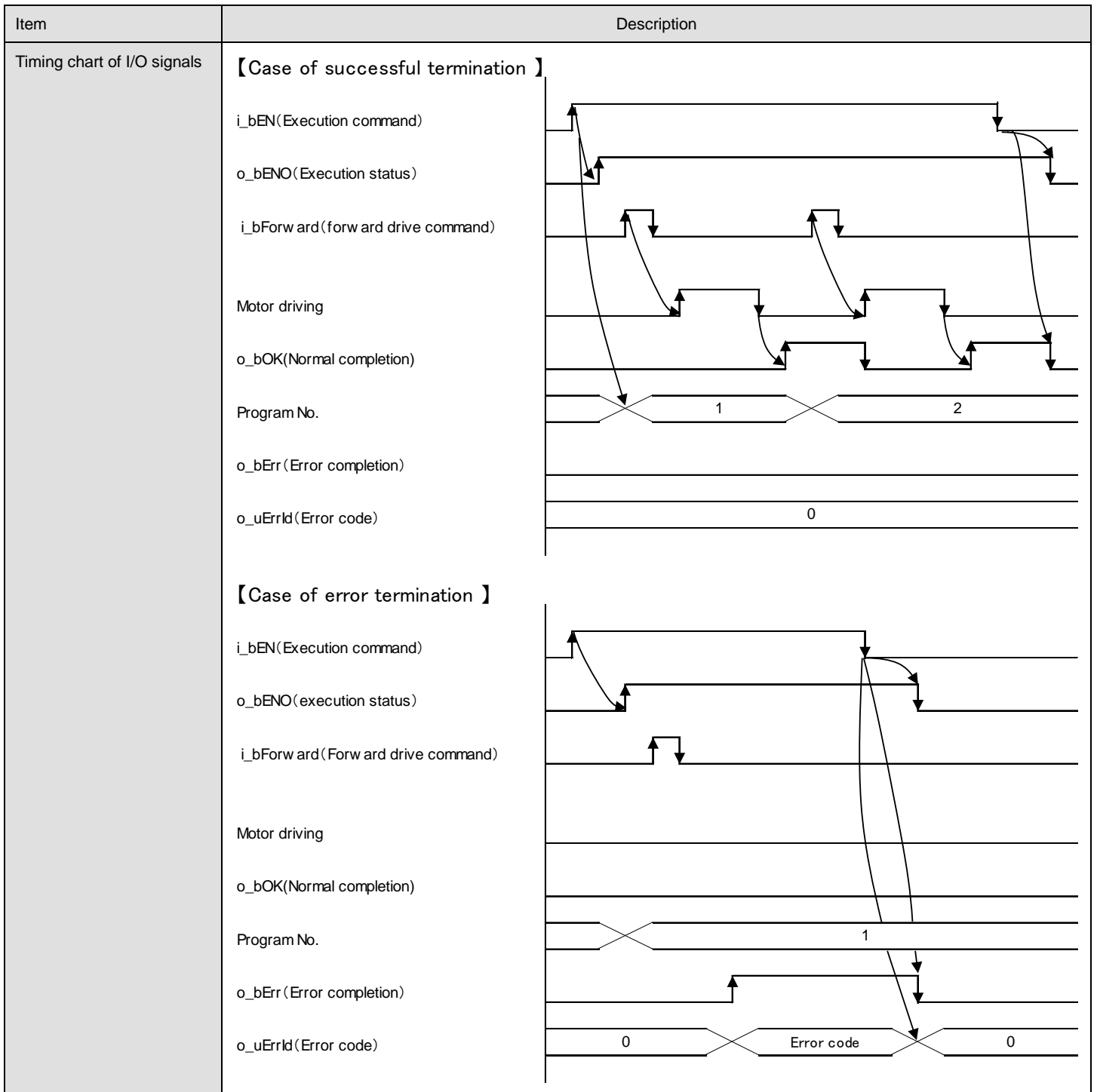
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that starting the positioning operation with a program has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	790 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) Control mode (6060h) need to be changed to program mode (-102) before initializing FB. If the control mode in the setting is other than program mode, o_bErr (error completion) is turned on, and stop processing FB. Also, error code 110h is stored in o_uErrld (error code). 2) By using i_bEN (Execution command) and i_bForward (Forward rotation command), the positioning (program) of a specified station number can be started. (Set the program data using MR Configurator2 in advance.) 3) o_bOK (normal completion) is turned on after positioning operation is completed normally. Then, next positioning can be started by setting the program No to be operated from i_uProgramNo (Program No) and i_bForward (CW command). 4) If multi station's positioning operation is operated simultaneously, o_bOK (normal completion) is turned on. When multi stations are simulataneously initialized to positioning, servo on or stopped state is not recognized in this FB before execution. All stations need to be at servo on and stopped state before starting this FB. FB need to be servo on and FB will not operate if multi stations are servo off. 5) If the setting value of the station 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 102h is stored in o_uErrld (Error code). 6) If the setting value of the program No. 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 104 h is stored in o_uErrld (Error code). 7) If this FB is excecuted while servo on or at starting state (setting other than 000F is set in control command (6040h)), FB processing is interrupted. Error code 106h is stored in o_uErrld (error code). 8) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	<ol style="list-style-type: none"> 1) This FB operates the control instruction object (6040h). Thus, while this FB is being executed, be careful not to operate the control instruction object (6040h) of the same station outside the FB. 2) If you set the controlword(6040h) to 10Fh during moter rotation,moter stops. Please set the controlword(6040h) to 0Fh if you want to restart. If you set controlword(6040h) to 10Fh while the moter is stopped, HALT will be disabled at the time of start-up. 3) Even after i_bEN (Execution command) has been turned on, i_bForward (Forward rotation command) can be changed. 4) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Always executed



Error code

●List of error codes

Error code	Description	Action
102h	The set value of i_wStationNo (Station No.) is out of the setting range. The target station is not within the range of -1, or 1 to 32.	Try again after checking the setting.
104h	The set value of i_uProgramNo (Program No.) is out of the setting range.	Try again after checking the setting.
106h	FB is executed while servo off or at starting state(control command(6040h) is set other than 000Fh)	Retry after checking amplifier is servo on and stopped state.
110h	Control mode (6060h) is set other than program mode(-102) setting.	Retry after point table mode(-101) is set in control mode(6060h)
111h	Modbus communication rety count exceeded the numberset in i_uRetryCount (retry count)	Retry after checking the setting of FB. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.7. M_FX5UCPU_MBSV_SetMultiPositioning (Multi-axis simultaneous positioning start setting)

Name

M_FX5UCPU_MBSV_SetMultiPositioning

FB details

Item	Description																								
Function overview	Sets the simultaneous start of positioning operations on multiple axes.																								
Symbol	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">M_FX5UCPU_MBSV_SetMultiPositioning</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td>Control mode</td> <td>B: i_bControlMode</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Connected station selection</td> <td>UD: i_udConnectedStationNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Starting station selection</td> <td>UD: i_udStartingStationNo</td> <td>o_uErrId :UW</td> <td>Error code</td> </tr> <tr> <td>Station No.start command No.</td> <td>UW: i_u32StartPointProgNo</td> <td></td> <td></td> </tr> <tr> <td>Retry count No.</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Control mode	B: i_bControlMode	o_bOK :B	Normal completion	Connected station selection	UD: i_udConnectedStationNo	o_bErr :B	Error completion	Starting station selection	UD: i_udStartingStationNo	o_uErrId :UW	Error code	Station No.start command No.	UW: i_u32StartPointProgNo			Retry count No.	UW: i_uRetryCount		
Execution command	B: i_bEN	o_bENO :B	Execution status																						
Control mode	B: i_bControlMode	o_bOK :B	Normal completion																						
Connected station selection	UD: i_udConnectedStationNo	o_bErr :B	Error completion																						
Starting station selection	UD: i_udStartingStationNo	o_uErrId :UW	Error code																						
Station No.start command No.	UW: i_u32StartPointProgNo																								
Retry count No.	UW: i_uRetryCount																								

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description																
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.																
Control mode	i_bControlMode	Bit	On or off	Select the positioning mode of the servo amplifier used. On: Program method Off: Point table method																
Connected station selection	i_udConnectedStation No	Double word [unsigned]	Refer to the Description column.	Select the servo amplifiers connected to Modbus-RTU. <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; margin: 0 auto;"> <tr> <td style="padding: 2px;">b</td> <td style="padding: 2px;">31</td> <td style="padding: 2px;">30</td> <td style="padding: 2px;">29</td> <td style="padding: 2px;">...</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Station</td> <td style="padding: 2px;">32</td> <td style="padding: 2px;">31</td> <td style="padding: 2px;">30</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">1</td> </tr> </table> <p style="margin: 0;">└─ 1: Connected 0: Not connected</p> </div> Select "0: Not connected" for slave devices that do not support this FB.	b	31	30	29	...	2	1	0	Station	32	31	30		3	2	1
b	31	30	29	...	2	1	0													
Station	32	31	30		3	2	1													
Starting station selection	i_udStartingStationNo	Double word [unsigned]	Refer to the Description column.	Select stations to start simultaneously. <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; margin: 0 auto;"> <tr> <td style="padding: 2px;">b</td> <td style="padding: 2px;">31</td> <td style="padding: 2px;">30</td> <td style="padding: 2px;">29</td> <td style="padding: 2px;">...</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Station</td> <td style="padding: 2px;">32</td> <td style="padding: 2px;">31</td> <td style="padding: 2px;">30</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">1</td> </tr> </table> <p style="margin: 0;">└─ 1: Started simultaneously 0: Not started simultaneously</p> </div>	b	31	30	29	...	2	1	0	Station	32	31	30		3	2	1
b	31	30	29	...	2	1	0													
Station	32	31	30		3	2	1													

Name (comment)	Label name	Data type	Setting range	Description																																																																																																			
Station No. start command No.	i_u32StartPointProgNo	Word [unsigned] (0..31)	[Point table method] For MR-JE-A: 1 to 31 For MR-J4-A: 1 to 255 [Program method] For MR-JE-A: 1 to 16 For MR-J4-A: 1 to 256	Specify the point table number or program number to start of the station number set in i_udStationStartNo (Starting station selection). Enter word data to 32 stations in ascending order from the station number 1. (Set only the devices corresponding to the station numbers to be started simultaneously.) To specify the numbers using labels, use Array for the data type. The following table shows an example of when 5, 10, and 16 are set in the point table No. 1, 3, and 20 respectively of the station numbers to be started simultaneously. In this example, the devices D0 to D31 are used for setting the values. Enter D0 in i_u32StartPointProgNo. <table border="1"> <thead> <tr> <th>Station No.</th> <th>Device</th> <th>Setting value</th> <th>Station No.</th> <th>Device</th> <th>Setting value</th> <th>Station No.</th> <th>Device</th> <th>Setting value</th> </tr> </thead> <tbody> <tr><td>1</td><td>D0</td><td>5</td><td>12</td><td>D11</td><td>-</td><td>23</td><td>D22</td><td>-</td></tr> <tr><td>2</td><td>D1</td><td>-</td><td>13</td><td>D12</td><td>-</td><td>24</td><td>D23</td><td>-</td></tr> <tr><td>3</td><td>D2</td><td>10</td><td>14</td><td>D13</td><td>-</td><td>25</td><td>D24</td><td>-</td></tr> <tr><td>4</td><td>D3</td><td>-</td><td>15</td><td>D14</td><td>-</td><td>26</td><td>D25</td><td>-</td></tr> <tr><td>5</td><td>D4</td><td>-</td><td>16</td><td>D15</td><td>-</td><td>27</td><td>D26</td><td>-</td></tr> <tr><td>6</td><td>D5</td><td>-</td><td>17</td><td>D16</td><td>-</td><td>28</td><td>D27</td><td>-</td></tr> <tr><td>7</td><td>D6</td><td>-</td><td>18</td><td>D17</td><td>-</td><td>29</td><td>D28</td><td>-</td></tr> <tr><td>8</td><td>D7</td><td>-</td><td>19</td><td>D18</td><td>-</td><td>30</td><td>D29</td><td>-</td></tr> <tr><td>9</td><td>D8</td><td>-</td><td>20</td><td>D19</td><td>16</td><td>31</td><td>D30</td><td>-</td></tr> <tr><td>10</td><td>D9</td><td>-</td><td>21</td><td>D20</td><td>-</td><td>32</td><td>D31</td><td>-</td></tr> </tbody> </table> The range of i_u32StartPointProgNo (Station Starting Command No.) is not checked. And the station out of range is not operated.	Station No.	Device	Setting value	Station No.	Device	Setting value	Station No.	Device	Setting value	1	D0	5	12	D11	-	23	D22	-	2	D1	-	13	D12	-	24	D23	-	3	D2	10	14	D13	-	25	D24	-	4	D3	-	15	D14	-	26	D25	-	5	D4	-	16	D15	-	27	D26	-	6	D5	-	17	D16	-	28	D27	-	7	D6	-	18	D17	-	29	D28	-	8	D7	-	19	D18	-	30	D29	-	9	D8	-	20	D19	16	31	D30	-	10	D9	-	21	D20	-	32	D31	-
Station No.	Device	Setting value	Station No.	Device	Setting value	Station No.	Device	Setting value																																																																																															
1	D0	5	12	D11	-	23	D22	-																																																																																															
2	D1	-	13	D12	-	24	D23	-																																																																																															
3	D2	10	14	D13	-	25	D24	-																																																																																															
4	D3	-	15	D14	-	26	D25	-																																																																																															
5	D4	-	16	D15	-	27	D26	-																																																																																															
6	D5	-	17	D16	-	28	D27	-																																																																																															
7	D6	-	18	D17	-	29	D28	-																																																																																															
8	D7	-	19	D18	-	30	D29	-																																																																																															
9	D8	-	20	D19	16	31	D30	-																																																																																															
10	D9	-	21	D20	-	32	D31	-																																																																																															
Retry Count No.	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.																																																																																																			

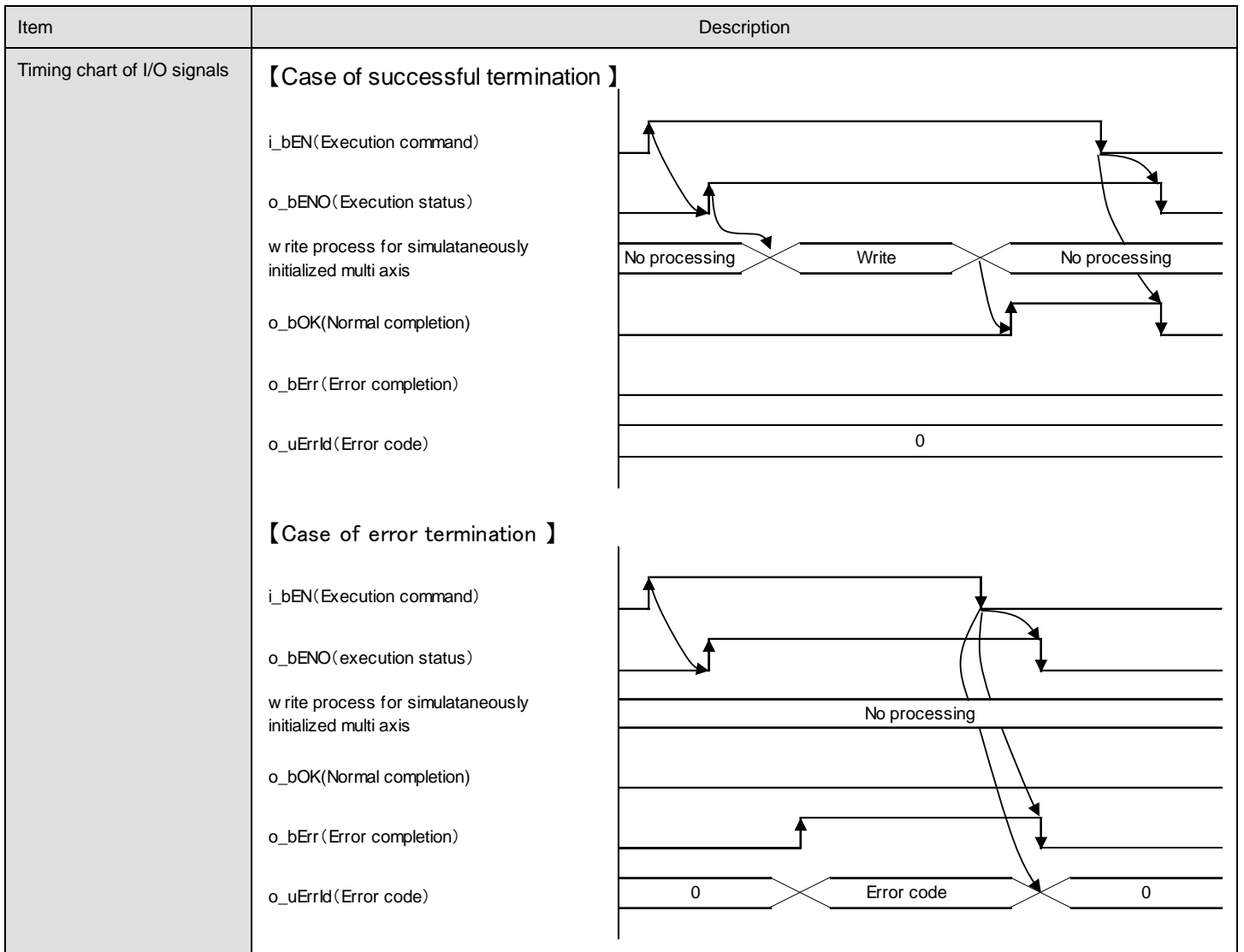
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that the simultaneous start setting of the positioning operations on multiple axes has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	481 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	M_FX5UCPU_MBSV_SetPointTableData (Point table data setting)
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the station numbers to be started simultaneously and point table numbers to be started are set. 2) Set the point table data of each station to be started simultaneously using 2.1. M_FX5UCPU_MBSV_SetPointTableData (Point table data setting). 3) Execute the simultaneous start using 2.5. M_FX5UCPU_MBSV_StartPointTable (Positioning operation start (point table)) or 2.6. M_FX5UCPU_MBSV_StartProgram (Positioning operation start (program)) 4) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 5) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	<ol style="list-style-type: none"> 1) When FB is operated in condition that actual mode is different from setting in Control mode, setting is reflected 2) When you use this FB, set the controlword(6060h) to the point table mode(-101). If you run this FB in the program mode, the program data may get corrupted. 3) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
10Ch	I_udStartingStationNo (starting station selection) is "0". Starting station is not selected.	Retry after checking the setting of FB
111h	Modbus communication rety count exceeded the number set in i_uRetryCount (retry count)	Retry after checking the setting of FB. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.8. M_FX5UCPU_MBSV_ResetALMHistory (Servo alarm history clear setting)

Name

M_FX5UCPU_MBSV_ResetALMHistory

FB details

Item	Description
Function overview	Clears the servo alarm history.
Symbol	

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Retry Count No.	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrld (error code). 0 setting is same as 1.

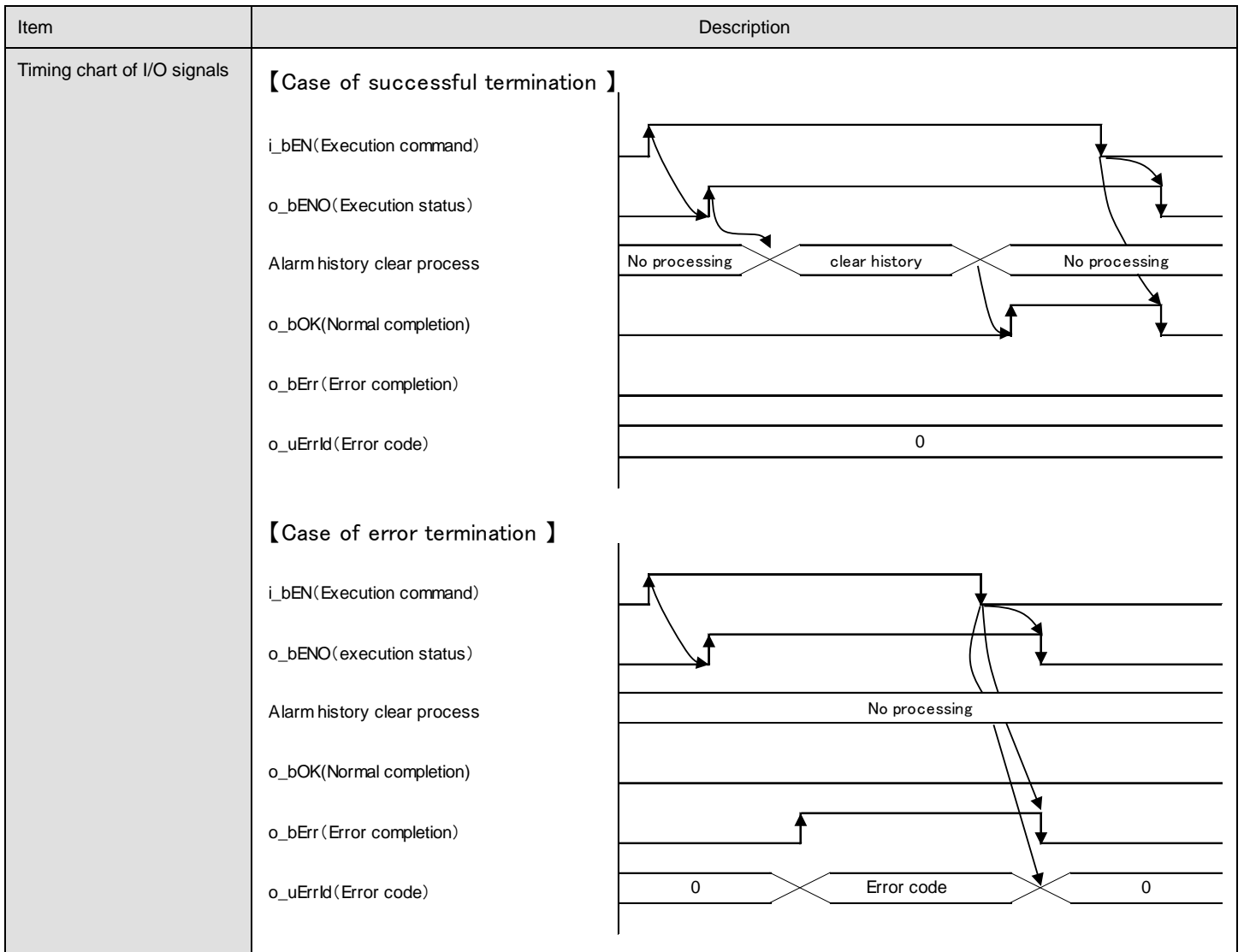
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that clearing the servo alarm history has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrld	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	145 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the alarm history of the servo amplifier with a specified station number is cleared. 2) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 3) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	1) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
111h	Modbus communication retry count i_uRetryCount (rety count number) exceeded the number set.	Retry after checking the setting. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.9. M_FX5UCPU_MBSV_SetMarkDetect (Current position data latch at mark detection)

Name

M_FX5UCPU_MBSV_SetMarkDetect

FB details

Item	Description																				
Function overview	Sets the current position data latch at mark detection.																				
Symbol	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">M_FX5UCPU_MBSV_SetMarkDetect</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execute command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td>Station number</td> <td>UW: i_uStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Window upper limit value</td> <td>D: i_dWindowUpperLimit</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Window lower limit value</td> <td>D: i_dWindowLowerLimit</td> <td>o_uErrld :UW</td> <td>Error code</td> </tr> <tr> <td>Retry count No.</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> </div>	Execute command	B: i_bEN	o_bENO :B	Execution status	Station number	UW: i_uStationNo	o_bOK :B	Normal completion	Window upper limit value	D: i_dWindowUpperLimit	o_bErr :B	Error completion	Window lower limit value	D: i_dWindowLowerLimit	o_uErrld :UW	Error code	Retry count No.	UW: i_uRetryCount		
Execute command	B: i_bEN	o_bENO :B	Execution status																		
Station number	UW: i_uStationNo	o_bOK :B	Normal completion																		
Window upper limit value	D: i_dWindowUpperLimit	o_bErr :B	Error completion																		
Window lower limit value	D: i_dWindowLowerLimit	o_uErrld :UW	Error code																		
Retry count No.	UW: i_uRetryCount																				

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Window upper limit value	i_dWindowUpperLimit	Double word [signed]	-999999 to 999999 $\times 10^{\text{STM}}$ μm $\times 10^{(\text{STM}-4)}$ inch pulse -360000 to 360000 $\times 10^{-3}$ degree *	Set the latch data upper limit value for when the current position is latched. The current position is latched only when the data is within the range between the window upper limit value and window lower limit value. If a single value has been set for both the window upper limit value and window lower limit value, the current position will be latched in all the setting ranges. For details, refer to the instruction manual of the servo amplifier used.

Name (comment)	Label name	Data type	Setting range	Description
Window lower limit value	i_dWindowLowerLimit	Double word [signed]	-999999 to 999999 $\times 10^{\text{STM}} \mu\text{m}$ $\times 10^{(\text{STM}-4)} \text{inch}$ pulse -360000 to 360000 $\times 10^{-3} \text{degree}$ *	Set the latch data lower limit value for when the current position is latched. The current position is latched only when the data is within the range between the window upper limit value and window lower limit value. If a single value has been set for both the window upper limit value and window lower limit value, the current position will be latched in all the setting ranges. For details, refer to the instruction manual of the servo amplifier used.
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

* Refer to 2.1 Disclosed labels*1

●Output labels

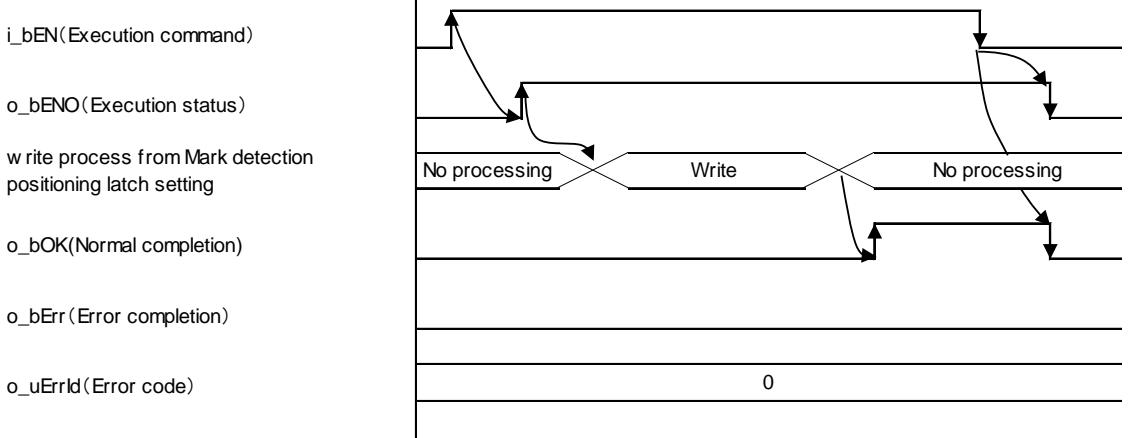
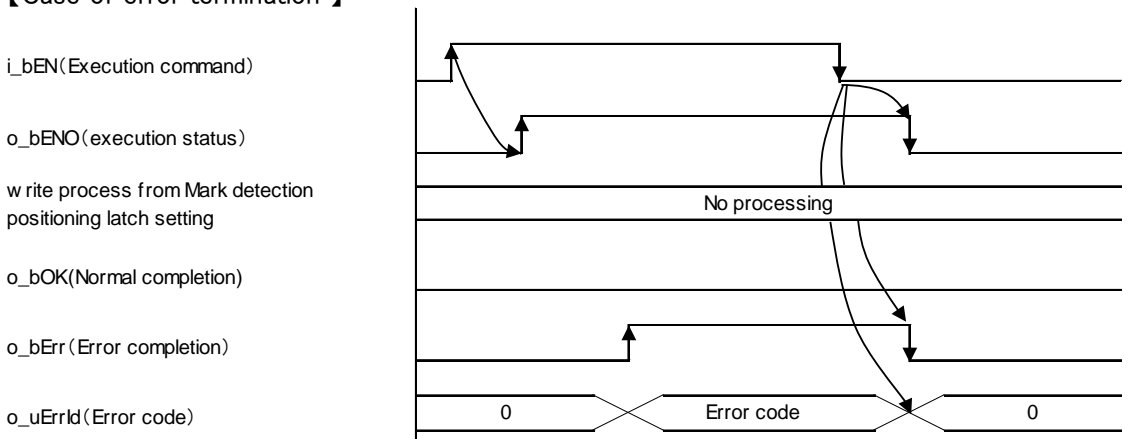
Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that the mark detection setting has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	586 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.

Item	Description																																																																														
FB dependency relation	M_FX5UCPU_MBSV_ReadMarkDetect (Read current position data latched at mark detection), M_FX5UCPU_MBSV_SetMarkDetectPositioning (Interrupt positioning at mark detection)																																																																														
Processing	<p>1) By turning on i_bEN (Execution command), the current position data latch at mark detection of a specified station number is set.</p> <p>2) If the setting value of the station 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 100h is stored in o_uErrld (Error code).</p> <p>3) If the setting is out of upper and lower window limitation range, o_bErr (error complete) is turned on. Then FB is interrupted and stop execution. Also, o_uErrld (error code) is stored into error code 107h.</p> <p>4) For details, refer to the list of error codes.</p> <p>5) To read the current position data latched at mark detection, use M_FX5UCPU_MBSV_ReadMarkDetect (Read current position data latched at mark detection).</p> <p>6) To use the mark detection function, assign (1) Mark detection function selection (Pr. PT26) and (2) Mark detection device (MSD) using MR Configurator2 or M_FX5UCPU_MBSV_SetSVParamData (Servo parameter data setting). <u>To change these servo amplifier settings, configure the settings and power off and on the servo amplifier to apply the new values.</u></p> <p>(1) Mark detection function selection (Pr. PT26)</p> <p>Setting "x ___" of Pr. PT26 to 0h enables the current position latch function by sensor input. Setting "x ___" of Pr. PT26 to 1h enables the interrupt positioning function by sensor input.</p> <p>(2) Mark detection device (MSD) assignment</p> <p>Assign Mark detection device (MSD) to one of the external inputs DI1 to DI12. For the correspondences of the external inputs and CN1 connector pins, refer to the following table.</p> <p>To assign MSD, set "x x _" of Pr. PD** of the DI used to 12h.</p> <table border="1" data-bbox="432 1301 1313 1798"> <tbody> <tr> <td>Device</td> <td></td> <td>DI1H</td> <td>DI2H</td> <td>DI3H</td> <td>DI4H</td> <td>DI5H</td> <td>DI6H</td> </tr> <tr> <td>CN1 connector pin No.</td> <td></td> <td>15</td> <td>16</td> <td>17</td> <td>18</td> <td>19</td> <td>41</td> </tr> <tr> <td>Setting parameter</td> <td></td> <td>PD04</td> <td>PD06</td> <td>PD08</td> <td>PD10</td> <td>PD12</td> <td>PD14</td> </tr> <tr> <td rowspan="2">Settable/Not settable</td> <td>MR-JEA</td> <td>○</td> <td>×</td> <td>×</td> <td>×</td> <td>○</td> <td>○</td> </tr> <tr> <td>MR-J4A</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>Device</td> <td></td> <td>DI7H</td> <td>DI8H</td> <td>DI9H</td> <td>DI10H</td> <td>DI11H</td> <td>DI12H</td> </tr> <tr> <td>CN1 connector pin No.</td> <td></td> <td>42</td> <td>43</td> <td>44</td> <td>45</td> <td>10</td> <td>35</td> </tr> <tr> <td>Setting parameter</td> <td></td> <td>PD16</td> <td>PD18</td> <td>PD20</td> <td>PD22</td> <td>PD44</td> <td>PD46</td> </tr> <tr> <td rowspan="2">Settable/Not settable</td> <td>MR-JEA</td> <td>○</td> <td>○</td> <td>○</td> <td>×</td> <td>○</td> <td>○</td> </tr> <tr> <td>MR-J4A</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> </tr> </tbody> </table> <p>When the current position data latch function is disabled, please turn OFF the touch probe function settings in 60B8h bit[0,4,5].</p>	Device		DI1H	DI2H	DI3H	DI4H	DI5H	DI6H	CN1 connector pin No.		15	16	17	18	19	41	Setting parameter		PD04	PD06	PD08	PD10	PD12	PD14	Settable/Not settable	MR-JEA	○	×	×	×	○	○	MR-J4A	○	○	○	○	○	○	Device		DI7H	DI8H	DI9H	DI10H	DI11H	DI12H	CN1 connector pin No.		42	43	44	45	10	35	Setting parameter		PD16	PD18	PD20	PD22	PD44	PD46	Settable/Not settable	MR-JEA	○	○	○	×	○	○	MR-J4A	○	○	○	○	○	○
Device		DI1H	DI2H	DI3H	DI4H	DI5H	DI6H																																																																								
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Settable/Not settable	MR-JEA	○	×	×	×	○	○																																																																								
	MR-J4A	○	○	○	○	○	○																																																																								
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	MR-J4A	○	○	○	○	○	○																																																																								
FB compilation method	Macro type																																																																														

Item	Description
Restrictions or precautions	1) This FB can be used only when the positioning mode (point table method or program method) is selected in the basic parameter PA01 (*STY) of the servo amplifier. 2) The current position data latch function at mark detection and the interrupt positioning function are mutually exclusive. When using the current position data latch function in this FB, do not start 2.11. M_FX5UCPU_MBSV_SetMarkDetectPositioning (Interrupt positioning at mark detection). 3) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)
Timing chart of I/O signals	<p>【Case of successful termination】</p>  <p>The timing chart for successful termination shows the following sequence of events:</p> <ul style="list-style-type: none"> i_bEN (Execution command): A single pulse that starts the process. o_bENO (Execution status): Transitions from 0 to 1 at the start of the pulse and returns to 0 after the pulse ends. write process from Mark detection positioning latch setting: A signal that transitions from "No processing" to "Write" during the pulse and returns to "No processing" after the pulse ends. o_bOK (Normal completion): Transitions from 0 to 1 at the end of the pulse and returns to 0 after a short delay. o_bErr (Error completion): Remains at 0 throughout the process. o_uErrId (Error code): Remains at 0 throughout the process. <p>【Case of error termination】</p>  <p>The timing chart for error termination shows the following sequence of events:</p> <ul style="list-style-type: none"> i_bEN (Execution command): A single pulse that starts the process. o_bENO (execution status): Transitions from 0 to 1 at the start of the pulse and returns to 0 after the pulse ends. write process from Mark detection positioning latch setting: Remains at "No processing" throughout the process. o_bOK (Normal completion): Remains at 0 throughout the process. o_bErr (Error completion): Transitions from 0 to 1 at the end of the pulse and returns to 0 after a short delay. o_uErrId (Error code): Transitions from 0 to "Error code" at the end of the pulse and returns to 0 after a short delay.

Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
107h	i_dWindowUpperLimit (window upper limit) 、 ori_dWindowLowerLimit (window lower limit) setting is out of range.	Try after checking the setting.
10Ah	Parameter other than 00ABh is set in PrPA19,	Try after checking the setting.
111h	Modbus communication retry count i_uRetryCount (rety count number) exceeded the number set.	Try again after checking the setting. Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.10. M_FX5UCPU_MBSV_ReadMarkDetect (Read current position data latched at mark detection)

Name

M_FX5UCPU_MBSV_ReadMarkDetect

FB details

Item	Description																																				
Function overview	Reads the current position data latched by sensor input.																																				
Symbol	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">M_FX5UCPU_MBSV_ReadMarkDetect</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td>Station number</td> <td>UW: i_uStationNo</td> <td></td> <td></td> </tr> <tr> <td>Retry count</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 30%;"></td> <td style="width: 30%;">o_bENO :B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td></td> <td></td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td></td> <td></td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td></td> <td></td> <td>o_uErrId :UW</td> <td>Error code</td> </tr> <tr> <td></td> <td></td> <td>o_dPositionPositive :D</td> <td>Current position rise up latch data</td> </tr> <tr> <td></td> <td></td> <td>o_dPositionNegative :D</td> <td>Current position fall down latch dat</td> </tr> </table> </div>	Execution command	B: i_bEN			Station number	UW: i_uStationNo			Retry count	UW: i_uRetryCount					o_bENO :B	Execution status			o_bOK :B	Normal completion			o_bErr :B	Error completion			o_uErrId :UW	Error code			o_dPositionPositive :D	Current position rise up latch data			o_dPositionNegative :D	Current position fall down latch dat
Execution command	B: i_bEN																																				
Station number	UW: i_uStationNo																																				
Retry count	UW: i_uRetryCount																																				
		o_bENO :B	Execution status																																		
		o_bOK :B	Normal completion																																		
		o_bErr :B	Error completion																																		
		o_uErrId :UW	Error code																																		
		o_dPositionPositive :D	Current position rise up latch data																																		
		o_dPositionNegative :D	Current position fall down latch dat																																		

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

●Output labels

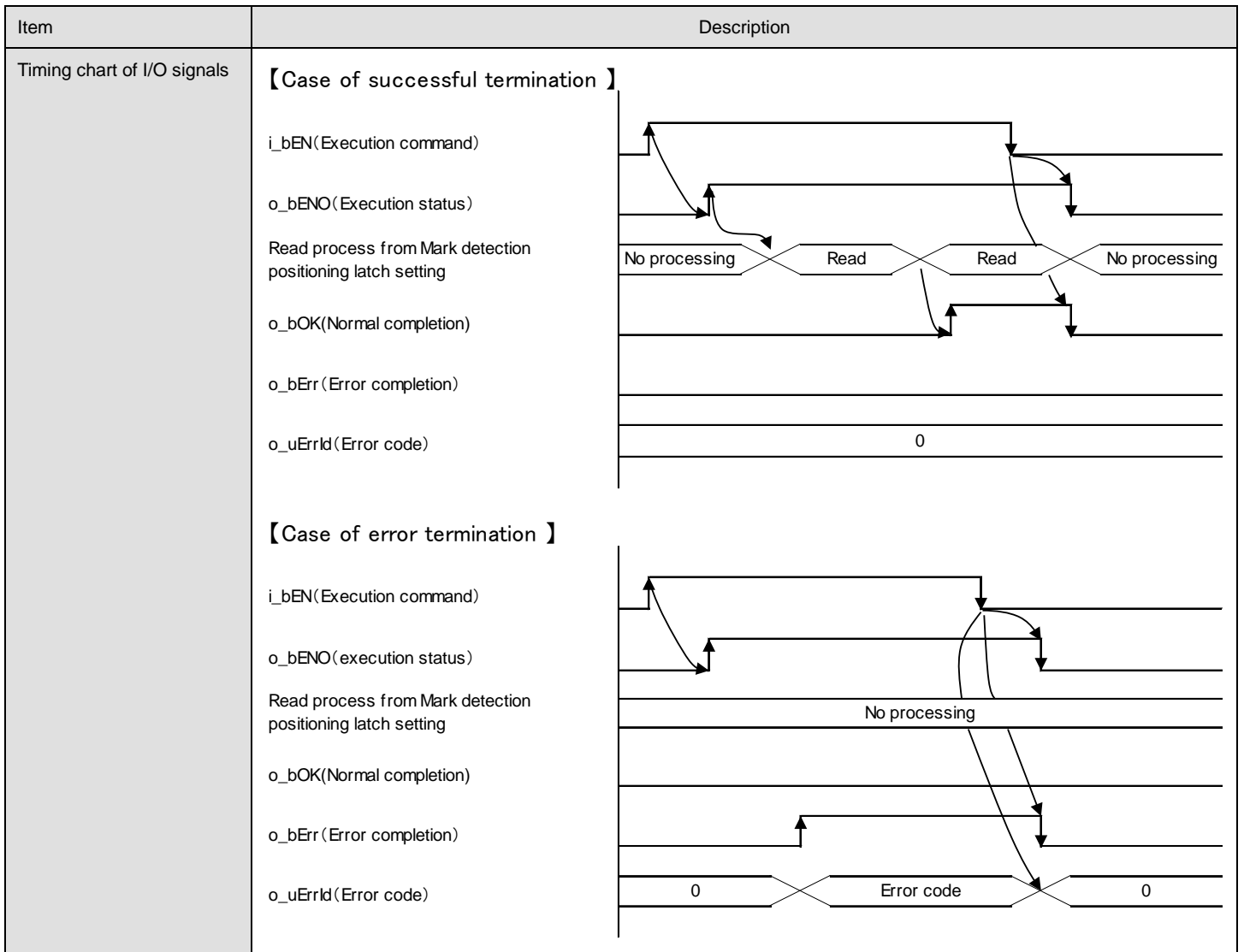
Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that reading the latched current position data at sensor input has been completed. However, this label does not turn on if a module error has occurred at the start.

Name (comment)	Label name	Data type	Initial value	Description
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.
Current position data latched at rising	o_dPositionPositive	Double word [signed]	0	The latched current position data at the rising of sensor input is read.
Current position data latched at falling	o_dPositionNegative	Double word [signed]	0	The latched current position data at the falling of sensor input is read.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	181 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	M_FX5UCPU_MBSV_SetMarkDetect (Current position data latch at mark detection)
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the latched current position data of a specified station number is read. 2) While i_bEN (Execution command) is on, o_dPositionPositive (Current position data latched at rising) and o_dPositionNegative (Current position data latched at falling) are continuously updated. 3) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 4) For details, refer to the list of error codes. 5) To set the mark detection, use M_FX5UCPU_MBSV_SetMarkDetect (Current position data latch at mark detection).
FB compilation method	Macro type
Restrictions or precautions	<ol style="list-style-type: none"> 1) This FB can be used only when the positioning mode is selected in the basic parameter PA01 (*STY) of the servo amplifier. 2) The current position data latch function at mark detection and the interrupt positioning function are mutually exclusive. When using the current position data latch function in this FB, do not start 2.11. M_FX5UCPU_MBSV_SetMarkDetectPositioning (Interrupt positioning at mark detection). 3) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Always executed



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
111h	Modbus communication rety count exceeded the number set in i_uRetryCount (retry count)	Retry after checking the setting of FB. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.11. M_FX5UCPU_MBSV_SetMarkDetectPositioning (Interrupt positioning at mark detection)

Name

M_FX5UCPU_MBSV_SetMarkDetectPositioning

FB details

Item	Description																								
Function overview	Sets interrupt positioning function data.																								
Symbol	<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p style="text-align: center;">M_FX5UCPU_MBSV_SetMarkDetectPositioning</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td>Station No.</td> <td>UW: i_uStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Window upper limit value</td> <td>D: i_dWindowUpperLimit</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Window lower limit value</td> <td>D: i_dWindowLowerLimit</td> <td>o_uErrId :UW</td> <td>Error code</td> </tr> <tr> <td>l travel distance for positioning</td> <td>UD: i_udPositTravelDist</td> <td></td> <td></td> </tr> <tr> <td>Retry Count No.</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Window upper limit value	D: i_dWindowUpperLimit	o_bErr :B	Error completion	Window lower limit value	D: i_dWindowLowerLimit	o_uErrId :UW	Error code	l travel distance for positioning	UD: i_udPositTravelDist			Retry Count No.	UW: i_uRetryCount		
Execution command	B: i_bEN	o_bENO :B	Execution status																						
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion																						
Window upper limit value	D: i_dWindowUpperLimit	o_bErr :B	Error completion																						
Window lower limit value	D: i_dWindowLowerLimit	o_uErrId :UW	Error code																						
l travel distance for positioning	UD: i_udPositTravelDist																								
Retry Count No.	UW: i_uRetryCount																								

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number. Do not change i_uStationNo (Station No.) while i_bEN (Execution command) is on.
Window upper limit value	i_dWindowUpperLimit	Double word [signed]	-999999 to 999999 $\times 10^{\text{STM}}$ μm $\times 10^{(\text{STM}-4)}$ inch pulse -360000 to 360000 $\times 10^{-3}$ degree *1	Set the latch data upper limit value for when the current position is latched. The current position is latched only when the data is within the range between the window upper limit value and window lower limit value. If a single value has been set for both the window upper limit value and window lower limit value, the current position will be latched in all the setting ranges. For details, refer to the instruction manual of the servo amplifier used.

Name (comment)	Label name	Data type	Setting range	Description
Window lower limit value	i_dWindowLowerLimit	Double word [signed]	-999999 to 999999 $\times 10^{\text{STM}} \mu\text{m}$ $\times 10^{(\text{STM}-4)} \text{inch}$ pulse -360000 to 360000 $\times 10^{-3} \text{degree}$ *1	Set the latch data lower limit value for when the current position is latched. The current position is latched only when the data is within the range between the window upper limit value and window lower limit value. If a single value has been set for both the window upper limit value and window lower limit value, the current position will be latched in all the setting ranges. For details, refer to the instruction manual of the servo amplifier used.
Interrupt positioning travel distance	i_udPositTravelDist	Double word [unsigned]	1 to 999999 $\times 10^{\text{STM}} \mu\text{m}$ $\times 10^{(\text{STM}-4)} \text{inch}$ pulse 0 to 360000 $\times 10^{-3} \text{degree}$ *1	Set the travel distance after the mark detection input of the station specified in i_uStationNo (Station No.). It is possible to change after turning on i_bEN(command control)
Retry count	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

*1 STM(Feed length multiplication)

This function is available when point table mode or program mode.

This function is disabled when the position data unit of "degree" or "pulse".

●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that the interrupt positioning setting for sensor input has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	713 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	M_FX5UCPU_MBSV_SetMarkDetect (Current position data latch at mark detection)

Item	Description																																																																																
Processing	<p>1) By turning on i_bEN (Execution command), the interrupt positioning of a specified station number is set. The interrupt positioning function performs operations in which the residual distance is changed to the travel distance set in Mark sensor stop travel distance (Pr. PT30 and 31) when the mark detection device (MSD) is input. For details of the interrupt positioning, refer to the instruction manual of the servo amplifier used.</p> <p>2) If the setting value of the station 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 100h is stored in o_uErrId (Error code).</p> <p>3) o_bErr (error completion) is turned and stop FB if the setting is outside the range of window upper and lower limit. Also, error code 107h is saved in o_uErrId (error code).</p> <p>4) o_bErr (error completion) is turned on and processing of the FB is stopped, if interrupted positioning amount of movement data setting is out of range. Then error code 108h is stored in o_uErrId (error code).</p> <p>5) For details, refer to the list of error codes.</p> <p>6) To use the mark detection function, assign (1) Mark detection function selection (Pr. PT26) and (2) Mark detection device (MSD) using MR Configurator2 or M_FX5UCPU_MBSV_SetSVParamData (Servo parameter data setting). To change these servo amplifier settings, configure the settings and power off and on the servo amplifier to apply the new values. Enabling these settings immediately enables the interrupt positioning function.</p> <p>(1) Mark detection function selection (Pr. PT26)</p> <p>Setting "x ___" of Pr. PT26 to 1h enables the interrupt positioning function by sensor input. Setting "x ___" of Pr. PT26 to 0h enables the current position latch function by sensor input.</p> <p>(2) Mark detection device (MSD) assignment</p> <p>Assign Mark detection device (MSD) to one of the external inputs DI1 to DI12. For the correspondences of the external inputs and CN1 connector pins, refer to the following table.</p> <p>To assign MSD, set "x x _" of Pr. PD** of the DI used to 12h.</p> <table border="1" data-bbox="432 1252 1313 1749"> <tbody> <tr> <td>Device</td> <td></td> <td>DI1H</td> <td>DI2H</td> <td>DI3H</td> <td>DI4H</td> <td>DI5H</td> <td>DI6H</td> </tr> <tr> <td>CN1 connector pin No.</td> <td></td> <td>15</td> <td>16</td> <td>17</td> <td>18</td> <td>19</td> <td>41</td> </tr> <tr> <td>Setting parameter</td> <td></td> <td>PD04</td> <td>PD06</td> <td>PD08</td> <td>PD10</td> <td>PD12</td> <td>PD14</td> </tr> <tr> <td>Settable/Not settable</td> <td>MR-JEA</td> <td>○</td> <td>×</td> <td>×</td> <td>×</td> <td>○</td> <td>○</td> </tr> <tr> <td></td> <td>MR-J4A</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>Device</td> <td></td> <td>DI7H</td> <td>DI8H</td> <td>DI9H</td> <td>DI10H</td> <td>DI11H</td> <td>DI12H</td> </tr> <tr> <td>CN1 connector pin No.</td> <td></td> <td>42</td> <td>43</td> <td>44</td> <td>45</td> <td>10</td> <td>35</td> </tr> <tr> <td>Setting parameter</td> <td></td> <td>PD16</td> <td>PD18</td> <td>PD20</td> <td>PD22</td> <td>PD44</td> <td>PD46</td> </tr> <tr> <td>Settable/Not settable</td> <td>MR-JEA</td> <td>○</td> <td>○</td> <td>○</td> <td>×</td> <td>○</td> <td>○</td> </tr> <tr> <td></td> <td>MR-J4A</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> </tr> </tbody> </table> <p>7) The polarity of the mark detection device (MSD) can be changed using Pr. PT29. To change the setting, configure the settings and power off and on the servo amplifier to apply the new values.</p> <p>When " __ x _" bit 3 of Pr. PT29 is off, the interrupt positioning is started at rising of the MSD. When " __ x _" bit 3 of Pr. PT29 is on, the interrupt positioning is started at falling of the MSD.</p>	Device		DI1H	DI2H	DI3H	DI4H	DI5H	DI6H	CN1 connector pin No.		15	16	17	18	19	41	Setting parameter		PD04	PD06	PD08	PD10	PD12	PD14	Settable/Not settable	MR-JEA	○	×	×	×	○	○		MR-J4A	○	○	○	○	○	○	Device		DI7H	DI8H	DI9H	DI10H	DI11H	DI12H	CN1 connector pin No.		42	43	44	45	10	35	Setting parameter		PD16	PD18	PD20	PD22	PD44	PD46	Settable/Not settable	MR-JEA	○	○	○	×	○	○		MR-J4A	○	○	○	○	○	○
Device		DI1H	DI2H	DI3H	DI4H	DI5H	DI6H																																																																										
CN1 connector pin No.		15	16	17	18	19	41																																																																										
Setting parameter		PD04	PD06	PD08	PD10	PD12	PD14																																																																										
Settable/Not settable	MR-JEA	○	×	×	×	○	○																																																																										
	MR-J4A	○	○	○	○	○	○																																																																										
Device		DI7H	DI8H	DI9H	DI10H	DI11H	DI12H																																																																										
CN1 connector pin No.		42	43	44	45	10	35																																																																										
Setting parameter		PD16	PD18	PD20	PD22	PD44	PD46																																																																										
Settable/Not settable	MR-JEA	○	○	○	×	○	○																																																																										
	MR-J4A	○	○	○	○	○	○																																																																										

Item	Description
FB compilation method	Macro type
Restrictions or precautions	<p>1) This FB can be used only when the positioning mode is selected in the basic parameter PA01 (*STY) of the servo amplifier.</p> <p>2) The interrupt positioning function at mark detection and the current position latch function are mutually exclusive. When using the interrupt positioning function in this FB, do not use 2.9. M_FX5UCPU_MBSV_SetMarkDetect (Current position data latch at mark detection).</p> <p>3) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.</p>
FB operation	Always executed
Timing chart of I/O signals	<p>【Case of successful termination】</p> <p>【Case of error termination】</p>

Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
107h	i_dWindowUpperLimit (window upper limit) or i_dWindowLowerLimit (window lower limit) setting is out of range.	Try after checking the setting.
108h	i_udPositTravelDist (interrupted positioning amount of movement data) setting is out of range	Try after checking the setting.
10Ah	Parameter other than 00ABh is set in PrPA19,	Try after checking the setting.
111h	Modbus communication retry count i_uRetryCount (rety count number) exceeded the set number.	Try after checking the setting. Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.12. M_FX5UCPU_MBSV_SetCam (Simple cam control data setting)

Name

M_FX5UCPU_MBSV_SetCam

FB details

Item	Description																								
Function overview	Sets the cam number, cam stroke amount, and cam axis one-cycle length of the simple cam.																								
Symbol	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">M_FX5UCPU_MBSV_SetCam</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td>Execution status</td> </tr> <tr> <td>Station No.</td> <td>UW: i_uStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Cam No.</td> <td>UW: i_uCamNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Cam stroke amount</td> <td>D: i_dCamStroke</td> <td>o_uErrId :UW</td> <td>Error code</td> </tr> <tr> <td>Cam axis length per cycle</td> <td>UD: i_udCamLenghPerCycle</td> <td></td> <td></td> </tr> <tr> <td>Retry count No.</td> <td>UW: i_uRetryCount</td> <td></td> <td></td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Cam No.	UW: i_uCamNo	o_bErr :B	Error completion	Cam stroke amount	D: i_dCamStroke	o_uErrId :UW	Error code	Cam axis length per cycle	UD: i_udCamLenghPerCycle			Retry count No.	UW: i_uRetryCount		
Execution command	B: i_bEN	o_bENO :B	Execution status																						
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion																						
Cam No.	UW: i_uCamNo	o_bErr :B	Error completion																						
Cam stroke amount	D: i_dCamStroke	o_uErrId :UW	Error code																						
Cam axis length per cycle	UD: i_udCamLenghPerCycle																								
Retry count No.	UW: i_uRetryCount																								

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Cam No.	i_uCamNo	Word [unsigned]	0 to 8	Specify the cam number to use. When 0 has been set, the linear cam is performed in which the stroke ratio reaches 100% with the cam axis one-cycle length. The cam axis one-cycle length and cam stroke amount use the value set to the cam No. 1. Data is imported when the cam control command (CAMC) is turned on. If over 9 is set to i_uCamNo, 0 is automatically set to i_uCamNo. In case of setting unregistered CAM No, FB is normally finished, but AL_F6.3 (Cam unregistered error) will be observed in Servo amplifier when cam control command(CAMC) is turned on.

Name (comment)	Label name	Data type	Setting range	Description
Cam stroke amount	i_dCamStroke	Double word [signed]	-999999 to 999999 × 10 ^{STM} μm × 10 ^(STM-4) inch pulse -360000 to 360000 × 10 ⁻³ degree *1	For the stroke ratio data format cam, specify the cam stroke amount corresponding to the stroke ratio of 100% in units of output-axis positions. For the coordinate data format cam, this setting is ignored. Data is imported when the cam control is started (CAMC is turned on). If out of range is set to i_dCamStroke, FB is normally finished, but AL_F6.4 (Cam control data setting range error) will be observed in Servo amplifier.
Cam axis one-cycle length	i_udCamLenghPerCycle	Double word [unsigned]	1 to 999999 × 10 ^{STM} μm × 10 ^(STM-4) inch pulse 0 to 360000 × 10 ⁻³ degree *1	Specify the input amount required for the one cycle of a cam. Data is imported when the cam control is started (CAMC is turned on). If out of range is set to i_dCamStroke, FB is normally finished, but AL_F6.4 (Cam control data setting range error) will be observed in Servo amplifier.
Retry count	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

*1 STM(Feed length multiplication)

This function is available when point table mode or program mode.

This function is disabled when the position data unit of "degree" or "pulse".

●Output labels

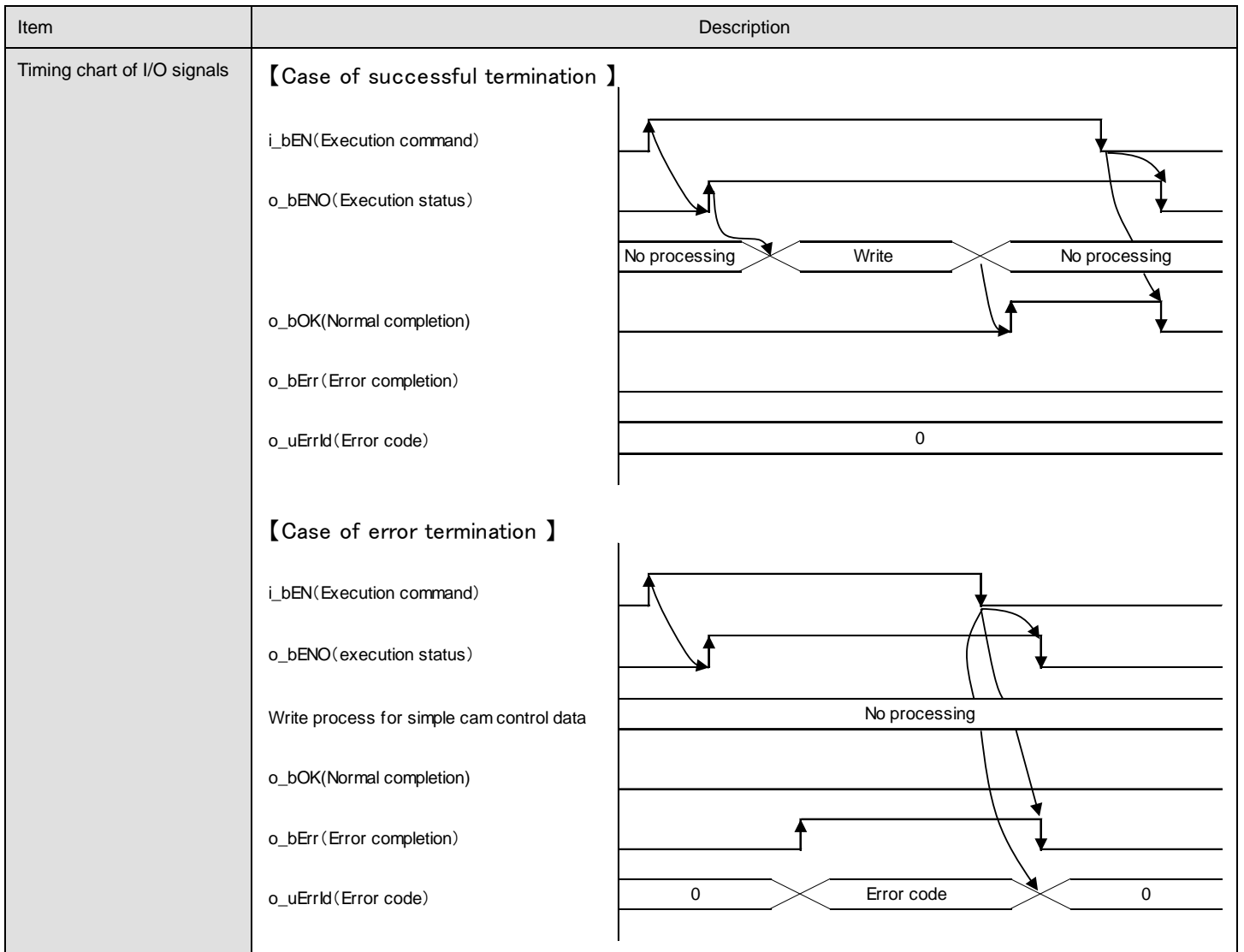
Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that the simple cam control data setting has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.

Name (comment)	Label name	Data type	Initial value	Description
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	200 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), simple cam control data is written to the servo amplifier. (Set cam data using MR Configurator2 in advance.) 2) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 3) For details, refer to the list of error codes. 4) Set Pr.PT35 (simple Cam function selection) by MR Configurator2 or M_FX5UCPU_MBSV_SetSVParmData (Servo parameter data setting) before using simple Cam function. Pr.PT35 can be used after resetting. 5) When it is set Cam No by this FB, 0 is set to simple Cam control data No49 Cam No (CNO) before using this FB. 6) When the cam control command (CAMC: bit 5 of the register 2D02h) is turned on, the normal positioning control is switched to the cam control. 7) While the cam control is being performed (bit 5 of 2D12h: S_CAMS cam control being performed is "1"), the cam number being controlled can be read using the function code "03h" (Read holding registers).
FB compilation method	Macro type
Restrictions or precautions	1) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
111h	Modbus communication rety count exceeded the number set in i_uRetryCount.	Try after checking the setting. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.13. M_FX5UCPU_MBSV_Teaching (Teaching)

Name

M_FX5UCPU_MBSV_Teaching

FB details

Item	Description																
Function overview	Stores the current position in the position data of a specified positioning point table number.																
Symbol	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">M_FX5UCPU_MBSV_Teaching</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td>Station No.</td> <td>UW: i_uStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Point table No.</td> <td>UW: i_uPointNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Retry count</td> <td>UW: i_uRetryCount</td> <td>o_uErrId :UW</td> <td>Error code</td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Point table No.	UW: i_uPointNo	o_bErr :B	Error completion	Retry count	UW: i_uRetryCount	o_uErrId :UW	Error code
Execution command	B: i_bEN	o_bENO :B	Execution status														
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion														
Point table No.	UW: i_uPointNo	o_bErr :B	Error completion														
Retry count	UW: i_uRetryCount	o_uErrId :UW	Error code														

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Point table No.	i_uPointNo	Word [unsigned]	For MR-JE-A: 1 to 31 For MR-J4-A: 1 to 255	Specify the point table number to set.
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr ((error complete) is turned on, and interrupt processing FB. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that the data setting of the current position to the point table position data has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	547 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the current position is stored in the position data having the positioning point table number of a specified station number. 2) Teaching can be operated by this FB, after moving to target position by JOG function or external auxiliary pulse generator. 3) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 4) If the setting value of the point table No. 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 103h is stored in o_uErrId (Error code). 5) Teaching function can be used only in case of absolute system. When 1h(incremental) is set to Selection of Position command method(PT01)"__x", FB process is interrupted and Error code 109h is set to o_uErrId. 6) FB process is interrupted when FB is operated in case that present positioning data is out of range in Point table Position data. And Error code 10Dh is set to o_uErrId. 7) For details, refer to the list of error codes.
FB compilation method	Macro type

Item	Description
Restrictions or precautions	1) When you use this FB, set the controlword(6060h) to the point table mode(-101). If you run this FB in the program mode, the program data may get corrupted. 2) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)
Timing chart of I/O signals	<p>【Case of successful termination】</p> <p>【Case of error termination】</p>

Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
103h	The set value of i_uPointNo (Point table No.) is out of the setting range.	Try again after checking the setting.
109h	Selection of Positioning command method(Pr.PT01) is not Absolution position command	Try after checking the setting.
10Ah	Pr.PA19 is not 00ABh.	Try after checking the setting.
10Dh	Point table data is out of range	Try after change present positioning data within Point table position data.
111h	Modbus communication rety count exceeded the number set in i_uRetryCount.	Try after checking the setting. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.14. M_FX5UCPU_MBSV_ReadPointTableData (Point table data read processing)

Name

M_FX5UCPU_MBSV_ReadPointTableData

FB details

Item	Description																														
Function overview	Reads positioning point table data.																														
Symbol	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="text-align: center;">M_FX5UCPU_MBSV_ReadPointTableData</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td>Station No.</td> <td>UW: i_uStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Point table No.</td> <td>UW: i_uPointNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Retry count</td> <td>UW: i_uRetryCount</td> <td>o_uErrld :UW</td> <td>Error code</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">pb_dPositAdr</td> <td>Positioning data</td> </tr> <tr> <td>pb_uCommandSpeed</td> <td>Speed data</td> </tr> <tr> <td>pb_uAccTime</td> <td>Acceleration time constant</td> </tr> <tr> <td>pb_uDecTime</td> <td>Deceleration time constant</td> </tr> <tr> <td>pb_uDwellTime</td> <td>Dwell</td> </tr> <tr> <td>pb_uSubFunction</td> <td>Sub function</td> </tr> <tr> <td>pb_uMCode</td> <td>M code</td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Point table No.	UW: i_uPointNo	o_bErr :B	Error completion	Retry count	UW: i_uRetryCount	o_uErrld :UW	Error code	pb_dPositAdr	Positioning data	pb_uCommandSpeed	Speed data	pb_uAccTime	Acceleration time constant	pb_uDecTime	Deceleration time constant	pb_uDwellTime	Dwell	pb_uSubFunction	Sub function	pb_uMCode	M code
Execution command	B: i_bEN	o_bENO :B	Execution status																												
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion																												
Point table No.	UW: i_uPointNo	o_bErr :B	Error completion																												
Retry count	UW: i_uRetryCount	o_uErrld :UW	Error code																												
pb_dPositAdr	Positioning data																														
pb_uCommandSpeed	Speed data																														
pb_uAccTime	Acceleration time constant																														
pb_uDecTime	Deceleration time constant																														
pb_uDwellTime	Dwell																														
pb_uSubFunction	Sub function																														
pb_uMCode	M code																														

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Point table No.	i_uPointNo	Word [unsigned]	For MR-JE-A: 1 to 31 For MR-J4-A: 1 to 255	Specify the point table number to be read.
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt FB processing. Then, error code 111h is stored into o_uErrld (error code). 0 setting is same as 1.

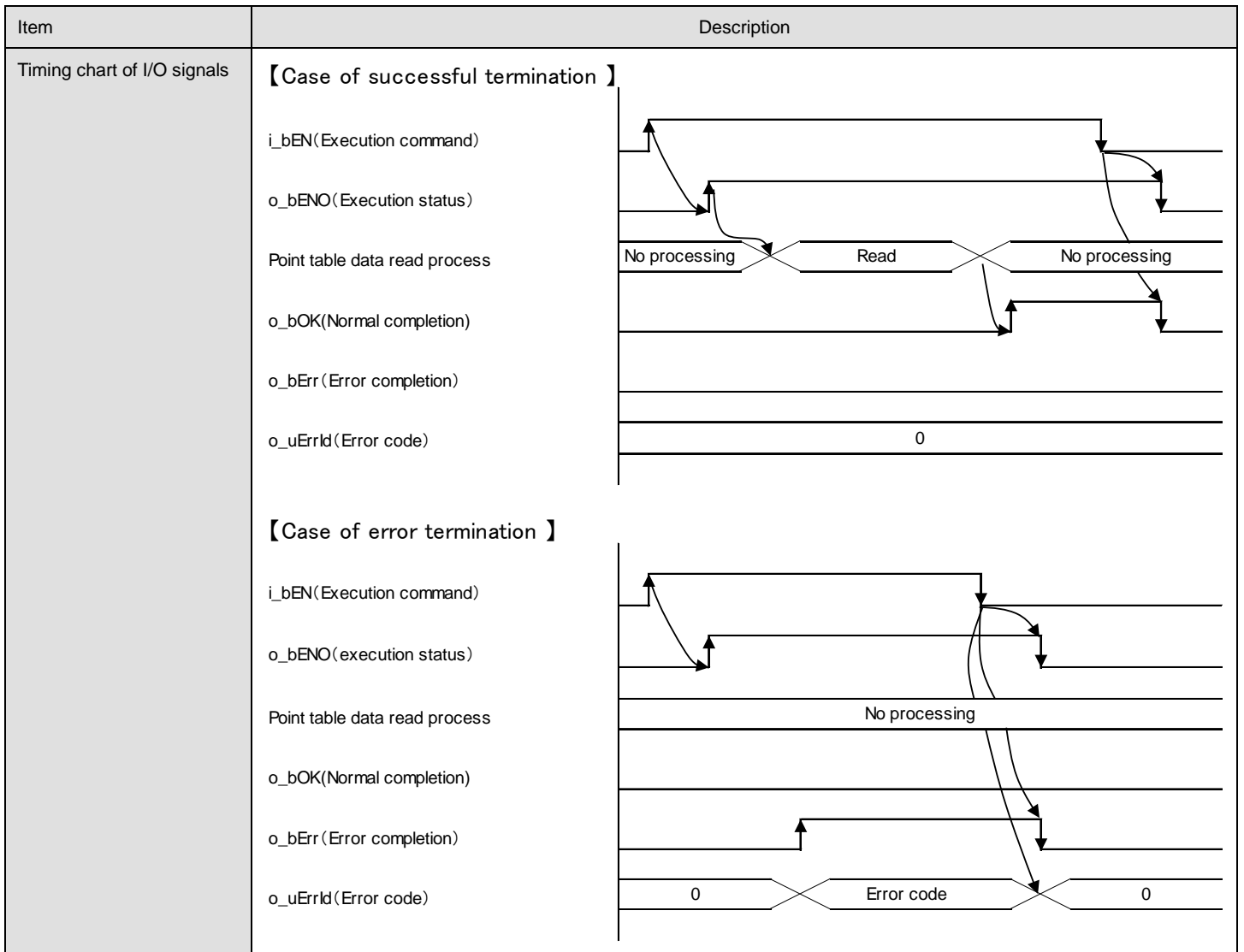
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that reading positioning point table data has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.

●Disclosed labels

Name (comment)	Label name	Data type	Initial value	Description
Position data	pb_dPositAddr	Double word [signed]	0	When using point tables under the absolute value command method, the target address (absolute value) is read. When using point tables under the incremental value command method, the travel distance is read.
Speed data	pb_uCommandSpeed	Word [unsigned]	0	The command speed of the servo motor at the execution of the positioning is read.
Acceleration time constant	pb_uAccTime	Word [unsigned]	0	Time setting for the servo motor to reach rated speed is read.
Deceleration time constant	pb_uDecTime	Word [unsigned]	0	Time setting for the servo motor to stop from rated speed is read.
Dwell	pb_uDwellTime	Word [unsigned]	0	The dwell time is read.
Sub function	pb_uSubFunction	Word [unsigned]	0	The sub function is read.
M code	pb_uMCode	Word [unsigned]	0	An M code is read.

Item	Description
Language	Ladder diagram
Number of steps	325 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the set point table data is read from the servo amplifier. 2) To use an M code, set " _ _ x _ " of Function selection O-3 (Pr. PO12) to 1h using MR Configurator2 or M_FX5UCPU_MBSV_SetSVParamData (Servo parameter data setting) in advance. <u>To change this servo amplifier setting, configure the setting and power off and on the servo amplifier to apply the new values.</u> M code of MR-JE-A will be compatible soon. 3) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 4) If the setting value of the point table No. 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 103h is stored in o_uErrId (Error code). 5) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	<ol style="list-style-type: none"> 1) If you run the FB in the program mode, undefined data is read out. 2) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)



Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
103h	The set value of i_uPointNo (Point table No.) is out of the setting range.	Try again after checking the setting.
111h	Modbus communication retry count i_uRetryCount (rety count number) exceeded the number set.	After checking the setting of FB. Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.15. M_FX5UCPU_MBSV_ReadSVParamData (Servo parameter data read processing)

Name

M_FX5UCPU_MBSV_ReadSVParamData

FB details

Item	Description																				
Function overview	Reads servo parameter data.																				
Symbol	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center; margin: 0;">M_FX5UCPU_MBSV_ReadSVParamData</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 2px;">Execution command</td> <td style="width: 30%; padding: 2px;">B: i_bEN</td> <td style="width: 30%; padding: 2px;">o_bENO :B</td> <td style="padding: 2px;">Execution status</td> </tr> <tr> <td style="padding: 2px;">Station No.</td> <td style="padding: 2px;">UW: i_uStationNo</td> <td style="padding: 2px;">o_bOK :B</td> <td style="padding: 2px;">Normal completion</td> </tr> <tr> <td style="padding: 2px;">Parameter group</td> <td style="padding: 2px;">UW: i_uSVPRM_Grp</td> <td style="padding: 2px;">o_bErr :B</td> <td style="padding: 2px;">Error completion</td> </tr> <tr> <td style="padding: 2px;">Parameter No.</td> <td style="padding: 2px;">UW: i_uSVPRM_No</td> <td style="padding: 2px;">o_uErrId :UW</td> <td style="padding: 2px;">Error code</td> </tr> <tr> <td style="padding: 2px;">Retry count No.</td> <td style="padding: 2px;">UW: i_uRetryCount</td> <td style="padding: 2px;">i_dSVPRM_Data :D</td> <td style="padding: 2px;">Parameter data</td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Parameter group	UW: i_uSVPRM_Grp	o_bErr :B	Error completion	Parameter No.	UW: i_uSVPRM_No	o_uErrId :UW	Error code	Retry count No.	UW: i_uRetryCount	i_dSVPRM_Data :D	Parameter data
Execution command	B: i_bEN	o_bENO :B	Execution status																		
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion																		
Parameter group	UW: i_uSVPRM_Grp	o_bErr :B	Error completion																		
Parameter No.	UW: i_uSVPRM_No	o_uErrId :UW	Error code																		
Retry count No.	UW: i_uRetryCount	i_dSVPRM_Data :D	Parameter data																		

Labels

● Input labels

Name (comment)	Label name	Data type	Setting range	Description																																												
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.																																												
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.																																												
Parameter group	i_uSVPRM_Grp	Word [unsigned]	H2000, H2080, H2100, H2180, H2200, H2280, H2300, H2380, H2400, H2480	Specify the parameter group whose data is to be read. <table border="1" style="margin: 10px auto; width: 80%;"> <thead> <tr> <th>Setting value</th> <th>Parameter group</th> <th>MR-JE-A</th> <th>MR-J4-A</th> </tr> </thead> <tbody> <tr><td>H 2000</td><td>PA group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2080</td><td>PB group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2100</td><td>PC group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2180</td><td>PD group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2200</td><td>PE group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2280</td><td>PF group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> <tr><td>H 2300</td><td>PO group</td><td style="text-align: center;">×</td><td style="text-align: center;">○</td></tr> <tr><td>H 2380</td><td>PS group</td><td style="text-align: center;">×</td><td style="text-align: center;">○</td></tr> <tr><td>H 2400</td><td>PL group</td><td style="text-align: center;">×</td><td style="text-align: center;">○</td></tr> <tr><td>H 2480</td><td>PT group</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr> </tbody> </table>	Setting value	Parameter group	MR-JE-A	MR-J4-A	H 2000	PA group	○	○	H 2080	PB group	○	○	H 2100	PC group	○	○	H 2180	PD group	○	○	H 2200	PE group	○	○	H 2280	PF group	○	○	H 2300	PO group	×	○	H 2380	PS group	×	○	H 2400	PL group	×	○	H 2480	PT group	○	○
Setting value	Parameter group	MR-JE-A	MR-J4-A																																													
H 2000	PA group	○	○																																													
H 2080	PB group	○	○																																													
H 2100	PC group	○	○																																													
H 2180	PD group	○	○																																													
H 2200	PE group	○	○																																													
H 2280	PF group	○	○																																													
H 2300	PO group	×	○																																													
H 2380	PS group	×	○																																													
H 2400	PL group	×	○																																													
H 2480	PT group	○	○																																													
Parameter No.	i_uSVPRM_No	Word [unsigned]	1 to 80 (decimal)	Specify the servo parameter number.																																												

Name (comment)	Label name	Data type	Setting range	Description
Retry count	i_uRetryCount	Word [unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt FB processing. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

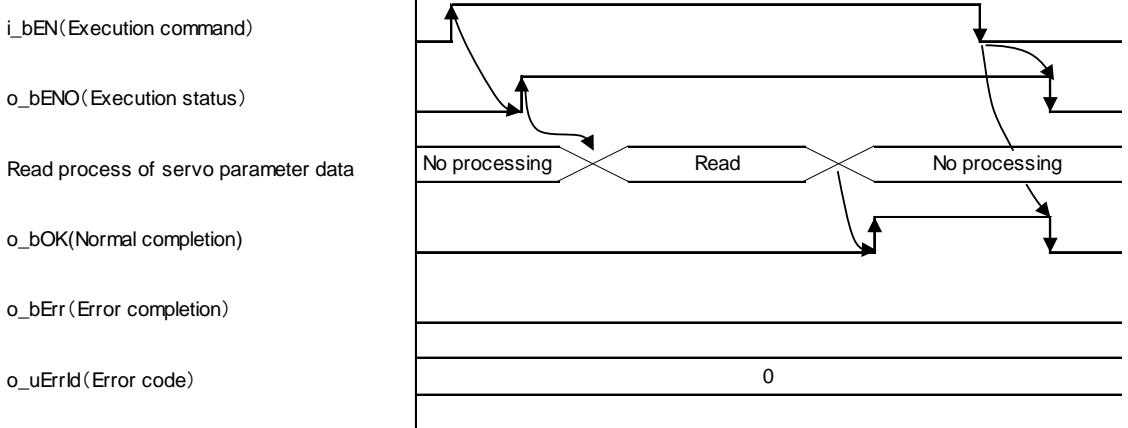
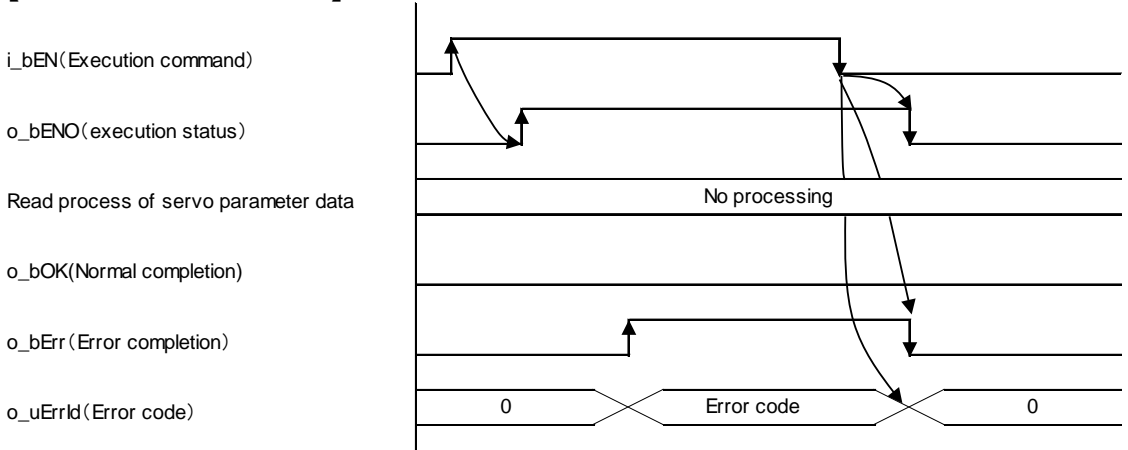
●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that servo parameter data reading has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.
Parameter data	o_dSVPRM_Data	Double word [signed]	0	The values in the servo parameter whose data is to be read are stored.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	545 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), data in the set servo parameter is read. 2) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 3) If the setting value of the parameter group or parameter 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 101h is stored in o_uErrId (Error code). 4) For details, refer to the list of error codes.
FB compilation method	Macro type

Item	Description
Restrictions or precautions	<p>1) According to the setting of Pr. PA19 (Parameter writing inhibit), the range of parameters to be read by this FB is limited. Set Pr. PA19 as necessary using M_FX5UCPU_MBSV_SetSVPParamData (Servo parameter data setting). For the setting values, refer to the instruction manual of the servo amplifier used.</p> <p>2) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.</p>
FB operation	Pulsed execution (multiple scan execution type)
Timing chart of I/O signals	<p>【Case of successful termination】</p>  <p>【Case of error termination】</p> 

Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
101h	The set value of i_uSVPRM_Grp (Parameter group) or i_uSVPRM_No (Parameter No.) is out of the setting range.	Try again after checking the setting.
10Ah	Pr.PA19 is not 00ABh.	Try again after checking the setting.
111h	Modbus communication retry count i_uRetryCount (rety count number) exceeded the number set.	Retry after checking the setting of FB. Retry after eliminating factor of Modbus communication error

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition

2.16. M_FX5UCPU_MBSV_ReadALMHistory (Alarm history read processing)

Name

M_FX5UCPU_MBSV_ReadALMHistory

FB details

Item	Description																								
Function overview	Reads the alarm history.																								
Symbol	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">M_FX5UCPU_MBSV_ReadALMHistory</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B: i_bEN</td> <td style="width: 30%;">o_bENO :B</td> <td>Execution status</td> </tr> <tr> <td>Station No.</td> <td>UW: i_uStationNo</td> <td>o_bOK :B</td> <td>Normal completion</td> </tr> <tr> <td>Assigning Alarm history No.</td> <td>UW: i_uErrHistoryNo</td> <td>o_bErr :B</td> <td>Error completion</td> </tr> <tr> <td>Retry count</td> <td>UW: i_uRetryCount</td> <td>o_uErrId :UW</td> <td>Error code</td> </tr> <tr> <td></td> <td></td> <td>o_ud16ErrNoHistory :UD</td> <td>History of alarm No.</td> </tr> <tr> <td></td> <td></td> <td>o_ud16ErrTimeHistory :UD</td> <td>History of alarm time</td> </tr> </table> </div>	Execution command	B: i_bEN	o_bENO :B	Execution status	Station No.	UW: i_uStationNo	o_bOK :B	Normal completion	Assigning Alarm history No.	UW: i_uErrHistoryNo	o_bErr :B	Error completion	Retry count	UW: i_uRetryCount	o_uErrId :UW	Error code			o_ud16ErrNoHistory :UD	History of alarm No.			o_ud16ErrTimeHistory :UD	History of alarm time
Execution command	B: i_bEN	o_bENO :B	Execution status																						
Station No.	UW: i_uStationNo	o_bOK :B	Normal completion																						
Assigning Alarm history No.	UW: i_uErrHistoryNo	o_bErr :B	Error completion																						
Retry count	UW: i_uRetryCount	o_uErrId :UW	Error code																						
		o_ud16ErrNoHistory :UD	History of alarm No.																						
		o_ud16ErrTimeHistory :UD	History of alarm time																						

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	i_bEN	Bit	On or off	On: The FB is activated. Off: The FB is not activated.
Station No.	i_uStationNo	Word [unsigned]	1 to 32	Specify the slave station number.
Alarm history count specification	i_uErrHistoryNo	Word [unsigned]	1 to 16	Specify the number of alarms from the latest alarm to be read. Up to 16 alarms (from the latest one to the 15th alarms before the latest one) can be read. If 0 is set to i_uErrHistoryNo, the latest alarm information is read. If over 16 is set, only 16 alarm information are read.
Retry count	i_uRetryCount	Word[unsigned]	0~65535	Modbus-RTU communication error count number is set in retry count. If Modbus-RTU communication error occurs more than the set number, o_bErr (error complete) is turned on, and interrupt FB processing. Then, error code 111h is stored into o_uErrId (error code). 0 setting is same as 1.

●Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	o_bENO	Bit	Off	On: Execution command is on. Off: Execution command is off.
Normal completion	o_bOK	Bit	Off	When this label is on, it indicates that reading of the alarm history has been completed. However, this label does not turn on if a module error has occurred at the start.
Error completion	o_bErr	Bit	Off	When this label is on, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The error code generated in the FB is output.
Alarm number history	o_ud16ErrNoHistory	Double word [unsigned] (0..15)	0	Alarm numbers for the number of alarms in the alarm history specified in i_uErrHistoryNo (Alarm history count specification) are output. Up to 16 alarms are output. To specify the numbers using labels, use Array for the data type. If the number of alarms is smaller than the value set in i_uErrHistoryNo (Alarm history count specification), 0 is output. xxxxyyyyh: xxxxh: Alarm No. (0 to FFh) yyyyh: Alarm details (0 to Fh)
Alarm occurrence time history	o_ud16ErrTimeHistory	Double word [unsigned] (0..15)	0	The occurrence time [hour] of an alarm in the alarm history is output for the number of alarms specified in i_uErrHistoryNo (Alarm history count specification). The occurrence time of an alarm is the cumulative energization time when the alarm occurred. Up to 16 alarms are output. To specify the numbers using labels, use Array for the data type. If the number of alarms is smaller than the value set in i_uErrHistoryNo (Alarm history count specification), 0 is output.

●Disclosed labels

Name (comment)	Label name	Data type	Setting range	Description
None	None	None	None	None

Item	Description
Language	Ladder diagram
Number of steps	714 Step * The number of steps of the FB in a program depends on the CPU model used and input and output definition.
FB dependency relation	No dependency relation
Processing	<ol style="list-style-type: none"> 1) By turning on i_bEN (Execution command), the alarms for the specified number in the alarm history are read from the servo amplifier. 2) If the setting value of the station 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 100h is stored in o_uErrId (Error code). 3) For details, refer to the list of error codes.
FB compilation method	Macro type
Restrictions or precautions	1) Refer to 1.3. Applicable Hardware and Software, and Restrictions or Precautions as well.
FB operation	Pulsed execution (multiple scan execution type)
Timing chart of I/O signals	<p>【Case of successful termination】</p> <p>【Case of error termination】</p>

Error code

●List of error codes

Error code	Description	Action
100h	The set value of i_uStationNo (Station No.) is out of the setting range. The target station is not within the range of 1 to 32.	Try again after checking the setting.
111h	Modbus communication rety count exceeded the number set in i_uRetryCount.	Try after checking the setting. Retry after eliminating factor of Modbus communication error.

FB version upgrade history

Version	Date	Description
1.00A	August, 2015	First edition