MITSUBISHI ELECTRIC

PROGRAMMABLE CONTROLLERS

MELSEC iQ-F series

MELSEC iQ-F FX5
Simple Motion Module Function Block Reference

CONTENTS

1 List of FBs

This FB list is for using the MELSEC iQ-F Simple Motion module FX5-40SSC-S.

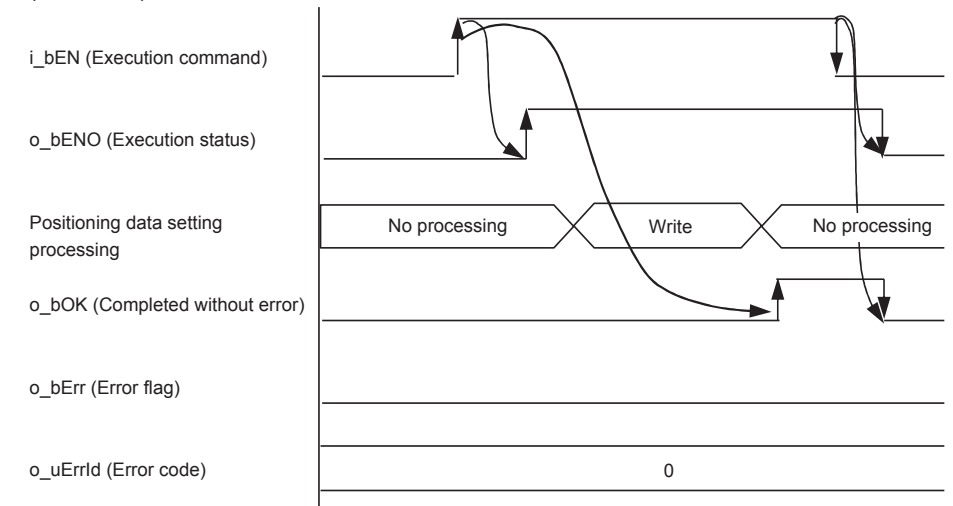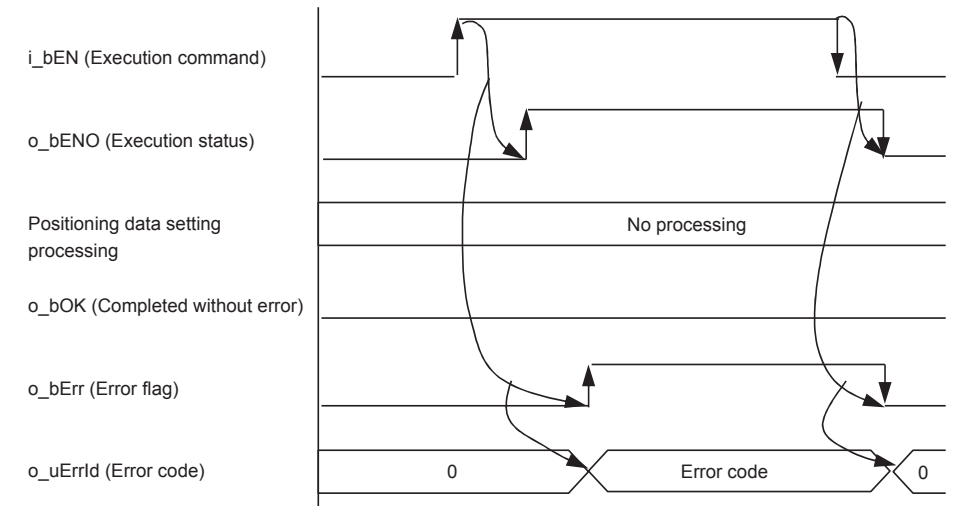| Name	Description
M+FX5SSC_SetPositioningData	Sets positioning data (Da.1 to Da.4, Da.6 to Da.10, Da.20 to Da.22).
M+FX5SSC_StartPositioning	Starts the positioning operation.
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M+FX5SSC_MPG	Performs the manual pulse generator operation.
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M+FX5SSC_ChangePosition	Changes the target position.
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M+FX5SSC_ ChangeServoParameter	Changes the servo parameter after the servo amplifier is activated.
M+FX5SSC_ ChangeTorqueControlMode	Activates the torque control mode.
M+FX5SSC_ ChangeSpeedControlMode	Activates the speed control mode.
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M+FX5SSC_Sync	Starts and ends the synchronous control.
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M+FX5SSC_DisableSyncEncoder	Disables inputs from the synchronous encoder axis.
M+FX5SSC_EnableSyncEncoder	Enables inputs from the synchronous encoder axis.
M+FX5SSC_ResetSyncEncoderError	Reads error information from the synchronous encoder axis, and resets the error.
M+FX5SSC_ConnectSyncEncoder	Connects a synchronous encoder via CPU.
M+FX5SSC_MoveCamReferencePosition	Adds the movement amount set in the synchronous control change value to the cam reference position to move the cam reference position.
M+FX5SSC_ChangeCamPositionPerCycle	Changes the cam axis current value per cycle to a synchronous control change value.
M+FX5SSC_ChangeMainShaftGearPositionPerCycle	Changes the current value per cycle after main shaft gear to a synchronous control change value.
M+FX5SSC_ChangeAuxiliaryShaftGearPositionPerCycle	Changes the current value per cycle after auxiliary shaft gear to a synchronous control change value.
M+FX5SSC_MoveCamPositionPerCycle	Adds the movement amount set in the synchronous control change value to a cam axis current value per cycle to move the cam axis current value per cycle.
M+FX5SSC_MakeRotaryCutterCam	Automatically generates the cam for a rotary cutter.
M+FX5SSC_CalcCamCommandPosition	Calculates a cam axis feed current value, and outputs the calculation result.
M+FX5SSC_CalcCamPositionPerCycle	Calculates a cam axis current value per cycle, and outputs the calculation result.

2 Simple Motion Module FB

2.1 M+FX5SSC_SetPositioningData

Name

M+FX5SSC_SetPositioningData

Function overview

Item	Description
Function overview	Sets positioning data (Da.1 to Da.4, Da.6 to Da.10, Da.20 to Da.22).
Symbol	 M+FX5SSC_SetPositioningData Execution command —— B : i_bEN　　　　　o_bENO : B —— Execution status Module label —— DUT : i_stModule　　　o_bOK : B —— Completed without error Target axis —— UW : i_uAxis　　　　　o_bErr : B —— Error flag Positioning data No. —— UW : i_uDataNo　　　o_uErrId : UW —— Error code

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)

Programming language	Ladder
Number of steps (maximum)	311 steps
Function description	• By turning ON i_bEN (Execution command), the set positioning data is written to the buffer memory. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When the setting value of the positioning data No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 101 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (single scan execution type)

Item	Description
Timing chart	When operation completes without an error

When operation completes without an error:

- i_bEN (Execution command)
- o_bENO (Execution status)
- Positioning data setting processing: No processing / Write / No processing
- o_bOK (Completed without error)
- o_bErr (Error flag)
- o_uErrId (Error code): 0

When an error occurs:

- i_bEN (Execution command)
- o_bENO (Execution status)
- Positioning data setting processing: No processing
- o_bOK (Completed without error)
- o_bErr (Error flag)
- o_uErrId (Error code): 0 / Error code / 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.
101 (Hexadecimal)	The setting value of i_uDataNo (Positioning data No.) is out of the range. The positioning data No. is not within the range of 1 to 100.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Positioning data No.	i_uDataNo	Word [unsigned]	1 to 100	Specify the positioning data No.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that setting the positioning data has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

■Disclosed labels

Name	Variable name	Data type	Setting range	Description
Da.1: Operation pattern	pb_uOpePattern	Word [unsigned]	0: Positioning complete 1: Continuous positioning control 3: Continuous path control	Specify whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.
Da.2: Control method	pb_uCtrlSys	Word [unsigned]	01H: ABS Linear 1 02H: INC Linear 1 03H: Feed 1 04H: FWD V1 05H: RVS V1 06H: FWD V/P 07H: RVS V/P 08H: FWD P/V 09H: RVS P/V 0AH: ABS Linear 2 0BH: INC Linear 2 0CH: Feed 2 0DH: ABS ArcMP 0EH: INC ArcMP 0FH: ABS ArcRGT 10H: ABS ArcLFT 11H: INC ArcRGT 12H: INC ArcLFT 13H: FWD V2 14H: RVS V2 15H: ABS Linear 3 16H: INC Linear 3 17H: Feed 3 18H: FWD V3 19H: RVS V3 1AH: ABS Linear 4 1BH: INC Linear 4 1CH: Feed 4 1DH: FWD V4 1EH: RVS V4 80H: NOP 81H: Address CHG 82H: JUMP 83H: LOOP 84H: LEND	Sets the control system for positioning control.
Da.3: Acceleration time No.	pb_uAccTimeNo	Word [unsigned]	0: Acceleration time 0 1: Acceleration time 1 2: Acceleration time 2 3: Acceleration time 3	Set any of the acceleration time 0 to 3 as the acceleration time for positioning.
Da.4: Deceleration time No.	pb_uDecTimeNo	Word [unsigned]	0: Deceleration time 0 1: Deceleration time 1 2: Deceleration time 2 3: Deceleration time 3	Set any of the deceleration time 0 to 3 as the deceleration time for positioning.
Da.20: Axis to be interpolated No.1	pb_uInterpolatedAxNo1	Word [unsigned]	0H: Axis 1 selected 1H: Axis 2 selected 2H: Axis 3 selected 3H: Axis 4 selected	Set the axis to be interpolated (interpolation axis) to execute the 2- to 4-axis interpolation operation.
Da.21: Axis to be interpolated No.2	pb_uInterpolatedAxNo2	Word [unsigned]	0H: Axis 1 selected 1H: Axis 2 selected 2H: Axis 3 selected 3H: Axis 4 selected	Set the axis to be interpolated (interpolation axis) to execute the 3- and 4-axis interpolation operation.
Da.22: Axis to be interpolated No.3	pb_uInterpolatedAxNo3	Word [unsigned]	0H: Axis 1 selected 1H: Axis 2 selected 2H: Axis 3 selected 3H: Axis 4 selected	Set the axis to be interpolated (interpolation axis) to execute the 4-axis interpolation operation.
Da.10: M code	pb_uMcode	Word [unsigned]	Da.2: Control method = 82H: JUMP instruction • 0 to 10 Da.2: Control method = 83H: LOOP • 1 to 65535 Da.2: Control method = Other than the above • 0 to 65535	Set an "M code", a "condition data No.", or the "Number of LOOP to LEND repetitions" corresponding to the "Da.2: Control method".

Name	Variable name	Data type	Setting range	Description
Da.9: Dwell time	pb_uDwellTime	Word [unsigned]	Da.2: Control method = 82H: JUMP instruction • 1 to 600 Da.2: Control method = 82H: Other than JUMP instruction • 0 to 65535	Set the "dwell time" or "positioning data No." corresponding to the "Da.2: Control method".
Da.8: Command speed	pb_udCmdSpd	Double word [signed]	Pr.1: Unit setting = 0, 1, 2 • 1 to 2000000000 Pr.1: Unit setting = 3 • 1 to 1000000000	Set the command speed for positioning.
			FFFFFFFFH: Current speed (Speed set for the previous positioning data No.)	
Da.6: Positioning address	pb_dPositAdr	Double word [signed]	Pr.1: Unit setting = 0, 1, 3 • Da.2: Control method = 06H to 09H: 0 to 2147483647 • Da.2: Control method = Other than 06H to 09H:-2147483648 to 2147483647 Pr.1: Unit setting = 2 • Da.2: Control method = 01H, 0AH, 15H, 1AH, 81H, 20H, 22H, 23H: 0 to 35999999 • Da.2: Control method = 02H, 0BH, 16H, 1BH, 03H, 0CH, 17H, 1CH, 20H, 22H, 23H: -2147483648 to 2147483647 • Da.2: Control method = 06H, 07H: 0 to 2147483647 (INC mode), 0 to 35999999 (ABS mode) • Da.2: Control method = 08H, 09H: 0 to 2147483647	Set the address to be used as the target value for positioning control.
Da.7: Arc address	pb_dArcAdr	Double word [signed]	-2147483648 to 2147483647	This data is required only when performing circular interpolation control.

Version upgrade history

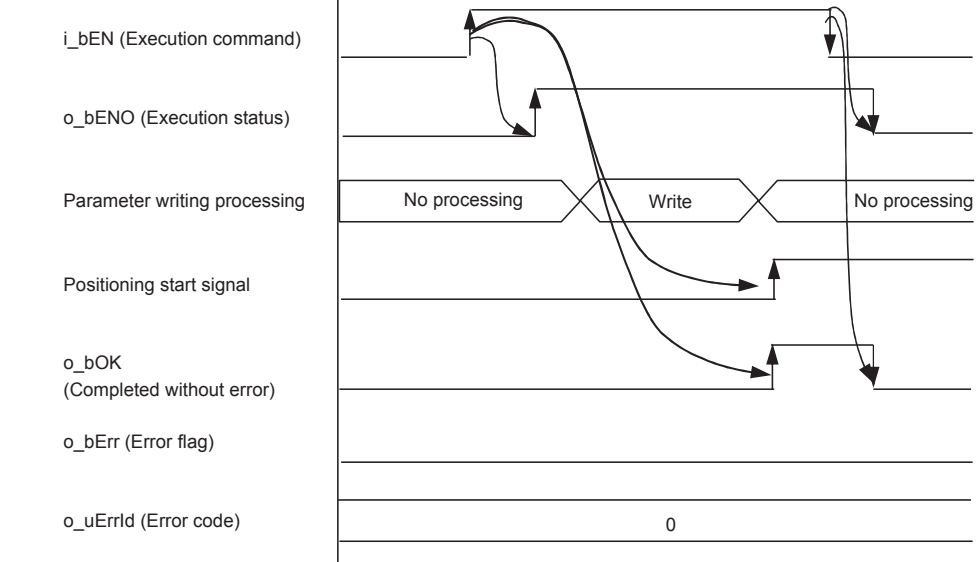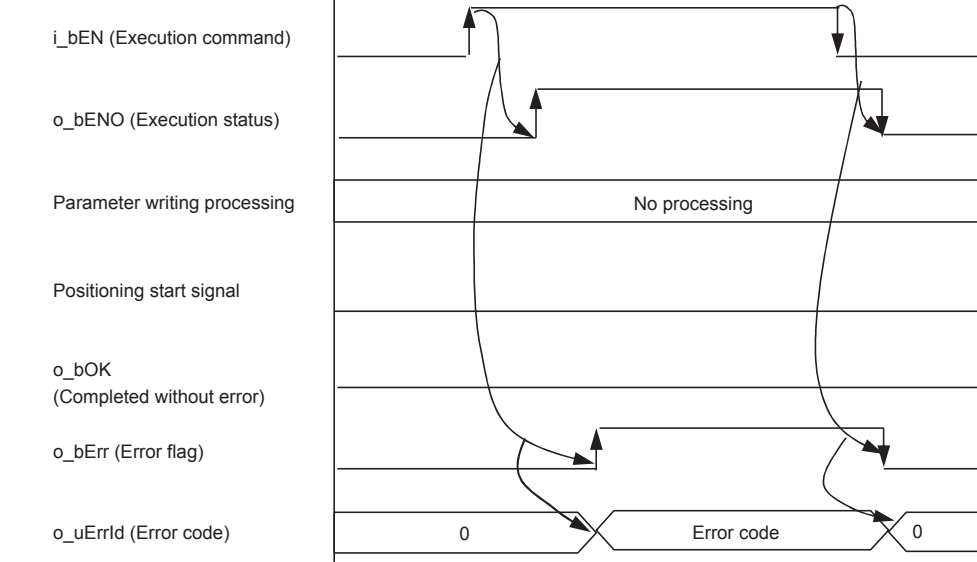| Version	Date	Description
1.00A	2015/04/23	First edition

2.2 M+FX5SSC_StartPositioning

Name

M+FX5SSC_StartPositioning

Function overview

Item	Description
Function overview	Starts the positioning operation.
Symbol	

M+FX5SSC_StartPositioning

Execution command ——	B : i_bEN	o_bENO : B	—— Execution status
Module label ——	DUT : i_stModule	o_bOK : B	—— Completed without error
Target axis ——	UW : i_uAxis	o_bErr : B	—— Error flag
Cd.3: Positioning start No. ——	UW : i_uStartNo	o_uErrId : UW	—— Error code

Item	Description	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	497 steps	
Function description	• By turning ON i_bEN (Execution command), the control corresponding to i_uStartNo (Cd.3: Positioning start No.) is started. • This FB is activated by turning ON the positioning start signal. • Only when the conditions are met, the positioning start signal is turned ON by turning ON i_bEN (Execution command). The conditions are the following: READY is ON, positioning start signal is OFF, start complete signal is OFF, and BUSY signal is OFF. If any of the conditions is not met, the error code 200 (hexadecimal) is stored in o_uErrId (Error code). • When the start complete signal is turned ON or i_bEN (Execution command) is turned OFF, the positioning start signal is turned OFF. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When the setting value of the positioning start No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 102 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Pulsed execution (multiple scan execution type)	

Item	Description
Timing chart	When operation completes without an error

i_bEN (Execution command)

o_bENO (Execution status)

Parameter writing processing

| No processing | Write | No processing |

Positioning start signal

o_bOK
(Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)

0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

Parameter writing processing

No processing

Positioning start signal

o_bOK
(Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)

| 0 | Error code | 0 |

| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
• The FB cannot be used in an interrupt program.
• Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF.
• This FB turns ON and OFF the positioning start signal. Thus, do not operate the positioning start signal by the other means while being executed.
• When this FB is used twice or more, create an interlock to prevent the FBs from being activated at the same time.
• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.
• This FB does not set the data when started. Data required for controlling the start No. must be set on the parameter or buffer memory.
• Every input must be provided with a value for proper FB operation. |

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.
102 (Hexadecimal)	The setting value of i_uStartNo (Cd.3: Positioning start No.) is out of the range. The positioning start No. is not within the range of 1 to 600, 7000 to 7004, and 9001 to 9004.	Please try again after confirming the setting.
200 (Hexadecimal)	The condition for positioning start is not met. Any of the following conditions is not met. • READY: On • Positioning start signal: Off • Start complete signal: Off • BUSY signal: Off	Execute the FB when all of the following conditions are met. • READY: On • Positioning start signal: Off • Start complete signal: Off • BUSY signal: Off

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.3: Positioning start No.	i_uStartNo	Word [unsigned]	1 to 600: Positioning data No. 7000 to 7004: Block start designation 9001: Machine home position return 9002: Fast-home position return 9003: Current value changing 9004: Simultaneous starting of multiple axes	Set the positioning start No. corresponding to the control to be started in Cd.3: Positioning start No.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that executing this FB has been completed. However, this label does not turn ON when a module error occurs at the start.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.3 M+FX5SSC_JOG

Name

M+FX5SSC_JOG

Function overview

Item	Description
Function overview	Performs the JOG operation or inching operation.
Symbol	

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	447 steps	
Function description	• By turning ON i_bFJog (Forward run JOG command) or i_bRJog (Reverse run JOG command) after i_bEN (Execution command) is turned ON, the JOG operation or inching operation is performed. • When i_bFJog (Forward run JOG command) and i_bRJog (Reverse run JOG command) are ON at the same time, the operation stops. • When i_bEN (Execution command) is turned OFF from ON during operation that has been started by i_bFJog (Forward run JOG command) or i_bRJog (Reverse run JOG command), the operation stops. • When i_bRJog (Reverse run JOG command) is turned ON during forward run JOG operation, the operation stops. However, when i_bRJog (Reverse run JOG command) is turned OFF from ON, the forward run JOG operation restarts. (This relation is also applied to the reverse run JOG operation and i_bFJog (Forward run JOG command). • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Real-time execution	

Item	Description
Timing chart	**When operation completes without an error** i_bEN (Execution command) o_bENO (Execution status) i_bFJog (Forward run JOG command) i_bRJog (Reverse run JOG command) o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 **When an error occurs** i_bEN (Execution command) o_bENO (Execution status) JOG operation — Standby o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • This FB turns ON and OFF the forward run JOG start signal (Cd.181) or reverse run JOG start signal (Cd.182). Thus, do not turn ON or OFF the forward run JOG start signal (Cd.181) or reverse run JOG start signal (Cd.182) by the other means while this FB is being executed. • When this FB is used twice or more or other FB that operates the same as the signal this FB does, create an interlock to prevent the FBs from being activated at the same time. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Setting a large value for the JOG speed from the beginning is dangerous. For the safety, set a small value first, and increase the value gradually while checking the operation to determine the value optimal for the control. • When values other than 0 are set in both i_uInching (Cd.16: Inching movement amount) and i_udJogSpeed (Cd.17: JOG speed), inching operation is performed. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting. (Turn OFF the forward run JOG command or reverse run JOG command, turn ON i_bEN from OFF, and turn ON the forward run JOG command or reverse run JOG command again.)

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Forward run JOG command	i_bFJog	Bit	ON, OFF	Turn ON this label when performing the forward run JOG operation or forward run inching operation.
Reverse run JOG command	i_bRJog	Bit	ON, OFF	Turn ON this label when performing the reverse run JOG operation or reverse run inching operation.
Cd.17: JOG speed	i_udJogSpeed	Double word [unsigned]	Pr.1: Unit setting = mm/inch/degree[*1] • 1 to 2000000000[*2] Pr.1: Unit setting = pulse • 1 to 1000000000	Specify the JOG speed. For inching operation, set 0.
Cd.16: Inching movement amount	i_uInching	Word [unsigned]	0 to 65535 0: JOG operation (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Specify the inching movement amount. For JOG operation, set 0.

*1   When "Pr.1 Unit setting" is set to "degree" and "Pr.83 Speed control 10 × multiplier setting for degree axis" is valid, the value is set as 10 times of setting value.
*2   The value is set corresponding to the setting of "Pr.1 Unit setting".

■Output labels

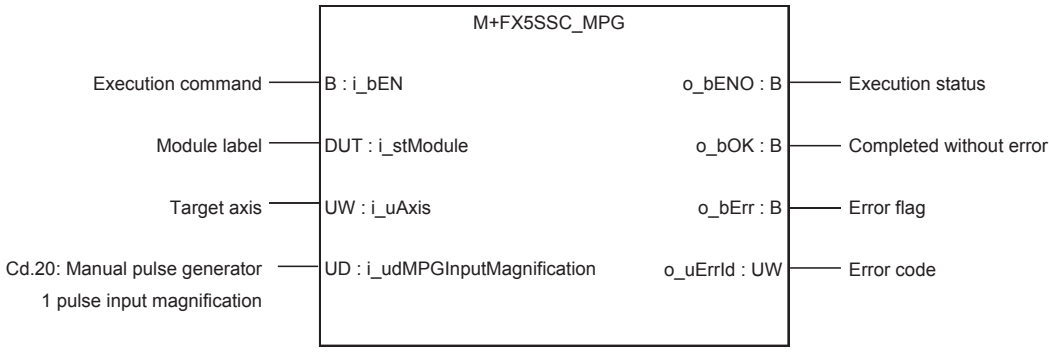| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	ON: The JOG command is ON. OFF: The JOG command is OFF.
Error flag	o_bErr	Bit	OFF	When ON, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The generated error code in the FB is stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.4   M+FX5SSC_MPG

Name

M+FX5SSC_MPG

Function overview

Item	Description
Function overview	Performs the manual pulse generator operation.
Symbol	 M+FX5SSC_MPG Execution command —— B : i_bEN o_bENO : B —— Execution status Module label —— DUT : i_stModule o_bOK : B —— Completed without error Target axis —— UW : i_uAxis o_bErr : B —— Error flag Cd.20: Manual pulse generator —— UD : i_udMPGInputMagnification o_uErrId : UW —— Error code 1 pulse input magnification
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	305 steps
Function description	• By turning ON or OFF i_bEN (Execution command), manual pulse generator operation is enabled or disabled. • This FB is constantly executed after i_bEN (Execution command) is turned ON. • The workpiece moves according to the pulses input from the manual pulse generator while o_bOK (Completed without error) is ON. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Real-time execution

Item	Description
Timing chart	When operation completes without an error

i_bEN (Execution command)

o_bENO (Execution status)

o_bOK
(Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)   0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

o_bOK
(Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)   0   Error code   0

Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
	• The FB cannot be used in an interrupt program.
	• Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF.
	• Do not change i_uAxis (Target axis) while i_bEN (Execution command) is ON.
	• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.
	• Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.20: Manual pulse generator 1 pulse input magnification	i_udMPGInputMagnification	Double word [unsigned]	1 to 10000	Set the input magnification of the manual pulse generator 1 pulse. When the setting value is 0, the magnification is 1. When the setting value is 10,001 or higher, the magnification is 10,000.

■Output labels

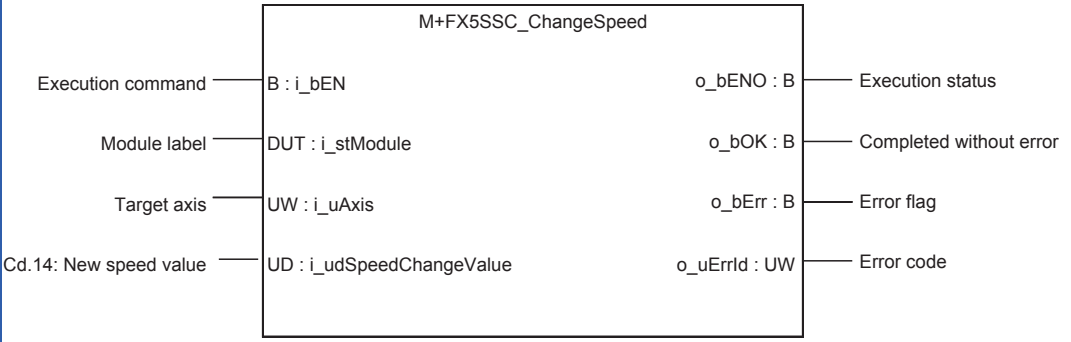| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that the manual pulse generator operation has been enabled.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.5 M+FX5SSC_ChangeSpeed

Name

M+FX5SSC_ChangeSpeed

Function overview

Item	Description
Function overview	Changes the speed.
Symbol	

	Applicable module	FX5-40SSC-S
Applicable hardware and software	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)

Programming language	Ladder
Number of steps (maximum)	243 steps
Function description	• By turning ON i_bEN (Execution command), the speed used for the control is changed to a new speed. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

The symbol shows the M+FX5SSC_ChangeSpeed block with the following connections:

- Execution command — B : i_bEN
- Module label — DUT : i_stModule
- Target axis — UW : i_uAxis
- Cd.14: New speed value — UD : i_udSpeedChangeValue
- o_bENO : B — Execution status
- o_bOK : B — Completed without error
- o_bErr : B — Error flag
- o_uErrId : UW — Error code

Item	Description
Timing chart	When operation completes without an error i_bEN (Execution command) o_bENO (Execution status) New-speed data writing processing: No processing / Write / No processing Speed change request (buffer memory) o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code): 0 When an error occurs i_bEN (Execution command) o_bENO (Execution status) New-speed data writing processing: No processing Speed change request (buffer memory) o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code): 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation. • When i_bEN (Execution command) is turned ON while the BUSY signal is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 201 (Hexadecimal) is stored in o_uErrId (Error code).

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.
201 (Hexadecimal)	This FB is executed before positioning operation starts.	Please try again during positioning operation.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.14: New speed value	i_udSpeedChangeValue	Double word [unsigned]	Pr.1: Unit setting = mm/inch/degree[*1] • 0 to 2000000000[*2] Pr.1: Unit setting = pulse • 0 to 1000000000	Set a new speed.

*1 When "Pr.1 Unit setting" is set to "degree" and "Pr.83 Speed control 10 × multiplier setting for degree axis" is valid, the value is set as 10 times of setting value.

*2 The value is set corresponding to the setting of "Pr.1 Unit setting".

■Output labels

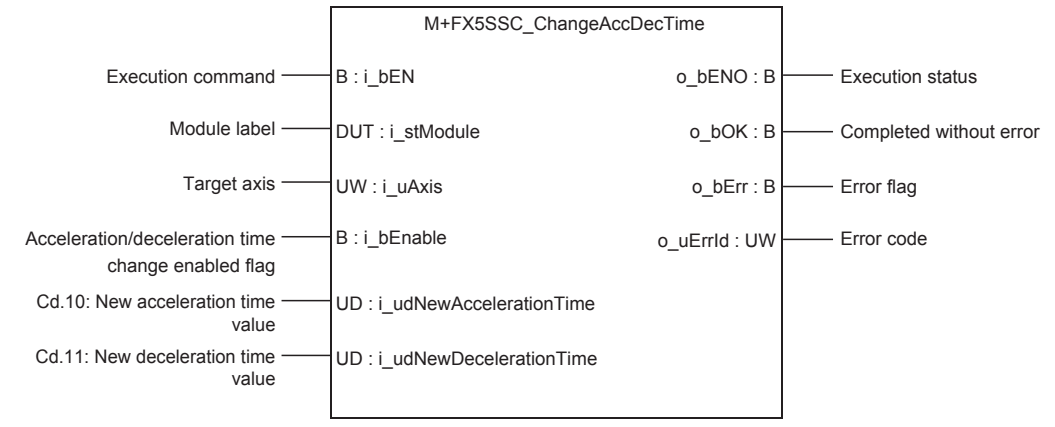| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing the speed has been completed.
Error flag	o_bErr	Bit	OFF	When ON, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The generated error code in the FB is stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition
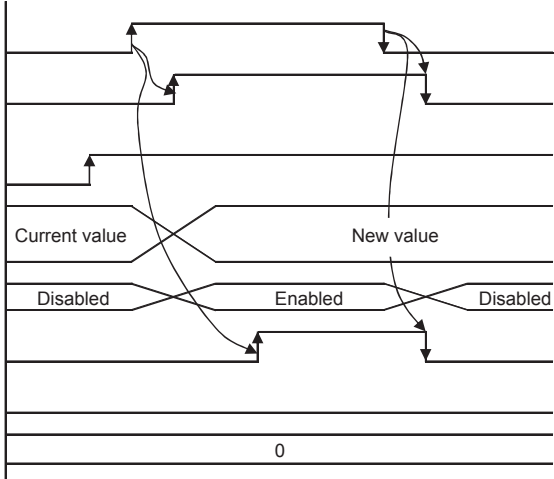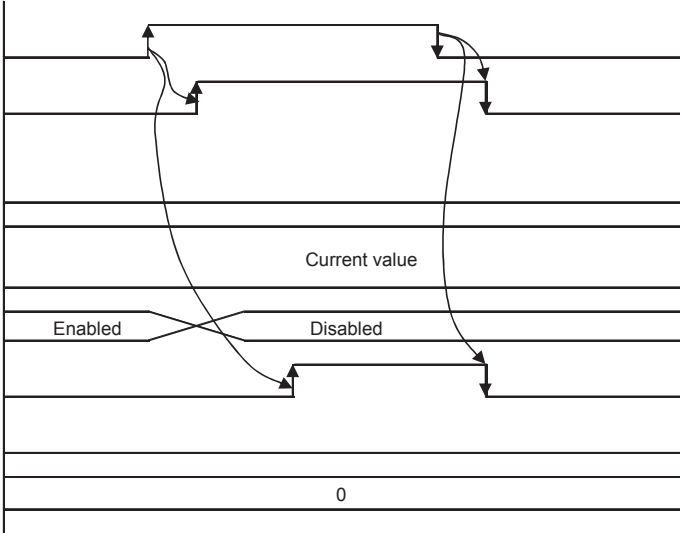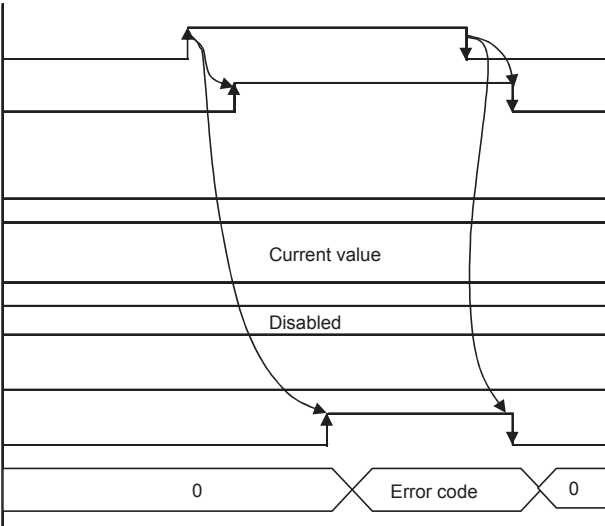
2.6   M+FX5SSC_ChangeAccDecTime

Name

M+FX5SSC_ChangeAccDecTime

Function overview

Item	Description	
Function overview	Changes the acceleration/deceleration time at a speed change.	
Symbol		
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	269 steps	
Function description	• By turning ON i_bEN (Execution command), the setting of the acceleration/deceleration time is changed according to i_bEnable (Acceleration/deceleration time change enabled flag). When i_bEnable (Acceleration/deceleration time change enabled flag) is ON, i_udNewAccelerationTime (Cd.10: New acceleration time value) and i_udNewDecelerationTime (Cd.11: New deceleration time value) are set and Cd.12: Acceleration/deceleration time change value during speed change, enable/disable is changed to 1: Enables modifications to acceleration/deceleration time. When i_bEnable (Acceleration/deceleration time change enabled flag) is OFF, i_udNewAccelerationTime (Cd.10: New acceleration time value) and i_udNewDecelerationTime (Cd.11: New deceleration time value) are not set and Cd.12: Acceleration/deceleration time change value during speed change, enable/disable is changed to 0: Disables modifications to acceleration/deceleration time. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Pulsed execution (single scan execution type)	

Item	Description
Timing chart	When operation completes without an error • (When Cd.12: Acceleration/deceleration time change value during speed change, enable/disable is enabled) i_bEN (Execution command) o_bENO (Execution status) i_bEnable (Acceleration/deceleration time change enabled flag) Cd.10/Cd.11: New acceleration time value/New deceleration time value — Current value / New value Acceleration/deceleration time change value, enable/disable — Disabled / Enabled / Disabled o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 • (When Cd.12: Acceleration/deceleration time change value during speed change, enable/disable is disabled) i_bEN (Execution command) o_bENO (Execution status) i_bEnable (Acceleration/deceleration time change enabled flag) Cd.10/Cd.11: New acceleration time value/New deceleration time value — Current value Acceleration/deceleration time change value, enable/disable — Enabled / Disabled o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 When an error occurs i_bEN (Execution command) o_bENO (Execution status) i_bEnable (Acceleration/deceleration time change enabled flag) Cd.10/Cd.11: New acceleration time value/New deceleration time value — Current value Acceleration/deceleration time change value, enable/disable — Disabled o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 / Error code / 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • A duplicated coil warning may occur during compile operation. However, this is not a problem and the FB will operate without an error. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Acceleration/ deceleration time change enabled flag	i_bEnable	Bit	ON: Enabled OFF: Disabled	Set this label to enable or disable acceleration/deceleration time changes.
Cd.10: New acceleration time value	i_udNewAccelerationTime	Double word [unsigned]	0 to 8388608 (ms)	Set a new acceleration time. When 0 is set, the acceleration time is not changed after the speed is changed. In this case, the previously set acceleration time is applied to the control.
Cd.11: New deceleration time value	i_udNewDecelerationTime	Double word [unsigned]	0 to 8388608 (ms)	Set a new deceleration time. When 0 is set, the deceleration time is not changed after the speed is changed. In this case, the previously set deceleration time is applied to the control.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that setting acceleration/deceleration time change has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition
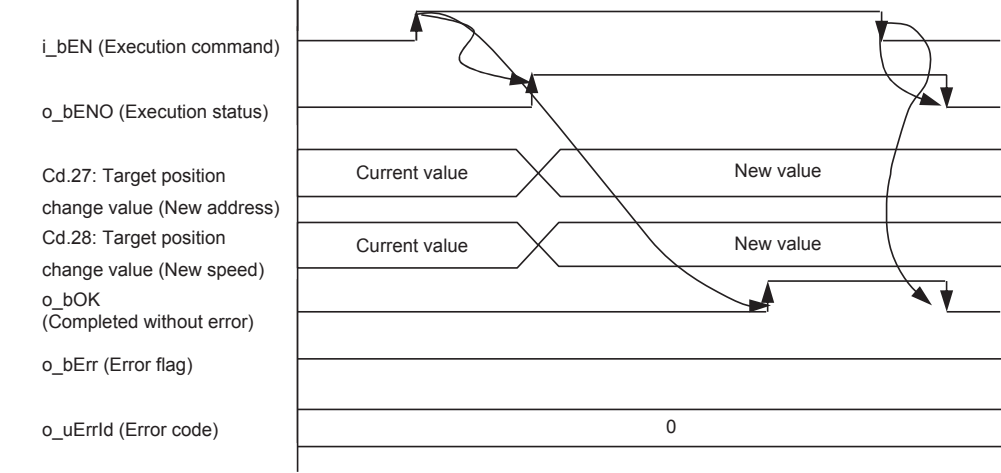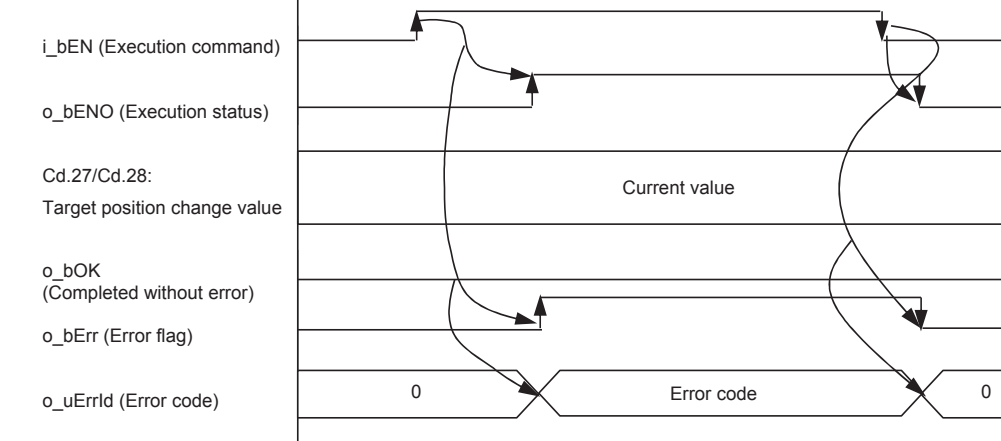
2.7 M+FX5SSC_ChangePosition

Name

M+FX5SSC_ChangePosition

Function overview

Item	Description
Function overview	Changes the target position.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	296 steps
Function description	• By turning ON i_bEN (Execution command), the target position is changed according to the value set in i_dTargetNewPosition (Cd.27: Target position change value (New address)) and the speed is changed according to the value set in i_udTargetNewSpeed (Cd.28: Target position change value (New speed)) during position control. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

The symbol block contains:

M+FX5SSC_ChangePosition

Inputs:
- Execution command — B : i_bEN
- Module label — DUT : i_stModule
- Target axis — UW : i_uAxis
- Cd.27: Target position change value (New address) — D : i_dTargetNewPosition
- Cd.28: Target position change value (New speed) — UD : i_udTargetNewSpeed

Outputs:
- o_bENO : B — Execution status
- o_bOK : B — Completed without error
- o_bErr : B — Error flag
- o_uErrId : UW — Error code

Item	Description
Timing chart	**When operation completes without an error** *(timing chart)* i_bEN (Execution command) o_bENO (Execution status) Cd.27: Target position change value (New address) — Current value / New value Cd.28: Target position change value (New speed) — Current value / New value o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 **When an error occurs** *(timing chart)* i_bEN (Execution command) o_bENO (Execution status) Cd.27/Cd.28: Target position change value — Current value o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation. • When i_bEN (Execution command) is turned ON while the BUSY signal is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 201 (Hexadecimal) is stored in o_uErrId (Error code).

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.
201 (Hexadecimal)	This FB is executed before positioning operation starts.	Please try again during positioning operation.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.27: Target position change value (New address)	i_dTargetNewPosition	Double word [signed]	Pr.1: Unit setting = mm • ABS: -2147483648 to 2147483647 • INC: -2147483648 to 2147483647 Pr.1: Unit setting = inch • ABS: -2147483648 to 2147483647 • INC: -2147483648 to 2147483647 Pr.1: Unit setting = degree • ABS: 0 to 35999999 • INC: -2147483648 to 2147483647 Pr.1: Unit setting = pulse • ABS: -2147483648 to 2147483647 • INC: -2147483648 to 2147483647	Set the new positioning address when changing the target position during positioning operation.
Cd.28: Target position change value (New speed)	i_udTargetNewSpeed	Double word [unsigned]	Pr.1: Unit setting = mm/inch/degree[*1] • 0 to 2000000000[*2] Pr.1: Unit setting = pulse • 0 to 1000000000	Set the new speed when changing the target position during positioning operation. When 0 is set, the speed is not changed.

[*1] When "Pr.1 Unit setting" is set to "degree" and "Pr.83 Speed control 10 × multiplier setting for degree axis" is valid, the value is set as 10 times of setting value.

[*2] The value is set corresponding to the setting of "Pr.1 Unit setting".

■Output labels

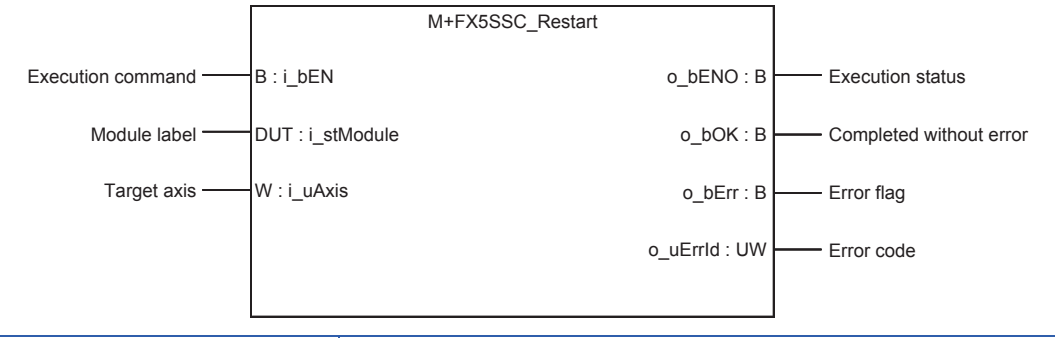| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that the module has accepted the target position change values.
Error flag	o_bErr	Bit	OFF	When ON, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The generated error code in the FB is stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition
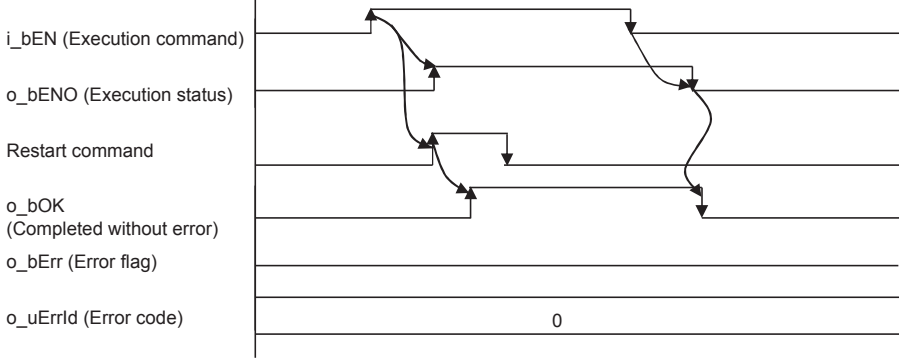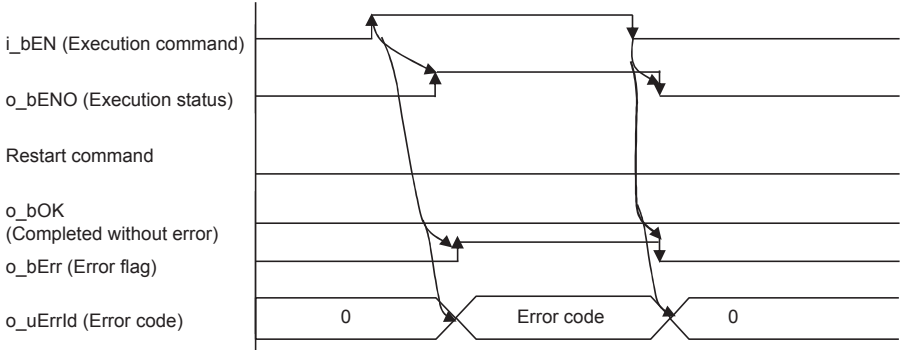
2.8 M+FX5SSC_Restart

Name

M+FX5SSC_Restart

Function overview

Item	Description
Function overview	Restarts the axis being stopped.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	282 steps
Function description	• Only when the conditions are met, the positioning operation that is stopped due to an error is restarted by turning ON i_bEN (Execution command). The conditions are the following: the positioning complete signal is OFF and the axis operation status is a stop. When any of the conditions is not met, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 202 (Hexadecimal) is stored in o_uErrId (Error code). • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

The Symbol cell contains:

M+FX5SSC_Restart

Input		Output	
Execution command	B : i_bEN	o_bENO : B	Execution status
Module label	DUT : i_stModule	o_bOK : B	Completed without error
Target axis	W : i_uAxis	o_bErr : B	Error flag
		o_uErrId : UW	Error code

Item	Description
Timing chart	When operation completes without an error i_bEN (Execution command) o_bENO (Execution status) Restart command o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code)　　0 When an error occurs i_bEN (Execution command) o_bENO (Execution status) Restart command o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code)　0　　Error code　　0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.
202 (Hexadecimal)	The conditions for positioning restart are not met. Any of the following conditions is not met. • Positioning complete signal: Off • Axis operation status: Stop	Please try again when all the following conditions are satisfied. • Positioning complete signal: Off • Axis operation status: Stop

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.

■Output labels

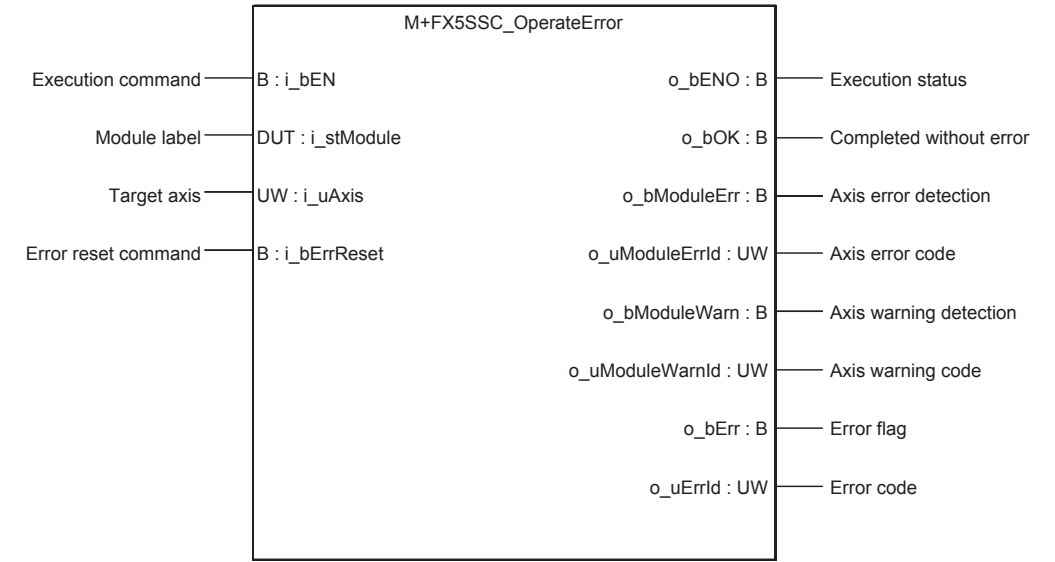| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that the module has accepted the restart command request.
Error flag	o_bErr	Bit	OFF	When ON, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The generated error code in the FB is stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.9 M+FX5SSC_OperateError

Name

M+FX5SSC_OperateError

Function overview

Item	Description
Function overview	Monitors errors and warnings, and resets errors.
Symbol	

	M+FX5SSC_OperateError	
Execution command	B : i_bEN	o_bENO : B — Execution status
Module label	DUT : i_stModule	o_bOK : B — Completed without error
Target axis	UW : i_uAxis	o_bModuleErr : B — Axis error detection
Error reset command	B : i_bErrReset	o_uModuleErrId : UW — Axis error code
		o_bModuleWarn : B — Axis warning detection
		o_uModuleWarnId : UW — Axis warning code
		o_bErr : B — Error flag
		o_uErrId : UW — Error code

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	396 steps	
Function description	• By turning ON i_bEN (Execution command), errors of the target axis are monitored. • When a module error occurs, an error code is stored in o_uModuleErrId (Axis error code). • After i_bEN (Execution command) is turned ON, the generated error is reset by turning ON i_bErrReset (Error reset command). • When a warning occurs in the module, the warning can be reset by turning ON i_bErrReset (Error reset command). • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Real-time execution	

Item	Description
Timing chart	**When operation completes without an error**
	i_bEN (Execution command)
	o_bENO (Execution status)
	i_bErrReset (Error reset command)
	Axis error reset — 0 / 1 / 0
	Error detection signal
	o_bModuleErr (Axis error detection)
	o_uModuleErrId (Axis error code) — 0 / Error code / 0
	o_bModuleWarn (Axis warning detection)
	o_uModuleWarnId (Axis warning code) — 0 / Warning code / 0
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrId (Error code) — 0
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	i_bErrReset (Error reset command)
	Axis error reset — 0
	Error detection signal
	o_bModuleErr (Axis error detection)
	o_uModuleErrId (Axis error code) — 0
	o_bModuleWarn (Axis warning detection)
	o_uModuleWarnId (Axis warning code) — 0
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrId (Error code) — 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Do not change i_uAxis (Target axis) while i_bEN (Execution command) is ON. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Error reset command	i_bErrReset	Bit	ON, OFF	ON: Errors are reset. OFF: Errors are not reset.

■Output labels

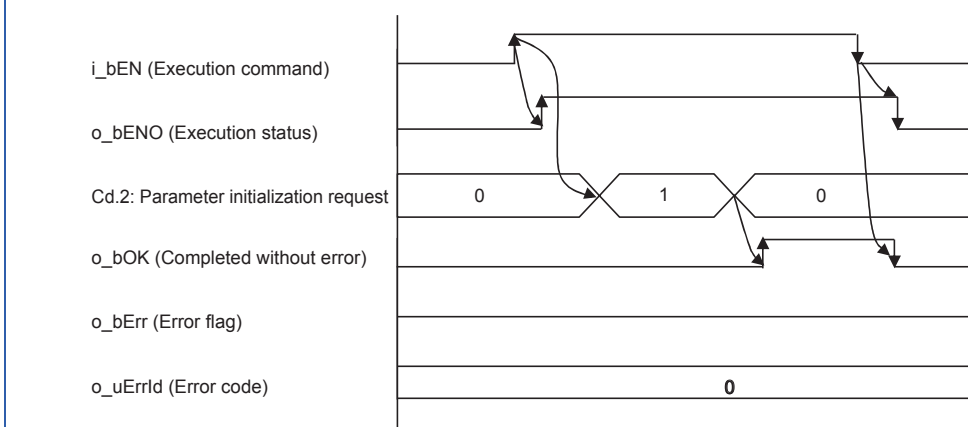| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that resetting the error has been completed.
Axis error detection	o_bModuleErr	Bit	OFF	When ON, it indicates that an axis error has occurred.
Axis error code	o_uModuleErrId	Word [unsigned]	0	An error code of an error that has occurred in the module of the specified axis is stored.
Axis warning detection	o_bModuleWarn	Bit	OFF	When ON, it indicates that an axis warning has occurred.
Axis warning code	o_uModuleWarnId	Word [unsigned]	0	A warning code of a warning that has occurred in the module of the specified axis is stored.
Error flag	o_bErr	Bit	OFF	When ON, it indicates that an error has occurred in the FB.
Error code	o_uErrId	Word [unsigned]	0	The generated error code in the FB is stored.

Version upgrade history
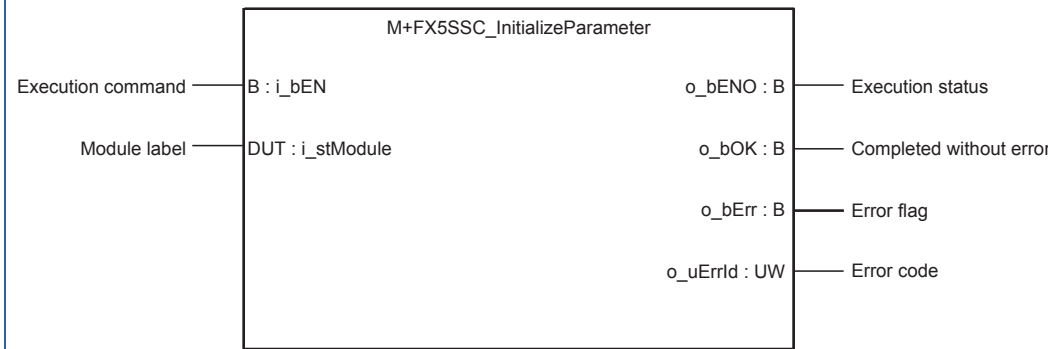
Version	Date	Description
1.00A	2015/04/23	First edition

2.10 M+FX5SSC_InitializeParameter

Name

M+FX5SSC_InitializeParameter

Function overview

Item	Description
Function overview	Initializes the parameter.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	66 steps
Function description	By turning ON i_bEN (Execution command), the setting data stored in the buffer memory and the flash ROM of the FX5-40SSC-S is reset to the factory setting.
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)
Timing chart	
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • Every input must be provided with a value for proper FB operation. • Before using this FB, make sure that the PLC READY signal is OFF. • After the setting data is initialized, reset the CPU module or restart the power of the programmable controller.

Error codes

Error code	Description	Action
None	None	None

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that initializing the parameter has been completed.
Error flag	o_bErr	Bit	OFF	Always OFF
Error code	o_uErrId	Word [unsigned]	0	Always 0

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.11 M+FX5SSC_WriteFlash

Name

M+FX5SSC_WriteFlash

Function overview

Item	Description
Function overview	Writes the parameter, positioning data, and block start data in the buffer memory to the flash ROM.
Symbol	

<table>
<tr><td colspan="2" align="center">M+FX5SSC_WriteFlash</td></tr>
<tr><td>Execution command — B : i_bEN</td><td>o_bENO : B — Execution status</td></tr>
<tr><td>Module label — DUT : i_stModule</td><td>o_bOK : B — Completed without error</td></tr>
<tr><td></td><td>o_bErr : B — Error flag</td></tr>
<tr><td></td><td>o_uErrId : UW — Error code</td></tr>
</table>

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	66 steps	
Function description	By turning ON i_bEN (Execution command), the setting data in the buffer memory is written to the flash ROM.	
Compiling method	Macro type	
FB operation type	Pulsed execution (multiple scan execution type)	
Timing chart		

```
i_bEN (Execution command)

o_bENO (Execution status)

Cd.1: Flash ROM writing request        0        1        0

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)                        0
```

Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • Every input must be provided with a value for proper FB operation. • Before using this FB, make sure that the PLC READY signal is OFF.

Error codes

Error code	Description	Action
None	None	None

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that writing the setting data to the flash ROM has been completed.
Error flag	o_bErr	Bit	OFF	Always OFF
Error code	o_uErrId	Word [unsigned]	0	Always 0

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.12 M+FX5SSC_ChangeServoParameter

Name

M+FX5SSC_ChangeServoParameter

Function overview

Item	Description
Function overview	Changes the servo parameter after the servo amplifier is activated.
Symbol	

<div style="text-align:center">

M+FX5SSC_ChangeServoParameter

Execution command —— B : i_bEN	o_bENO : B —— Execution status
Module label —— DUT : i_stModule	o_bOK : B —— Completed without error
Target axis —— UW : i_uAxis	o_bErr : B —— Error flag
Cd.131: Parameter No. —— UW : i_uParameterNo.	o_uErrId : UW —— Error code
Cd.132: Change data —— D : i_dChangeValue	

</div>

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	274 steps	
Function description	• By turning ON i_bEN (Execution command), the servo parameter after the servo amplifier is started is changed. • When the target axis of the input label is incorrectly set, o_bErr turns ON and the error code is stored in o_bErrId.	
Compiling method	Macro type	
FB operation type	Pulsed execution (multiple scan execution type)	

Item	Description
Timing chart	**When operation completes without an error** i_bEN (Execution command) o_bENO (Execution status) Parameter writing processing — No processing / Write / No processing o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 **When an error occurs** i_bEN (Execution command) o_bENO (Execution status) Parameter writing processing — No processing o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation. • Before using this FB, make sure that communication with the servo amplifier is established. • When this FB fails writing the parameter, o_bOK (Completed without error) does not turn ON. • The setting items and range differ depending on the module used in the system.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.131: Parameter No.	i_uParameterNo	Word [unsigned]	H0001 to H0C40	Set the servo parameter number to be changed. Set the data in the same specifications as [Cd.131] of the system control data. Even when the data No. different from the data specifications of [Cd.131] is specified, the execution of this FB is completed normally. In this case, an error may occur in the Simple Motion module. The following figure shows the data specifications of [Cd.131]. Setting value Parameter No. setting 01h to 40h Parameter group 0: PA group 1: PB group 2: PC group 3: PD group 4: PE group 5: PF group 9: PO group A: PS group Writing mode 0: Writing to the RAM
Cd.132: Change data	i_dChangeValue	Double word [signed]	Refer to the Servo Amplifier Instruction Manual.	Set the servo parameter value to be changed.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing the servo parameter has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition
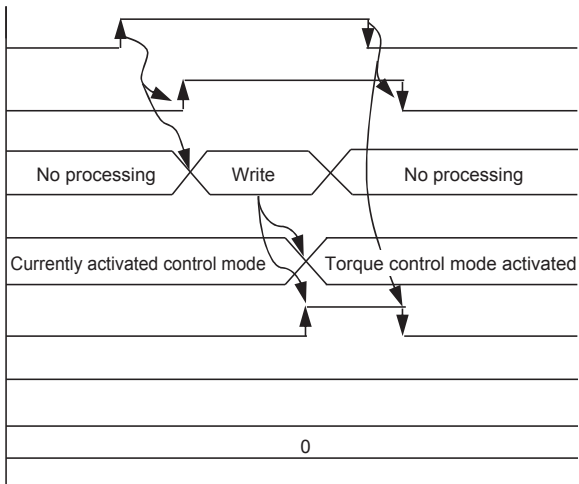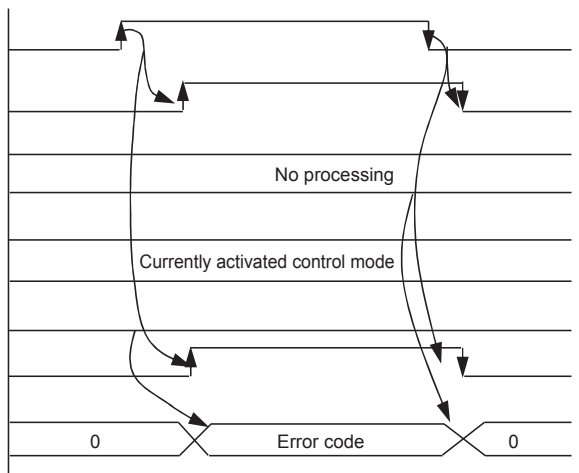
2.13 M+FX5SSC_ChangeTorqueControlMode

Name

M+FX5SSC_ChangeTorqueControlMode

Function overview

Item	Description
Function overview	Activates the torque control mode.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	424 steps
Function description	• By turning ON i_bEN (Execution command), the torque control mode is activated for the specified axis. • When this FB is executed under torque control, the command torque and speed limit value are changed. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

The Symbol diagram contents:

M+FX5SSC_ChangeTorqueControlMode

Input	Output
Execution command — B : i_bEN	o_bENO : B — Execution status
Module label — DUT : i_stModule	o_bOK : B — Completed without error
Target axis — UW : i_uAxis	o_bErr : B — Error flag
Cd.143: Command torque at torque control mode — W : i_wCommandTorque	o_uErrId : UW — Error code
Cd.144: Torque time constant at torque control mode (Forward direction) — UW : i_uTorqueTimeConstDrivingMode	
Cd.145: Torque time constant at torque control mode (Negative direction) — UW : i_uTorqueTimeConstRegenerativeMode	
Cd.146: Speed limit value at torque control mode — UD : i_udSpeedLimit	

Item	Description
Timing chart	**When operation completes without an error**

i_bEN (Execution command)

o_bENO (Execution status)

Control mode switching request writing · No processing · Write · No processing

Servo status control mode · Currently activated control mode · Torque control mode activated

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) · 0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

Control mode switching request writing · No processing

Servo status control mode · Currently activated control mode

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) · 0 · Error code · 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation. • When this FB fails switching the mode, o_bOK (Completed without error) does not turn ON.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.143: Command torque at torque control mode	i_wCommandTorque	Word [signed]	-10000 to 10000	Set the command torque at toque control mode.
Cd.144: Torque time constant at torque control mode (Forward direction)	i_uTorqueTimeConstDrivingMode	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the time constant for the driving of torque control mode.
Cd.145: Torque time constant at torque control mode (Negative direction)	i_uTorqueTimeConstRegenerativeMode	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the time constant for the regeneration of torque control mode.
Cd.146: Speed limit value at torque control mode	i_udSpeedLimit	Double word [unsigned]	Pr.1: Unit setting = mm/inch/degree[*1] • 0 to 2000000000[*2] Pr.1: Unit setting = pulse • 0 to 1000000000	Set the speed limit value at torque control mode.

*1 When "Pr.1 Unit setting" is set to "degree" and "Pr.83 Speed control 10 × multiplier setting for degree axis" is valid, the value is set as 10 times of setting value.

*2 The value is set corresponding to the setting of "Pr.1 Unit setting".

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing to the torqu control mode has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.14 M+FX5SSC_ChangeSpeedControlMode

Name

M+FX5SSC_ChangeSpeedControlMode

Function overview

Item	Description
Function overview	Activates the speed control mode.
Symbol	

	M+FX5SSC_ChangeSpeedControlMode	
Execution command	B : i_bEN	o_bENO : B — Execution status
Module label	DUT : i_stModule	o_bOK : B — Completed without error
Target axis	UW : i_uAxis	o_bErr : B — Error flag
Cd.140: Command speed at speed control mode	D : i_dCommandSpeed	o_uErrId : UW — Error code
Cd.141: Acceleration time at speed control mode	UW : i_uSpeedAccelerationTime	
Cd.142: Deceleration time at speed control mode	UW : i_uSpeedDecelerationTime	

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)

Programming language	Ladder
Number of steps (maximum)	372 steps
Function description	• By turning ON i_bEN (Execution command), the speed control mode is activated for the specified axis. • When this FB is executed under speed control, the command speed is changed. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

Item	Description
Timing chart	When operation completes without an error

When operation completes without an error:

- i_bEN (Execution command)
- o_bENO (Execution status)
- Control mode switching request writing: No processing / Write / No processing
- Servo status control mode: Currently activated control mode / Speed control mode activated
- o_bOK (Completed without error)
- o_bErr (Error flag)
- o_uErrId (Error code): 0

When an error occurs:

- i_bEN (Execution command)
- o_bENO (Execution status)
- Control mode switching request writing: No processing
- Servo status control mode: Currently activated control mode
- o_bOK (Completed without error)
- o_bErr (Error flag)
- o_uErrId (Error code): 0 / Error code / 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation. • When this FB fails switching the mode, o_bOK (Completed without error) does not turn ON.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.140: Command speed at speed control mode	i_dCommandSpeed	Double word [signed]	Pr.1: Unit setting = mm/inch/degree[*1] • -2000000000 to 2000000000[*2] Pr.1: Unit setting = pulse • -1000000000 to 1000000000	Set the command speed at speed control mode.
Cd.141: Acceleration time at speed control mode	i_uSpeedAccelerationTime	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the acceleration time at speed control mode.
Cd.142: Deceleration time at speed control mode	i_uSpeedDecelerationTime	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the deceleration time at speed control mode.

*1 When "Pr.1 Unit setting" is set to "degree" and "Pr.83 Speed control 10 × multiplier setting for degree axis" is valid, the value is set as 10 times of setting value.

*2 The value is set corresponding to the setting of "Pr.1 Unit setting".

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing to the speed control mode has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition
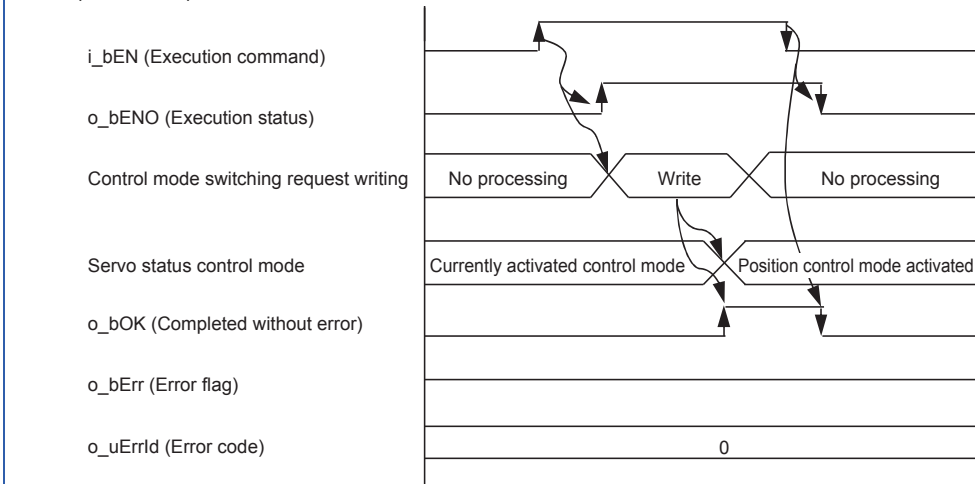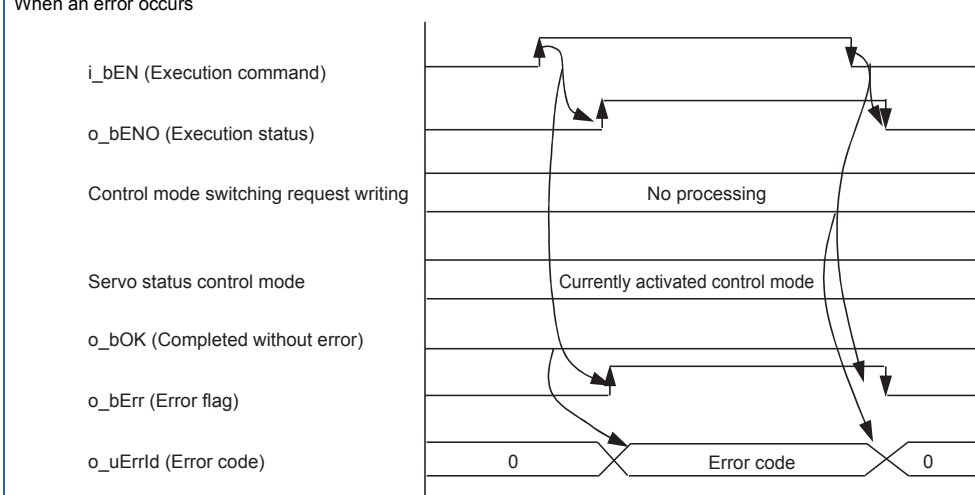
2.15 M+FX5SSC_ChangePositionControlMode

Name

M+FX5SSC_ChangePositionControlMode

Function overview

Item	Description
Function overview	Activates the position control mode.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	419 steps
Function description	• By turning ON i_bEN (Execution command), the position control mode is activated for the specified axis. • When this FB is executed during position control, the execution is completed without any processing. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

The Symbol diagram shows:

```
                    M+FX5SSC_ChangePositionControlMode
Execution command ── B : i_bEN              o_bENO : B ── Execution status
Module label ────── DUT : i_stModule        o_bOK : B ── Completed without error
Target axis ─────── UW : i_uAxis            o_bErr : B ── Error flag
                                            o_uErrId : UW ── Error code
```

Item	Description
Timing chart	**When operation completes without an error**

Timing chart — When operation completes without an error:
- i_bEN (Execution command)
- o_bENO (Execution status)
- Control mode switching request writing: No processing / Write / No processing
- Servo status control mode: Currently activated control mode / Position control mode activated
- o_bOK (Completed without error)
- o_bErr (Error flag)
- o_uErrId (Error code): 0

When an error occurs

Timing chart — When an error occurs:
- i_bEN (Execution command)
- o_bENO (Execution status)
- Control mode switching request writing: No processing
- Servo status control mode: Currently activated control mode
- o_bOK (Completed without error)
- o_bErr (Error flag)
- o_uErrId (Error code): 0 / Error code / 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation. • When this FB fails switching the mode, o_bOK (Completed without error) does not turn ON.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing to the positioning control mode has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history
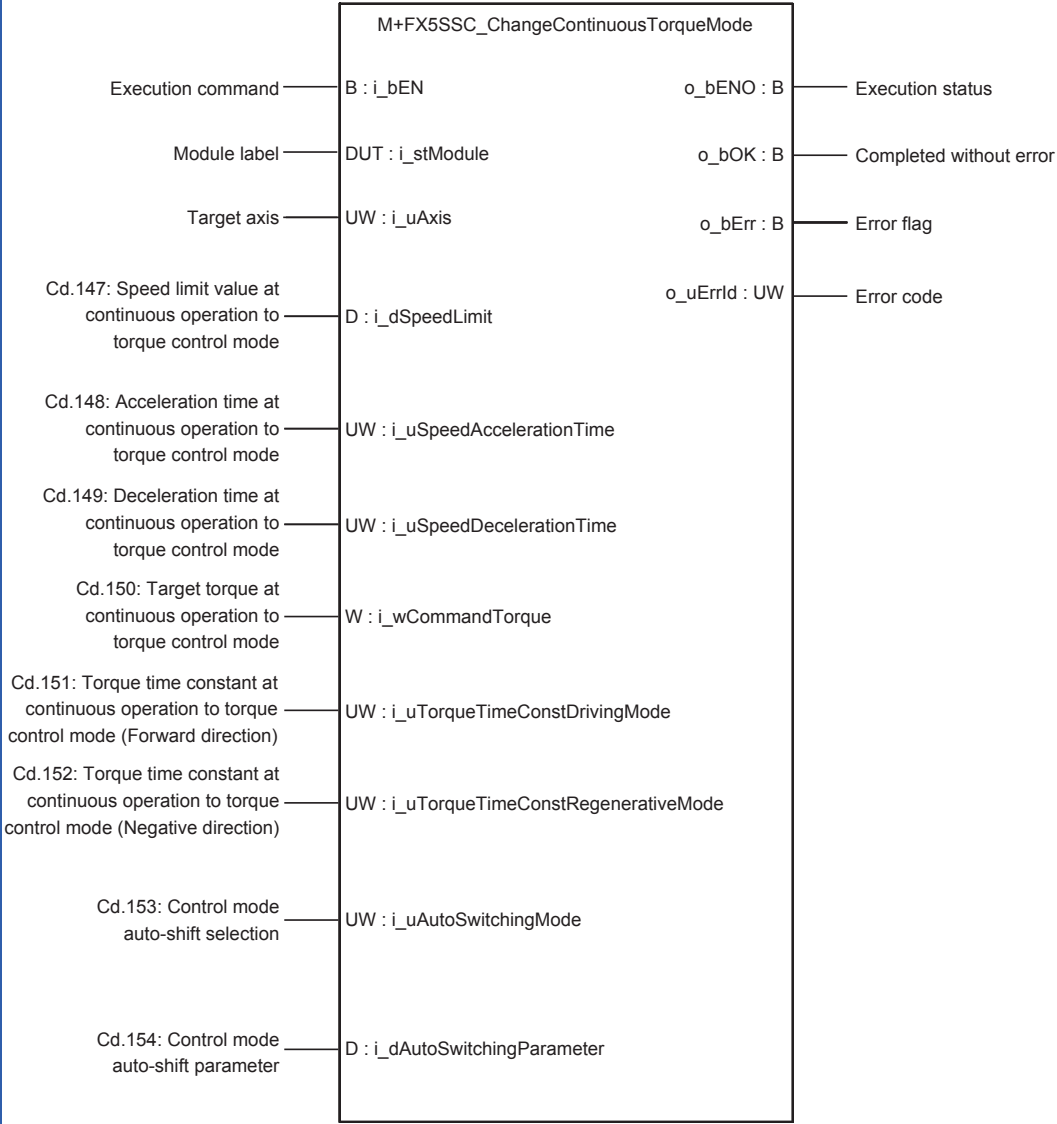
Version	Date	Description
1.00A	2015/04/23	First edition
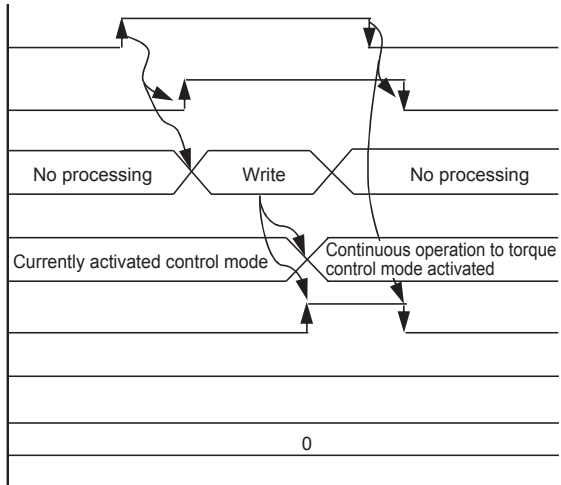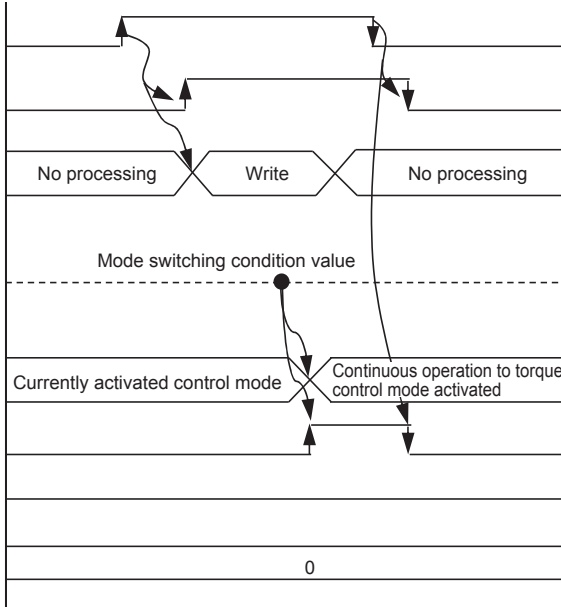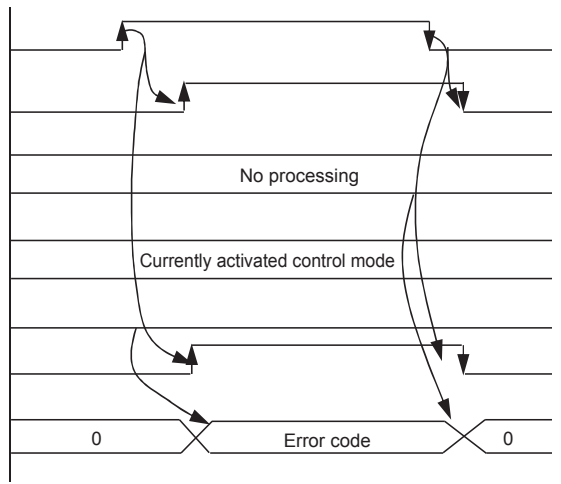
2.16 M+FX5SSC_ChangeContinuousTorqueMode

Name

M+FX5SSC_ChangeContinuousTorqueMode

Function overview

Item	Description
Function overview	Activates the continuous operation to torque control mode.
Symbol	

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	633 steps	
Function description	• By turning ON i_bEN (Execution command), the continuous operation to torque control mode is activated for the specified axis. • When this FB is executed during continuous operation to torque control mode, the speed limit value and target torque are changed. • When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Pulsed execution (multiple scan execution type)	

Item	Description
Timing chart	When operation completes without an error • When the control mode auto-shift selection is set to 0

When operation completes without an error
• When the control mode auto-shift selection is set to 0

i_bEN (Execution command)

o_bENO (Execution status)

Control mode switching request writing — No processing / Write / No processing

Servo status control mode — Currently activated control mode / Continuous operation to torque control mode activated

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) — 0

• When the control mode auto-shift selection is set to other than 0

i_bEN (Execution command)

o_bENO (Execution status)

Control mode switching request writing — No processing / Write / No processing

Feed current value or real current value — Mode switching condition value

Servo status control mode — Currently activated control mode / Continuous operation to torque control mode activated

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) — 0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

Control mode switching request writing — No processing

Servo status control mode — Currently activated control mode

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) — 0 / Error code / 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF. • When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis. • Every input must be provided with a value for proper FB operation. • When this FB fails switching the mode, o_bOK (Completed without error) does not turn ON.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 4	Specify the axis number.
Cd.147: Speed limit value at continuous operation to torque control mode	i_dSpeedLimit	Double word [signed]	Pr.1: Unit setting = mm/inch/degree[*1] • -2000000000 to 2000000000[*2] Pr.1: Unit setting = pulse • -1000000000 to 1000000000	Set the speed limit value at continuous operation to torque control mode.
Cd.148: Acceleration time at continuous operation to torque control mode	i_uSpeedAccelerationTime	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the acceleration time at continuous operation to torque control mode.
Cd.149: Deceleration time at continuous operation to torque control mode	i_uSpeedDecelerationTime	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the deceleration time at continuous operation to torque control mode.
Cd.150: Target torque at continuous operation to torque control mode	i_wCommandTorque	Word [signed]	-10000 to 10000	Set the target torque at continuous operation to torque control mode.
Cd.151: Torque time constant at continuous operation to torque control mode (Forward direction)	i_uTorqueTimeConstDrivingMode	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the time constant for the driving at continuous operation to torque control mode.
Cd.152: Torque time constant at continuous operation to torque control mode (Negative direction)	i_uTorqueTimeConstRegenerativeMode	Word [unsigned]	0 to 65535 (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the time constant for the regeneration at continuous operation to torque control mode.
Cd.153: Control mode auto-shift selection	i_uAutoSwitchingMode	Word [unsigned]	0 to 2	Set the switching condition of the control mode to switch to continuous operation to torque control mode.

Name	Variable name	Data type	Setting range	Description
Cd.154: Control mode auto-shift parameter	i_dAutoSwitchingParameter	Double word [signed]	Pr.1: Unit setting = mm/inch • -2147483648 to 2147483647[*2] Pr.1: Unit setting = degree • 0 to 35999999[*2] Pr.1: Unit setting = pulse • -2147483648 to 2147483647	Set the condition value when the control mode auto-shift selection is set to 1 or 2.

*1 When "Pr.1 Unit setting" is set to "degree" and "Pr.83 Speed control 10 × multiplier setting for degree axis" is valid, the value is set as 10 times of setting value.

*2 The value is set corresponding to the setting of "Pr.1 Unit setting".

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing to the continuous operation to torque control mode has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history
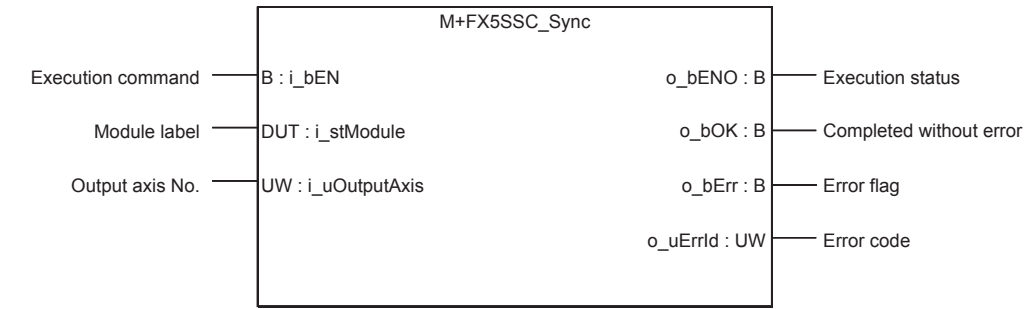
Version	Date	Description
1.00A	2015/04/23	First edition

2.17 M+FX5SSC_Sync

Name

M+FX5SSC_Sync

Function overview

Item	Description	
Function overview	Starts and ends the synchronous control.	
Symbol		

M+FX5SSC_Sync

Execution command ——	B : i_bEN	o_bENO : B —— Execution status
Module label ——	DUT : i_stModule	o_bOK : B —— Completed without error
Output axis No. ——	UW : i_uOutputAxis	o_bErr : B —— Error flag
		o_uErrId : UW —— Error code

Item	Description	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	195 steps	
Function description	• By turning ON i_bEN (Execution command), synchronous control of the output axis No. is started. Turning OFF i_bEN (Execution command) ends the synchronous control. • When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • The synchronous control does not start while the READY signal is OFF, the BUSY signal is ON, or the error detection signal is ON.	
Compiling method	Macro type	
FB operation type	Pulsed execution (multiple scan execution type)	

Item	Description
Timing chart	**When operation completes without an error** i_bEN (Execution command) o_bENO (Execution status) Axis operation status — Standby / Synchronous control activated / Standby o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 **When an error occurs** i_bEN (Execution command) o_bENO (Execution status) Axis operation status — Standby o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The output axis No. is not within the setting range.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 4	Specify the axis number for which synchronous control is started.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that synchronous control has been started.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.18 M+FX5SSC_ChangeSyncEncoderPosition

Name

M+FX5SSC_ChangeSyncEncoderPosition

Function overview

Item	Description
Function overview	Changes the synchronous encoder axis current value and synchronous encoder axis current value per cycle.
Symbol	 M+FX5SSC_ChangeSyncEncoderPosition Execution command — B : i_bEN o_bENO : B — Execution status Module label — DUT : i_stModule o_bOK : B — Completed without error Synchronous encoder axis No. — UW : i_uSyncEncAxis o_bErr : B — Error flag Cd.320: Synchronous encoder axis control start — UW : i_uStartControl o_uErrId : UW — Error code Cd.322: Synchronous encoder axis current value setting address — D : i_dNewPosition
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	269 steps
Function description	• The operation method differs depending on the setting value of the synchronous encoder axis control start. When the setting value is 1, the synchronous encoder axis current value is changed by turning ON i_bEN (Execution command). When the setting value is 101 to 104, the synchronous encoder axis current value is changed by the high speed input request [DI] after i_bEN (Execution command) is turned ON. • When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (single scan execution type)

Item	Description
Timing chart	**When operation completes without an error**

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous encoder axis control method — No processing | 0: Current value change

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) — 0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous encoder axis control method — No processing

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) — 0 | Error code | 0

Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The synchronous encoder axis No. is not within the setting range.	Please try again after confirming the setting.
301 (Hexadecimal)	The synchronous encoder axis enabled flag of the synchronous encoder axis No. is OFF.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Synchronous encoder axis No.	i_uSyncEncAxis	Word [unsigned]	1 to 4: Synchronous encoder axis number	Set the synchronous encoder axis number whose current value is to be changed.
Cd.320: Synchronous encoder axis control start	i_uStartControl	Word [unsigned]	1: Start for synchronous encoder axis control 101 to 104: High-speed input start for synchronous encoder axis control (axis 1 to axis 4)	When 1 is set, synchronous encoder axis control is started. When 101 to 104 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal).
Cd.322: Synchronous encoder axis current value setting address	i_dNewPosition	Double word [signed]	Pr.321: Synchronous encoder axis unit setting = mm/inch/degree/pulse • -2147483648 to 2147483647[*1]	Set the new current value after a current value change.

*1 The value is set corresponding to the setting of "Pr.321 Synchronous encoder axis unit setting".

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that setting the synchronous encoder axis current value change has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.19 M+FX5SSC_DisableSyncEncoder

Name

M+FX5SSC_DisableSyncEncoder

Function overview

Item	Description
Function overview	Disables inputs from the synchronous encoder axis.
Symbol	

M+FX5SSC_DisableSyncEncoder

Input	Output
Execution command —— B : i_bEN	o_bENO : B —— Execution status
Module label —— DUT : i_stModule	o_bOK : B —— Completed without error
Synchronous encoder axis No. —— UW : i_uSyncEncAxis	o_bErr : B —— Error flag
Cd.320: Synchronous encoder axis control start —— UW : i_uStartControl	o_uErrId : UW —— Error code

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	216 steps	
Function description	• The operation method differs depending on the setting value of the synchronous encoder axis control start. When the setting value is 1, the synchronous encoder axis counter is disabled by turning ON i_bEN (Execution command). When the setting value is 101 to 104, the synchronous encoder axis counter is disabled by the high speed input request [DI] after i_bEN (Execution command) is turned ON. • When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Pulsed execution (single scan execution type)	

Item	Description
Timing chart	When operation completes without an error
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous encoder axis control method — No processing — 1: Counter disable
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrId (Error code) — 0
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous encoder axis control method — No processing
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrId (Error code) — 0 — Error code — 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The synchronous encoder axis No. is not within the setting range.	Please try again after confirming the setting.
301 (Hexadecimal)	The synchronous encoder axis enabled flag of the synchronous encoder axis No. is OFF.	Execute the FB again after turning ON the synchronous encoder axis setting enabled flag.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Synchronous encoder axis No.	i_uSyncEncAxis	Word [unsigned]	1 to 4: Synchronous encoder axis number	Set the synchronous encoder axis number whose inputs are to be disabled.
Cd.320: Synchronous encoder axis control start	i_uStartControl	Word [unsigned]	1: Start for synchronous encoder axis control 101 to 104: High-speed input start for synchronous encoder axis control (axis 1 to axis 4)	When 1 is set, synchronous encoder axis control is started. When 101 to 104 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal).

■Output labels

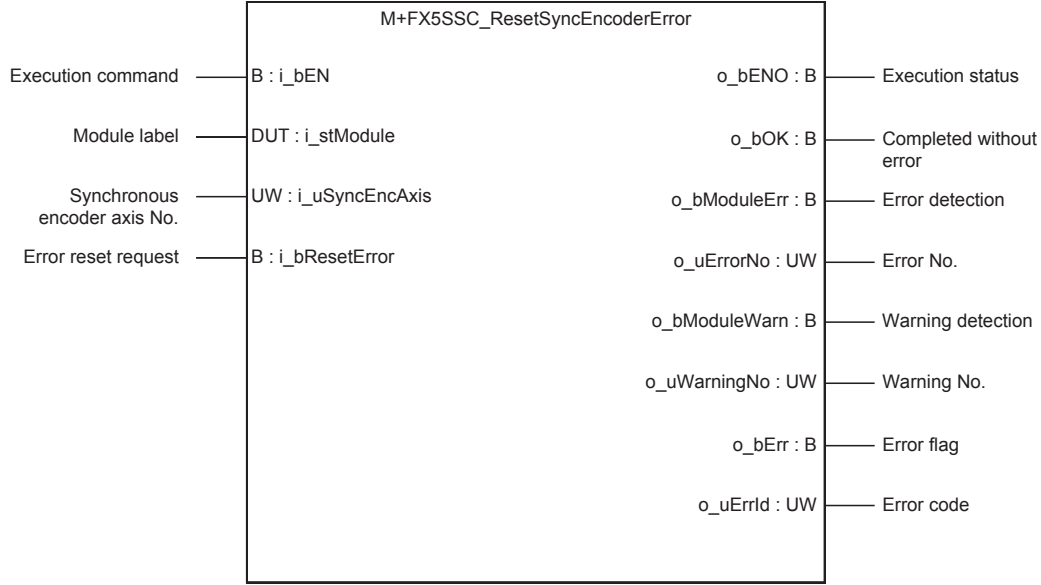| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that disabling the synchronous encoder axis counter has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.20 M+FX5SSC_EnableSyncEncoder

Name

M+FX5SSC_EnableSyncEncoder

Function overview

Item	Description
Function overview	Enables inputs from the synchronous encoder axis.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	216 steps
Function description	• The operation method differs depending on the setting value of the synchronous encoder axis control start. When the setting value is 1, the synchronous encoder axis counter is enabled by turning ON i_bEN (Execution command). When the setting value is 101 to 104, the synchronous encoder axis counter is enabled by the high speed input request [DI] after i_bEN (Execution command) is turned ON. • When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (single scan execution type)

Item	Description
Timing chart	When operation completes without an error i_bEN (Execution command) o_bENO (Execution status) Synchronous encoder axis control method — No processing / 2: Counter enable o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 When an error occurs i_bEN (Execution command) o_bENO (Execution status) Synchronous encoder axis control method — No processing o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The synchronous encoder axis No. is not within the setting range.	Please try again after confirming the setting.
301 (Hexadecimal)	The synchronous encoder axis enabled flag of the synchronous encoder axis No. is OFF.	Execute the FB again after turning ON the synchronous encoder axis setting enabled flag.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Synchronous encoder axis No.	i_uSyncEncAxis	Word [unsigned]	1 to 4: Synchronous encoder axis number	Set the synchronous encoder axis number whose inputs are to be enabled.
Cd.320: Synchronous encoder axis control start	i_uStartControl	Word [unsigned]	1: Start for synchronous encoder axis control 101 to 104: High-speed input start for synchronous encoder axis control (axis 1 to axis 4)	When 1 is set, synchronous encoder axis control is started. When 101 to 104 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal).

■Output labels

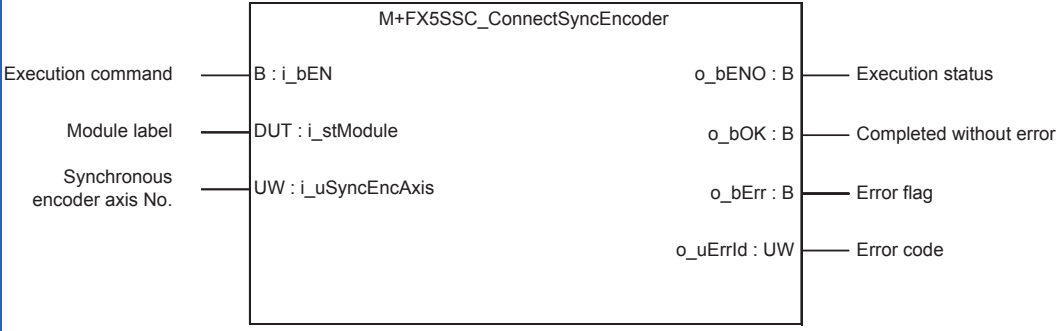| Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that enabling the synchronous encoder axis counter has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition
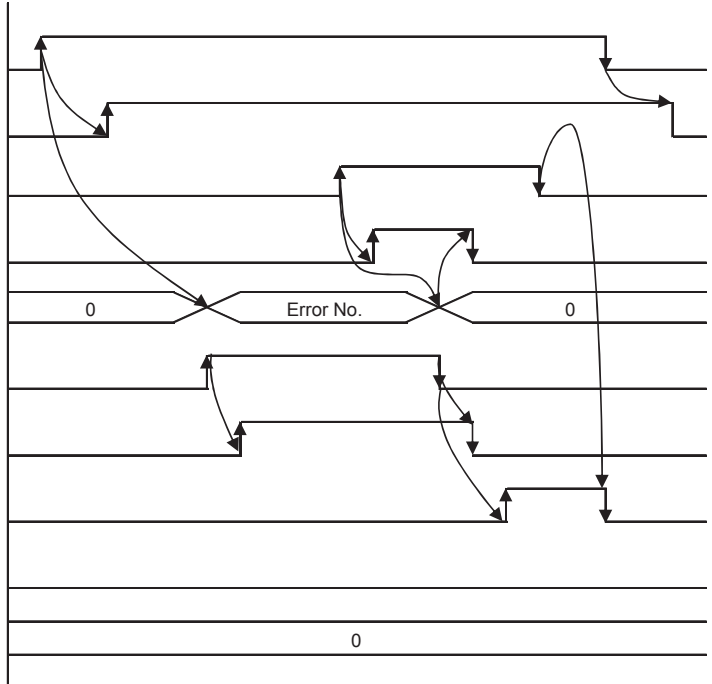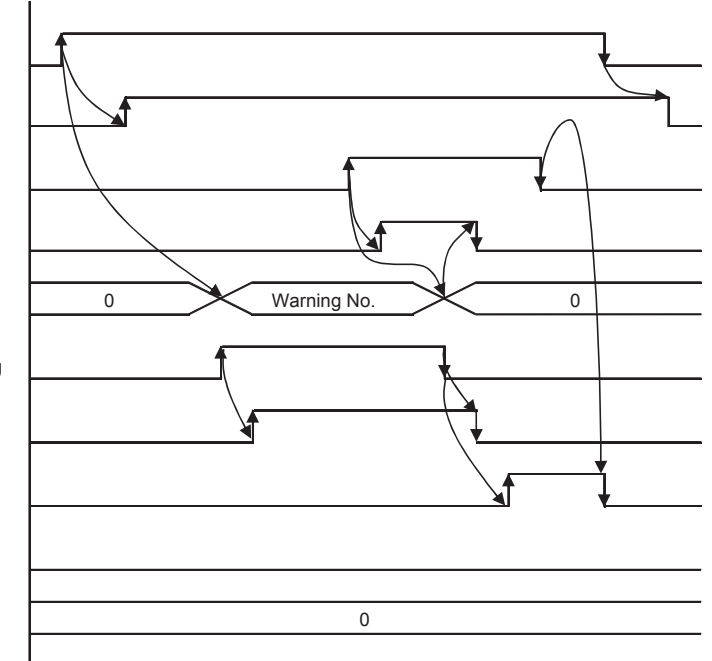
2.21　M+FX5SSC_ResetSyncEncoderError

Name

M+FX5SSC_ResetSyncEncoderError

Function overview

Item	Description
Function overview	Reads error information from the synchronous encoder axis, and resets the error.
Symbol	

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	447 steps	
Function description	• By turn ON i_bEN (Execution command), the synchronous encoder axis error and warning information of the synchronous encoder axis No. are read. • When the error reset request is ON, the error and warning are reset. • When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Real-time execution	

Item	Description
Timing chart	When operation completes without an error (error reset) i_bEN (Execution command) o_bENO (Execution status) i_bResetError (Error reset request) Synchronous encoder axis reset o_uErrorNo (Error No.) 0 Error No. 0 Synchronous encoder axis error flag o_bModuleErr (Error detection) o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) 0 When operation completes without an error (warning reset) i_bEN (Execution command) o_bENO (Execution status) i_bResetError (Error reset request) Synchronous encoder axis reset o_uWarningNo (Warning No.) 0 Warning No. 0 Synchronous encoder axis warning flag o_bModuleWarn (Warning detection) o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) 0

Item	Description
Timing chart	When an error occurs

i_bEN (Execution command)	
o_bENO (Execution status)	
i_bResetError (Error reset request)	
Synchronous encoder axis reset	
o_uErrorNo (Error No.)	0
o_uWarningNo (Warning No.)	0
Synchronous encoder axis error flag	
Synchronous encoder axis warning flag	
o_bModuleErr (Error detection)	
o_bModuleWarn (Warning detection)	
o_bOK (Completed without error)	
o_bErr (Error flag)	
o_uErrId (Error code)	0 / Error code / 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The synchronous encoder axis No. is not within the setting range.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Synchronous encoder axis No.	i_uSyncEncAxis	Word [unsigned]	1 to 4: Synchronous encoder axis number	Set the synchronous encoder axis number from which the error No. and warning No. are read.
Error reset request	i_bResetError	Bit	ON, OFF	Turn ON this label to reset errors. Turn OFF this label after the error reset is completed.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that the error detection flag and warning detection flag of the synchronous encoder axis status have been turned OFF.
Error detection	o_bModuleErr	Bit	OFF	When ON, it indicates that the synchronous encoder axis error has occurred.
Error No.	o_uErrorNo	Word [unsigned]	0	When the synchronous encoder axis error is detected, the error code corresponding to the error is stored.
Warning detection	o_bModuleWarn	Bit	OFF	When ON, it indicates that the synchronous encoder axis warning has occurred.
Warning No.	o_uWarningNo	Word [unsigned]	0	When the synchronous encoder axis warning is detected, the warning code corresponding to the warning is stored.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.22 M+FX5SSC_ConnectSyncEncoder

Name

M+FX5SSC_ConnectSyncEncoder

Function overview

Item	Description
Function overview	Connects a synchronous encoder via CPU.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	226 steps
Function description	• By turning ON i_bEN (Execution command), the synchronous encoder of the synchronous encoder axis No. is connected via CPU. • When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

Symbol diagram:

```
              M+FX5SSC_ConnectSyncEncoder
Execution command  —— B : i_bEN          o_bENO : B —— Execution status
Module label       —— DUT : i_stModule    o_bOK : B  —— Completed without error
Synchronous
encoder axis No.   —— UW : i_uSyncEncAxis  o_bErr : B —— Error flag
                                          o_uErrId : UW —— Error code
```

Item	Description
Timing chart	When operation completes without an error i_bEN (Execution command) o_bENO (Execution status) Connection command of synchronous encoder via CPU — No processing / 1: Connect synchronous encoder via CPU o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 When an error occurs i_bEN (Execution command) o_bENO (Execution status) Connection command of synchronous encoder via CPU — No processing o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) — 0 / Error code / 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The synchronous encoder axis No. is not within the setting range.	Please try again after confirming the setting.
301 (Hexadecimal)	The synchronous encoder axis enabled flag of the synchronous encoder axis No. is OFF.	Execute the FB again after turning ON the synchronous encoder axis setting enabled flag.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Synchronous encoder axis No.	i_uSyncEncAxis	Word [unsigned]	1 to 4: Synchronous encoder axis number	Set the synchronous encoder axis number for which the connection command of the synchronous encoder via CPU is executed.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that the connecting valid flag of the synchronous encoder axis status has been turned ON.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history
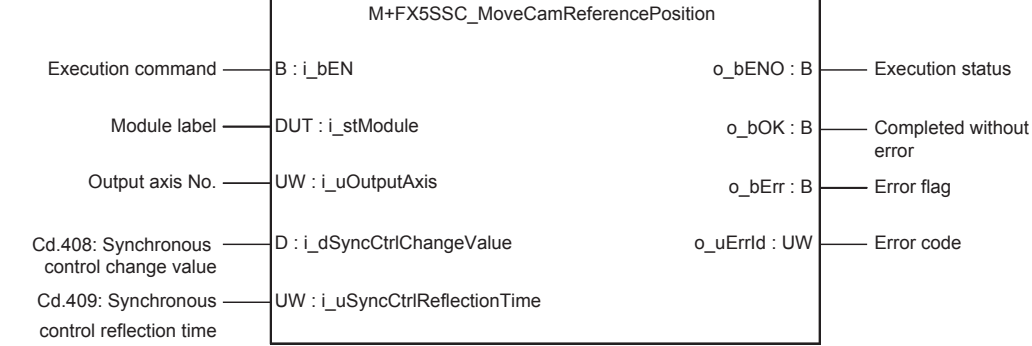
Version	Date	Description
1.00A	2015/04/23	First edition
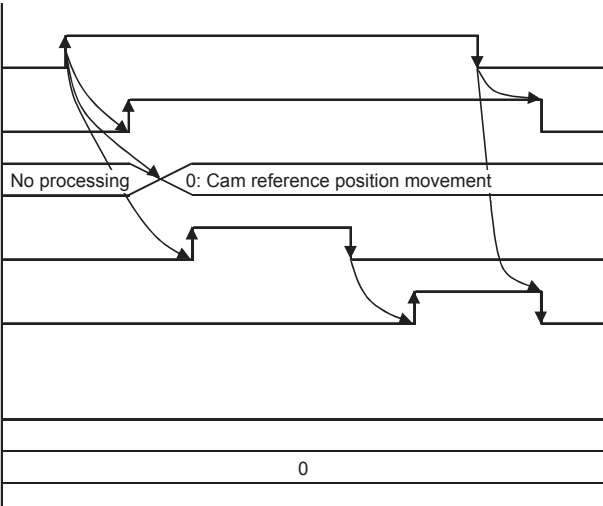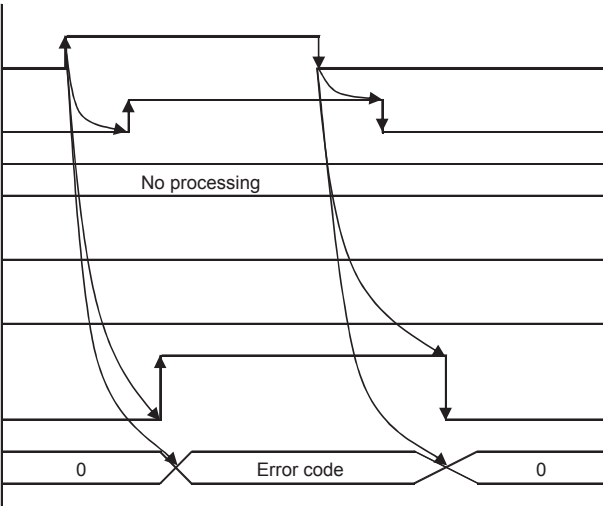
2.23 M+FX5SSC_MoveCamReferencePosition

Name

M+FX5SSC_MoveCamReferencePosition

Function overview

Item	Description
Function overview	Adds the movement amount set in the synchronous control change value to the cam reference position to move the cam reference position.
Symbol	

<table>
<tr><td colspan="2" align="center">M+FX5SSC_MoveCamReferencePosition</td></tr>
<tr><td>Execution command —— B : i_bEN</td><td>o_bENO : B —— Execution status</td></tr>
<tr><td>Module label —— DUT : i_stModule</td><td>o_bOK : B —— Completed without error</td></tr>
<tr><td>Output axis No. —— UW : i_uOutputAxis</td><td>o_bErr : B —— Error flag</td></tr>
<tr><td>Cd.408: Synchronous control change value —— D : i_dSyncCtrlChangeValue</td><td>o_uErrId : UW —— Error code</td></tr>
<tr><td>Cd.409: Synchronous control reflection time —— UW : i_uSyncCtrlReflectionTime</td><td></td></tr>
</table>

Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	427 steps	
Function description	• By turning ON i_bEN (Execution command), the cam reference position of the output axis No. is moved. • If i_bEN (Execution command) is turned OFF during movement of the cam reference position, the operation stops during the movement and o_bOK (Completed without error) does not turn ON. • When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the output axis No. with which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Pulsed execution (multiple scan execution type)	

Item	Description
Timing chart	When operation completes without an error

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous control change command — No processing — 0: Cam reference position movement

Synchronous control change request

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) — 0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous control change command — No processing

Synchronous control change request

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code) — 0 — Error code — 0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No. • If this FB is used together with other synchronous control change FBs that have the same output axis No., secure one operation cycle or more after o_bOK (Completed without error) of this FB turns ON and before the FBs are executed. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The output axis No. is not within the setting range.	Please try again after confirming the setting.
300 (Hexadecimal)	The FB is executed for the output axis No. with which synchronous control is not executed.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 4	Set the axis number whose cam reference position is to be moved.
Cd.408: Synchronous control change value	i_dSyncCtrlChangeValue	Double word [signed]	-2147483648 to 2147483647 *1*2	Set the amount of the cam reference position movement.
Cd.409: Synchronous control reflection time	i_uSyncCtrlReflectionTime	Word [unsigned]	0 to 65535 (ms) (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the reflection time for the synchronous control change.

*1 The output axis position unit is set to the value corresponding to the setting of "Pr.1 Unit setting" and the cam axis cycle unit is set to the value corresponding to the setting of "Pr.438 Cam axis cycle unit setting".

*2 The setting range is the same even if the unit differs.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that moving the cam reference position has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.24 M+FX5SSC_ChangeCamPositionPerCycle

Name

M+FX5SSC_ChangeCamPositionPerCycle

Function overview

Item	Description	
Function overview	Changes the cam axis current value per cycle to a synchronous control change value.	
Symbol		
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder	
Number of steps (maximum)	317 steps	
Function description	• By turning ON i_bEN (Execution command), the cam axis current value per cycle of the output axis No. is changed. • When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the output axis No. with which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code).	
Compiling method	Macro type	
FB operation type	Pulsed execution (multiple scan execution type)	

The symbol diagram shows:

```
          M+FX5SSC_ChangeCamPositionPerCycle

Execution command ——— B : i_bEN              o_bENO : B ——— Execution status

Module label ——— DUT : i_stModule            o_bOK : B ——— Completed without
                                                             error

Output axis No. ——— UW : i_uOutputAxis        o_bErr : B ——— Error flag

Cd.408: Synchronous
control change value ——— D : i_dSyncCtrlChangeValue   o_uErrId : UW ——— Error code
```

Item	Description
Timing chart	When operation completes without an error i_bEN (Execution command) o_bENO (Execution status) Synchronous control change command No processing 1: Change cam axis current value per cycle Synchronous control change request o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) 0 When an error occurs i_bEN (Execution command) o_bENO (Execution status) Synchronous control change command No processing Synchronous control change request o_bOK (Completed without error) o_bErr (Error flag) o_uErrId (Error code) 0 Error code 0
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No. • If this FB is used together with other synchronous control change FBs that have the same output axis No., secure one operation cycle or more after o_bOK (Completed without error) of this FB turns ON and before the FBs are executed. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The output axis No. is not within the setting range.	Please try again after confirming the setting.
300 (Hexadecimal)	The FB is executed for the output axis No. with which synchronous control is not executed.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 4	Set the axis number whose cam axis current value per cycle is to be changed.
Cd.408: Synchronous control change value	i_dSyncCtrlChange Value	Double word [signed]	-2147483648 to 2147483647[*1][*2]	Set the cam axis current value per cycle to be changed. The setting value is converted within the range from 0 to (Cam axis length per cycle - 1).

*1 The output axis position unit is set to the value corresponding to the setting of "Pr.1 Unit setting" and the cam axis cycle unit is set to the value corresponding to the setting of "Pr.438 Cam axis cycle unit setting".
*2 The setting range is the same even if the unit differs.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing the cam axis current value per cycle has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.25 M+FX5SSC_ChangeMainShaftGearPositionPerCycle

Name

M+FX5SSC_ChangeMainShaftGearPositionPerCycle

Function overview

Item	Description
Function overview	Changes the current value per cycle after main shaft gear to a synchronous control change value.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	317 steps
Function description	• By turning ON i_bEN (Execution command), the current value per cycle after main shaft gear of the output axis No. is changed. • When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the output axis No. with which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

Item	Description
Timing chart	When operation completes without an error

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous control change command

No processing   2: Change current value per cycle after main shaft gear

Synchronous control change request

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)   0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous control change command   No processing

Synchronous control change request

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)   0   Error code   0

| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
• The FB cannot be used in an interrupt program.
• When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No.
• If this FB is used together with other synchronous control change FBs that have the same output axis No., secure one operation cycle or more after o_bOK (Completed without error) of this FB turns ON and before the FBs are executed.
• Every input must be provided with a value for proper FB operation. |

Error codes

Error code	Description	Action
100 (Hexadecimal)	The output axis No. is not within the setting range.	Please try again after confirming the setting.
300 (Hexadecimal)	The FB is executed for the output axis No. with which synchronous control is not executed.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 4	Set the axis whose current value per cycle after main shaft gear is to be changed.
Cd.408: Synchronous control change value	i_dSyncCtrlChangeValue	Double word [signed]	-2147483648 to 2147483647[*1][*2]	Set the current value per cycle after main shaft gear to be changed. The setting value is converted within the range from 0 to (Cam axis length per cycle - 1).

*1 The output axis position unit is set to the value corresponding to the setting of "Pr.1 Unit setting" and the cam axis cycle unit is set to the value corresponding to the setting of "Pr.438 Cam axis cycle unit setting".

*2 The setting range is the same even if the unit differs.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing the current value per cycle after main shaft gear has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.26 M+FX5SSC_ChangeAuxiliaryShaftGearPositionPerCycle

Name

M+FX5SSC_ChangeAuxiliaryShaftGearPositionPerCycle

Function overview

Item	Description
Function overview	Changes the current value per cycle after auxiliary shaft gear to a synchronous control change value.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	317 steps
Function description	• By turning ON i_bEN (Execution command), the current value per cycle after auxiliary shaft gear of the output axis No. is changed. • When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the output axis No. with which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

The symbol block contains:

M+FX5SSC_ChangeAuxiliaryShaftGearPositionPerCycle

Input	Output
Execution command — B : i_bEN	o_bENO : B — Execution status
Module label — DUT : i_stModule	o_bOK : B — Completed without error
Output axis No. — UW : i_uOutputAxis	o_bErr : B — Error flag
Cd.408: Synchronous control change value — D : i_dSyncCtrlChangeValue	o_uErrId : UW — Error code

Item	Description
Timing chart	When operation completes without an error When an error occurs
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No. • If this FB is used together with other synchronous control change FBs that have the same output axis No., secure one operation cycle or more after o_bOK (Completed without error) of this FB turns ON and before the FBs are executed. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The output axis No. is not within the setting range.	Please try again after confirming the setting.
300 (Hexadecimal)	The FB is executed for the output axis No. with which synchronous control is not executed.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 4	Set the axis whose current value per cycle after auxiliary shaft gear is to be changed.
Cd.408: Synchronous control change value	i_dSyncCtrlChange Value	Double word [signed]	-2147483648 to 2147483647[*1][*2]	Set the current value per cycle after auxiliary shaft gear to be changed. The setting value is converted within the range from 0 to (Cam axis length per cycle - 1).

*1 The output axis position unit is set to the value corresponding to the setting of "Pr.1 Unit setting" and the cam axis cycle unit is set to the value corresponding to the setting of "Pr.438 Cam axis cycle unit setting".

*2 The setting range is the same even if the unit differs.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that changing the current value per cycle after auxiliary shaft gear has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.27 M+FX5SSC_MoveCamPositionPerCycle

Name

M+FX5SSC_MoveCamPositionPerCycle

Function overview

Item	Description
Function overview	Adds the movement amount set in the synchronous control change value to a cam axis current value per cycle to move the cam axis current value per cycle.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	427 steps
Function description	• By turning ON i_bEN (Execution command), the cam axis current value per cycle of the output axis No. is moved. • If i_bEN (Execution command) is turned OFF during movement of the cam axis current value per cycle, the operation stops during the movement and o_bOK (Completed without error) does not turn ON. • When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). • When this FB is executed for the output axis No. with which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code).
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)

For the Symbol:

M+FX5SSC_MoveCamPositionPerCycle

Input	Output
Execution command —— B : i_bEN	o_bENO : B —— Execution status
Module label —— DUT : i_stModule	o_bOK : B —— Completed without error
Output axis No. —— UW : i_uOutputAxis	o_bErr : B —— Error flag
Cd.408: Synchronous control change value —— D : i_dSyncCtrlChangeValue	o_uErrId : UW —— Error code
Cd.409: Synchronous control reflection time —— UW : i_uSyncCtrlReflectionTime	

Item	Description
Timing chart	**When operation completes without an error**

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous control change command

No processing   4: Cam axis current value per cycle movement

Synchronous control change request

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)   0

When an error occurs

i_bEN (Execution command)

o_bENO (Execution status)

Synchronous control change command   No processing

Synchronous control change request

o_bOK (Completed without error)

o_bErr (Error flag)

o_uErrId (Error code)   0   Error code   0

Item	Description
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • The FB cannot be used in an interrupt program. • When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No. • If this FB is used together with other synchronous control change FBs that have the same output axis No., secure one operation cycle or more after o_bOK (Completed without error) of this FB turns ON and before the FBs are executed. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
100 (Hexadecimal)	The output axis No. is not within the setting range.	Please try again after confirming the setting.
300 (Hexadecimal)	The FB is executed for the output axis No. with which synchronous control is not executed.	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 4	Set the axis number whose cam axis current value per cycle is to be moved.
Cd.408: Synchronous control change value	i_dSyncCtrlChangeValue	Double word [signed]	-2147483648 to 2147483647[*1][*2]	Set the amount of the cam axis current value per cycle movement.
Cd.409: Synchronous control reflection time	i_uSyncCtrlReflectionTime	Word [unsigned]	0 to 65535 (ms) (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)	Set the reflection time for the synchronous control change.

*1 The output axis position unit is set to the value corresponding to the setting of "Pr.1 Unit setting" and the cam axis cycle unit is set to the value corresponding to the setting of "Pr.438 Cam axis cycle unit setting".

*2 The setting range is the same even if the unit differs.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that moving the cam axis current value per cycle has been completed.
Error flag	o_bErr	Bit	OFF	When 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 stored.

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.28 M+FX5SSC_MakeRotaryCutterCam

Name

M+FX5SSC_MakeRotaryCutterCam

Function overview

Item	Description
Function overview	Automatically generates the cam for a rotary cutter.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	157 steps
Function description	By turning ON i_bEN (Execution command), the cam for a rotary cutter is automatically generated.
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)
Timing chart	
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • Even if a warning occurs in the execution of this FB, o_bOK (Completed without error) turns ON. • The FB cannot be used in an interrupt program. • Every input must be provided with a value for proper FB operation.
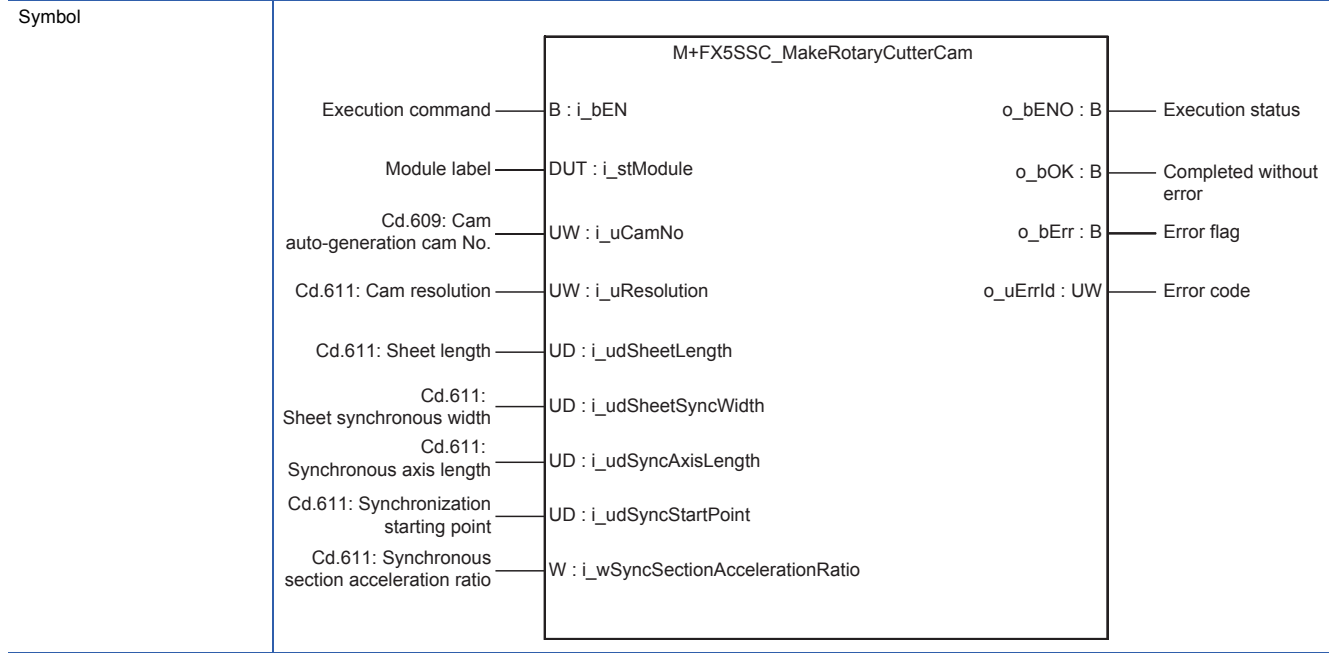
Error codes

Error code	Description	Action
None	None	None

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Cd.609: Cam auto-generation cam No.	i_uCamNo	Word [unsigned]	1 to 64	Set the cam number to be automatically generated.
Cd.611: Cam auto-generation data: Cam resolution	i_uResolution	Word [unsigned]	256/512/1024/2048/4096/8192/16384	Set the resolution of the cam to be generated.
Cd.611: Cam auto-generation data: Sheet length	i_udSheetLength	Double word [unsigned]	1 to 2147483647 [(Optional) same unit (such as 0.1 mm)]	Set the sheet length. Set this value in the cam axis length per cycle.
Cd.611: Cam auto-generation data: Sheet synchronous width	i_udSheetSyncWidth	Double word [unsigned]	1 to 2147483647 [(Optional) same unit (such as 0.1 mm)]	Set the sheet length of the synchronous section.
Cd.611: Cam auto-generation data: Synchronous axis length	i_udSyncAxisLength	Double word [unsigned]	1 to 2147483647 [(Optional) same unit (such as 0.1 mm)]	Set the cycle length of the rotary cutter shaft.
Cd.611: Cam auto-generation data: Synchronization starting point	i_udSyncStartPoint	Double word [unsigned]	1 to 2147483647 [(Optional) same unit (such as 0.1 mm)]	Set the length from the beginning of the sheet to the start of the synchronous section.
Cd.611: Cam auto-generation data: Synchronous section acceleration ratio	i_wSyncSectionAccelerationRatio	Word [signed]	-5000 to 5000 [0.01%]	Set this label when the synchronous speed in the synchronous section needs to be adjusted. The speed is "Synchronous speed × (100% + Acceleration ratio)" in the synchronous section.

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that the cam automatic generation has been completed.
Error flag	o_bErr	Bit	OFF	Always OFF
Error code	o_uErrId	Word [unsigned]	0	Always 0

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.29 M+FX5SSC_CalcCamCommandPosition

Name

M+FX5SSC_CalcCamCommandPosition

Function overview

Item	Description
Function overview	Calculates a cam axis feed current value, and outputs the calculation result.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	135 steps
Function description	By turning ON i_bEN (Execution command), the cam axis feed current value is calculated.
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)
Timing chart	
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • Even if a warning occurs in the execution of this FB, o_bOK (Completed without error) turns ON. • The FB cannot be used in an interrupt program. • Every input must be provided with a value for proper FB operation.

Error codes

Error code	Description	Action
None	None	None

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Cd.613: Cam position calculation: Cam No.	i_uCamNo	Word [unsigned]	0 to 64	Set the cam number used for the calculation cam.
Cd.614: Cam position calculation: Stroke amount	i_dStroke	Double word [signed]	-2147483648 to 2147483647[*1]	Set the cam stroke amount used for the cam position calculation.
Cd.615: Cam position calculation: Cam axis length per cycle	i_udLengthPerCycle	Double word [unsigned]	1 to 2147483647[*2]	Set the cam axis length per cycle used for the cam position calculation.
Cd.616: Cam position calculation: Cam reference position	i_dReferencePosition	Double word [signed]	-2147483648 to 2147483647[*1]	Set the cam reference position used for the cam position calculation.
Cd.617: Cam position calculation: Cam axis current value per cycle	i_udCommandPositionPerCycle	Double word [unsigned]	0 to (Cam axis length per cycle)[*2]	Set the cam axis current value per cycle used for the cam position calculation.

*1 The setting range is the same even if the output axis position unit differs.

*2 The setting range is the same even if the cam axis cycle unit differs. The cam axis cycle unit is set to the value corresponding to the setting of "Pr.438 Cam axis cycle unit setting".

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that calculating the cam axis feed current value has been completed.
Cam position calculation result	o_dResult	Double word [signed]	0	The result of the cam axis feed current value calculation is stored.
Error flag	o_bErr	Bit	OFF	Always OFF
Error code	o_uErrId	Word [unsigned]	0	Always 0

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

2.30 M+FX5SSC_CalcCamPositionPerCycle

Name

M+FX5SSC_CalcCamPositionPerCycle

Function overview

Item	Description
Function overview	Calculates a cam axis current value per cycle, and outputs the calculation result.
Symbol	
Applicable hardware and software	Applicable module	FX5-40SSC-S
	Applicable CPU	MELSEC iQ-F series
	Applicable engineering software	GX Works3 (Version 1.010L or later)
Programming language	Ladder
Number of steps (maximum)	149 steps
Function description	By turning ON i_bEN (Execution command), the cam axis current value per cycle is calculated.
Compiling method	Macro type
FB operation type	Pulsed execution (multiple scan execution type)
Timing chart	
Restrictions and precautions	• The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • Even if a warning occurs in the execution of this FB, o_bOK (Completed without error) turns ON. • The FB cannot be used in an interrupt program. • Every input must be provided with a value for proper FB operation.

The symbol block shows:

M+FX5SSC_CalcCamPositionPerCycle

Inputs:
- Execution command — B : i_bEN
- Module label — DUT : i_stModule
- Cd.613: Cam No. — UW : i_uCamNo
- Cd.614: Stroke amount — D : i_dStroke
- Cd.615: Cam axis length per cycle — UD : i_udLengthPerCycle
- Cd.616: Cam reference position — D : i_dReferencePosition
- Cd.617: Cam axis current value per cycle — UD : i_udCommandPositionPerCycle
- Cd.618: Cam axis feed current value — D : i_dCommandPosition

Outputs:
- o_bENO : B — Execution status
- o_bOK : B — Completed without error
- o_dResult : D — Cam position calculation result
- o_bErr : B — Error flag
- o_uErrId : UW — Error code

Timing chart signals:
- i_bEN (Execution command)
- o_bENO (Execution status)
- Cam position calculation request
- o_dResult (Cam position calculation result): 0 / Calculation result / 0
- o_bOK (Completed without error)

Error codes

Error code	Description	Action
None	None	None

Labels

■Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	i_bEN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module label	i_stModule	Structure	The setting range differs depending on the module label.	Specify the module label of the MELSEC iQ-F Simple Motion module.
Cd.613: Cam No.	i_uCamNo	Word [unsigned]	0 to 64	Set the cam number used for the calculation cam.
Cd.614: Stroke amount	i_dStroke	Double word [signed]	-2147483648 to 2147483647[*1]	Set the cam stroke amount used for the cam position calculation.
Cd.615: Cam axis length per cycle	i_udLengthPerCycle	Double word [unsigned]	1 to 2147483647[*2]	Set the cam axis length per cycle used for the cam position calculation.
Cd.616: Cam reference position	i_dReferencePosition	Double word [signed]	-2147483648 to 2147483647[*1]	Set the cam reference position used for the cam position calculation.
Cd.617: Cam axis current value per cycle	i_udCommandPositionPerCycle	Double word [unsigned]	0 to (Cam axis length per cycle)[*2]	Set the current value from which the cam search used for the cam position calculation is started.
Cd.618: Cam axis feed current value	i_dCommandPosition	Double word [signed]	-2147483648 to 2147483647[*1]	Set the cam axis feed current value used for the cam position calculation.

*1 The setting range is the same even if the output axis position unit differs.
*2 The setting range is the same even if the cam axis cycle unit differs. The cam axis cycle unit is set to the value corresponding to the setting of "Pr.438 Cam axis cycle unit setting".

■Output labels

Name	Variable name	Data type	Default value	Description
Execution status	o_bENO	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
Completed without error	o_bOK	Bit	OFF	When ON, it indicates that calculating the cam axis current value per cycle has been completed.
Cam position calculation result	o_dResult	Double word [signed]	0	The result of the cam axis current value per cycle calculation is stored.
Error flag	o_bErr	Bit	OFF	Always OFF
Error code	o_uErrId	Word [unsigned]	0	Always 0

Version upgrade history

Version	Date	Description
1.00A	2015/04/23	First edition

REVISIONS

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