

## Mitsubishi Programmable Controller

# MELSEC iQ-R

## MELSEC iQ-R Simple Motion Module Function Block Reference

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#### This FB list is for using the MELSEC iQ-R series simple motion module.

Name	Description
M+RD77_SetPositioningData	Sets positioning data (Da.1 to Da.10, Da.20 to Da.22, Da.27 to Da.29).
M+RD77_StartPositioning	Starts the positioning operation.
M+RD77_JOG	Performs the JOG operation or inching operation.
M+RD77_MPG	Performs the manual pulse generator operation.
M+RD77_ChangeSpeed	Changes the speed.
M+RD77_ChangeAccDecTime	Changes the acceleration/deceleration time at a speed change.
M+RD77_ChangePosition	Changes the target position.
M+RD77_Restart	Restarts the axis being stopped.
M+RD77_OperateError	Monitors errors and warnings, and resets errors.
M+RD77_InitializeParameter	Initializes the parameter.
M+RD77_WriteFlash	Writes the parameter, positioning data, and block start data in the buffer memory to the flash ROM.
M+RD77_ ChangeServoParameter	Changes the servo parameter after the amplifier is activated.
M+RD77_ ChangeTorqueControlMode	Sets torque limit values in the forward direction and reverse direction individually.
M+RD77_ ChangeSpeedControlMode	Activates the speed control mode.
M+RD77_ ChangePositionControlMode	Activates the position control mode.
M+RD77_ChangeContinuousTorqueMode	Activates the continuous operation to torque control mode.
M+RD77_Sync	Starts and ends the synchronous control.
M+RD77_ChangeSyncEncoderPosition	Changes the synchronous encoder axis current value and synchronous encoder axis current value per cycle.
M+RD77_DisableSyncEncoder	Disables inputs from the synchronous encoder axis.
M+RD77_EnableSyncEncoder	Enables inputs from the synchronous encoder axis.
M+RD77_ResetSyncEncoderError	Reads error information from the synchronous encoder axis, and resets the error.
M+RD77_ConnectSyncEncoder	Connects a synchronous encoder via CPU.
M+RD77_MoveCamReferencePosition	Adds the movement amount set in the synchronous control change value to the cam reference position to move the cam reference position.
M+RD77_ChangeCamPositionPerCycle	Changes the cam axis current value per cycle to a synchronous control change value.
M+RD77_ChangeMainShaftGearPositionPerCycle	Changes the current value per cycle after main shaft gear to a synchronous control change value.
M+RD77_ChangeAuxiliaryShaftGearPositionPerCycle	Changes the current value per cycle after auxiliary shaft gear to a synchronous control change value.
M+RD77_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+RD77_MakeRotaryCutterCam	Automatically generates the cam for a rotary cutter.
M+RD77_CalcCamCommandPosition	Calculates a cam axis feed current value, and outputs the calculation result.
M+RD77_CalcCamPositionPerCycle	Calculates a cam axis current value per cycle, and outputs the calculation result.

# **2** Simple Motion Module FB

## 2.1 M+RD77\_SetPositioningData

#### Name

M+RD77\_SetPositioningData

#### **Function overview** Item Description Sets positioning data (Da.1 to Da.10, Da.20 to Da.22, Da.27 to Da.29). Function overview Symbol M+RD77 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 uErrld : UW Error code Applicable hardware and Applicable module RD77MS16, RD77MS8, RD77MS4, RD77MS2 software Applicable CPU MELSEC iQ-R series GX Works3 Applicable engineering software Programming language Ladder Number of steps (maximum) 209 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\_uErrld (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\_uErrld (Error code). Compiling method Macro type FB operation type Pulsed execution (single scan execution type)

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Item	Description	
Timing chart	When operation completes without an error	
	i_bEN (Execution command)	
	o_bENO (Execution status)	
	Positioning data setting processing Write No processing	ıg
	o_bOK (Completed without error)	
	o_bErr (Error flag)	
	o_uErrld (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_uErrld (Error code) 0 Error code	0
Restrictions and precaution	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordar the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in protect that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) can turned OFF.</li> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>	ograms

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 16.	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.			

#### ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
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_uErrld	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 the positioning is completed with the data being executed, or continues with the following data. When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled. For example, when 4 is set, 0 is applied.
Da.2: Control system	pb_uCtrlSys	Word [unsigned]	<ul> <li>01H: ABS1 1-axis linear control (ABS)</li> <li>02H: INC1 1-axis linear control (INC)</li> <li>03H: FEED1 1-axis fixed-feed control</li> <li>04H: VF1 1-axis speed control (Forward)</li> <li>05H: VR1 1-axis speed control (Reverse)</li> <li>06H: VPF Speed-position switching control (Forward)</li> <li>07H: VPR Speed-position switching control (Reverse)</li> <li>08H: PVF Position-speed switching control (Reverse)</li> <li>08H: NC2 2-axis linear interpolation control (INC)</li> <li>0CH: FEED2 Fixed-feed control by 2-axis linear interpolation</li> <li>0DH: ABS^ Circular interpolation control with sub point designation (ABS)</li> <li>0EH: INC^ Circular interpolation control with sub point designation (ABS, CW)</li> <li>0H: ABS. Circular interpolation control with center point designation (INC)</li> <li>0FH: ABS. Circular interpolation control with center point designation (INC, CW)</li> <li>12H: INC. Circular interpolation control with center point designation (INC, CW)</li> <li>12H: INC. Circular interpolation control with center point designation (INC, CCW)</li> <li>13H: VF2 2-axis speed control (Forward)</li> <li>14H: VR2 2-axis linear interpolation control (INC)</li> <li>17H: FEED3 Fixed-feed control by 3-axis linear interpolation</li> <li>18H: VF3 3-axis linear interpolation control (INC)</li> <li>17H: FEED3 Fixed-feed control by 4-axis linear interpolation</li> <li>18H: NC4 4-axis linear interpolation control (INC)</li> <li>1CH: FEED4 Fixed-feed control by 4-axis linear interpolation</li> <li>1BH: INC4 4-axis speed control (Reverse)</li> <li>1AH: ABS4 4-axis speed control (Reverse)</li> <li>1AH: ABS4 4-axis speed control (Reverse)</li> <li>1AH: ABS4 4-axis speed control (Reverse)</li> <li>1AH: ADS4 4-axis speed control (Reverse)</li> <li>1AH: ADS4 4-axis speed control (Reverse)</li> <li>1AH: NOP NOP instruction</li> <li>81H:</li></ul>	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. When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled. For example, when 4 is set, 0 is applied.

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Name	Variable name	Data type	Setting range	Description
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. When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled. For example, when 4 is set, 0 is applied.
Da.10: M code	pb_uMcode	Word [unsigned]	<ul> <li>Da.2: Control system = 82H: JUMP instruction</li> <li>0 to 10</li> <li>Da.2: Control system = 83H: LOOP</li> <li>1 to 65535</li> <li>Da.2: Control system = Other than the above</li> <li>0 to 65535</li> <li>(0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)</li> </ul>	Set the condition data No., number of repetitions, or M code for the control system.
Da.9: Dwell time	pb_uDwellTime	Word [unsigned]	<ul> <li>Da.2: Control system = 82H: JUMP instruction</li> <li>1 to 600</li> <li>Da.2: Control system = 82H: Other than JUMP instruction</li> <li>0 to 65535</li> <li>(0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)</li> </ul>	Set the positioning data No. or dwell time for the control system.
Da.27: M code ON signal output timing	pb_uMcodeOnTimin g	Word [unsigned]	0: Setting value of Pr.18 M code ON signal output timing 1: WITH mode 2: AFTER mode	Set the timing to output the M code ON signal. When 4 or higher is specified, bit 0 and 1 are enabled. For example, when 4 is set, 0 is applied.
Da.28: ABS direction in degrees	pb_uABS	Word [unsigned]	<ul> <li>0: Setting value of Cd.40 ABS direction in degrees</li> <li>1: ABS circular right</li> <li>2: ABS circular left</li> <li>3: Takes a shortcut. (Specified direction ignored.)</li> </ul>	Set the movement direction of ABS when the unit is degree under position control. When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled. For example, when 4 is set, 0 is applied.
Da.29: Interpolation speed designation method	pb_uInterpolateSpd	Word [unsigned]	<ul> <li>0: Setting value of Pr.20 Interpolation speed designation method.</li> <li>1: Composite speed</li> <li>2: Reference axis speed</li> </ul>	Set whether to specify the composite speed or reference axis speed when performing liner interpolation or circular interpolation. When 8 or higher is specified, bit 0, 1, and 2 are enabled. For example, when 8 is set, 0 is applied.
Da.8: Command speed	pb_udCmdSpd	Double word [unsigned]	Pr.1: Unit setting = 0, 1, 2 • 1 to 2,000,000,000 Pr.1: Unit setting = 3 • 1 to 5,000,000	Set the command speed for positioning.
			FFFFFFFH: Current speed (Speed set for the previous positioning data No.)	The speed set for the previous positioning data No. is used for positioning control.

Name	Variable name	Data type	Setting range	Description
Da.6: Positioning address	pb_dPositAdr	Double word [signed]	Pr.1: Unit setting = 0, 1, 3         • Da.2: Control system = 06H to 09H: 0 to 2,147,483,647         Pr.1: Unit setting = 0, 1, 3         • Da.2: Control system = Other than 06H to 09H: - 2,147,483,648 to 2,147,483,647         Pr.1: Unit setting = 2         • Da.2: Control system = 01H, 0AH, 15H, 1AH, 81H, 20H, 22H, 23H: 0 to 35,999,999         Pr.1: Unit setting = 2         • Da.2: Control system = 02H, 0BH, 16H, 1BH, 03H, 0CH, 17H, 1CH, 20H, 22H, 23H: -2,147,483,648 to 2,147,483,647         Pr.1: Unit setting = 2         • Da.2: Control system = 06H, 07H: 0 to 2,147,483,647 (INC mode), 0 to 35,999,999 (ABS mode)         Pr.1: Unit setting = 2         • Da.2: Control system = 08H, 09H: 0 to 2,147,483,647	Specify the target position or movement amount for positioning control. The setting value differs depending on the control system.
Da.7: Arc address	pb_dArcAdr	Double word [signed]	Pr.1: Unit setting = 0, 1, 3 • -2,147,483,648 to 2,147,483,647 Pr.1: Unit setting = 2 • Unused (Set 0.)	Use this label only when performing circular interpolation control. For the control with sub point designation, set the sub point address. For the control with center point designation, set the center point address of the arc.
Da.20: Axis to be interpolated No. 1	pb_uInterpolatedAx No1	Word [unsigned]	0H: Axis 1 1H: Axis 2 2H: Axis 3 3H: Axis 4 4H: Axis 5 5H: Axis 6 6H: Axis 7 : EH: Axis 15 FH: Axis 15 FH: Axis 16	Set the interpolation-target axis 1 when performing interpolation operation. Values out of the setting range or the own axis cannot be set as the interpolation- target axis. Set 0 to disable the interpolation. When 100H or higher is set, lower 8 bits (bit 0 to 7) are enabled. For example, when 101H is set, 1H is applied.
Da.21: Axis to be interpolated No. 2	pb_uInterpolatedAx No2	Word [unsigned]	0H: Axis 1 1H: Axis 2 2H: Axis 3 3H: Axis 4 4H: Axis 5 5H: Axis 6 6H: Axis 7 : EH: Axis 15 FH: Axis 16	Set the interpolation-target axis 2 when performing interpolation operation. Values out of the setting range or the own axis cannot be set as the interpolation- target axis. Set 0 to disable the interpolation or for 2-axis interpolation control. When 100H or higher is set, lower 8 bits (bit 0 to 7) are enabled. For example, when 101H is set, 1H is applied.

Name	Variable name	Data type	Setting range	Description
Da.22: Axis to be interpolated No. 3	pb_uInterpolatedAx No3	Word [unsigned]	0H: Axis 1 1H: Axis 2 2H: Axis 3 3H: Axis 4 4H: Axis 5 5H: Axis 6 6H: Axis 7 : EH: Axis 15 FH: Axis 16	Set the interpolation-target axis 3 when performing interpolation operation. Values out of the setting range or the own axis cannot be set as the interpolation- target axis. Set 0 to disable the interpolation, for 2-axis interpolation control, or for 3- axis interpolation control. When 100H or higher is set, lower 8 bits (bit 0 to 7) are enabled. For example, when 101H is set, 1H is applied.

Version upgrade history					
Version	Date	Description			
00D	2014/06/30	First edition			

M+RD77\_StartPositioning

#### Function overview Item Description Function overview Starts the positioning operation. Symbol M+RD77 StartPositioning Execution command Execution status B:i bEN o bENO: B Module label DUT : i\_stModule o\_bOK : B Completed without error Target axis UW : i\_uAxis Error flag o bErr : B Cd.3: Positioning UW : i\_uStartNo o uErrld : UW Error code start No. Applicable hardware and Applicable module RD77MS16, RD77MS8, RD77MS4, RD77MS2 software Applicable CPU MELSEC iQ-R series GX Works3 Applicable engineering software Programming language Ladder Number of steps (maximum) 410 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 (Y10 to Y1F). • Only when the conditions are met, the positioning start signal (Y10 to Y1F) is turned ON by turning ON i\_bEN (Execution command). The conditions are the following: RD77 READY (X0) is ON, positioning start signal (Y10 to Y1F) is OFF, start complete signal (Md.31) is OFF, and BUSY signal (X10 to X1F) is OFF. If any of the conditions is not met, the error code 200 (hexadecimal) is stored in o\_uErrld (Error code). • When the start complete signal (Md.31) is turned ON or i\_bEN (Execution command) is turned OFF, the positioning start signal (Y10 to Y1F) 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\_uErrld (Error code). Compiling method Macro type FB operation type Pulsed execution (multiple scan execution type)

ltem	Description	
Timing chart	When operation completes without an error	r
	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_uErrld (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_uErrld (Error code)	0 Error code 0
Restrictions and precautions	<ul> <li>the required system operation.</li> <li>The FB cannot be used in an interrupt p</li> <li>Ensure that i_bEN (Execution command that are only executed once such as a s turned OFF.</li> <li>This FB turns ON and OFF the positioni (Y10 to Y1F) by the other means while</li> <li>When this FB is used twice or more or interlock to prevent the FBs from being</li> <li>When this FB is used twice or more pla signal being operated by the module late</li> </ul>	d) is capable of being turned OFF by the program. Do not use this FB in programs subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be ng start signal (Y10 to Y1F). Thus, do not turn ON or OFF the positioning start sign this FB is being executed. bother FB that operates the Y signal same as the signal this FB does, create an activated at the same time. eccaution must be taken to avoid repetition of the target axis. aces, a duplicated coil warning may occur during compile operation due to the Y bel. However, this is not a problem and the FB will operate without an error. ted. Data required for controlling the start No. must be set on the parameter or buff

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 16.	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. • RD75 READY: On • Positioning start signal: Off • Start complete signal: Off • BUSY signal: Off	Execute the FB when all of the following conditions are met. • RD75 READY: On • Positioning start signal: Off • Start complete signal: Off • BUSY signal: Off

### ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_JOG

#### **Function overview** Description Item Function overview Performs the JOG operation or inching operation. Symbol M+RD77\_JOG Execution command B:i\_bEN o bENO: B Execution status Module label DUT : i\_stModule Completed without error o bOK: B Error flag o\_bErr : B Target axis UW : i\_uAxis Forward run JOG command B:i\_bFJog o\_uErrld : UW Error code Reverse run JOG command B: i\_bRJog Cd.17: JOG speed UD : i\_udJogSpeed Cd.16: Inching movement amount -UW : i\_uInching RD77MS16, RD77MS8, RD77MS4, RD77MS2 Applicable hardware and Applicable module software Applicable CPU MELSEC iQ-R series Applicable engineering software GX Works3 Programming language Ladder Number of steps (maximum) 384 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\_uErrld (Error code). Compiling method Macro type FB operation type Real-time execution

Item	Description				
Timing chart	When operation completes w	vithout an error			
	i bEN				
	(Execution command)	└── <sup>′</sup> ∕ .	<u></u>		
	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_ben (enormag)				
	o_uErrld (Error code)		0		
	When an error occurs				
	i_bEN		<b>y</b>		
	(Execution command)				
	o_bENO (Execution status)				
	JOG operation		Standby		
	o_bOK	λ	<u>\</u>		
	(Completed without error)	│			
	o_bErr (Error flag)	· · · · · · · · · · · · · · · · · · ·	\		
	o_uErrld (Error code)	0	Error code 0		
Restrictions and precautions	the required system opera • The FB cannot be used in • Ensure that i_bEN (Execution)	tion. an interrupt program. tion command) is capable of t	gram the error recovery processing separately in accordance with eing turned OFF by the program. Do not use this FB in programs		
	<ul> <li>that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF.</li> <li>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.</li> <li>When this FB is used twice or more or other FB that operates the Y signal same as the signal this FB does, create an the based twice or more or other FB that operates the Y signal same as the signal this FB does, create an the signal this FB does.</li> </ul>				
	<ul><li>interlock to prevent the FBs from being activated at the same time.</li><li>When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.</li></ul>				
	<ul> <li>When this FB is used twice or more, precaution must be taken to avoid repetition or the target axis.</li> <li>Setting a large value for the JOG speed from the beginning is dangerous. For the safety, set a small value first, and increase</li> </ul>				
	the value gradually while checking the operation to determine the value optimal for the control.				
	<ul> <li>When values other than 0 are set in both i_ulnching (Cd.16: Inching movement amount) and i_udJogSpeed (Cd.17: JOG speed), inching operation is performed.</li> </ul>				
	<ul> <li>When this FB is used in two or more places, a duplicated coil warning may occur during compile operation due to the Y</li> </ul>				
			s is not a problem and the FB will operate without an error.		
	<ul> <li>Every input must be provid</li> </ul>	led with a value for proper FB	operation.		
Error codes					
Error code	Description		Action		
100 (Hexadecimal)		ue of i_uAxis (Target axis) is e. The target axis is not e of 1 to 16.	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.)		

#### ■Input labels Variable name Setting range Description Name Data type i\_bEN Execution Bit ON, OFF ON: The FB is activated. command OFF: The FB is not activated. Module label i\_stModule Structure The setting range differs Specify the module label of the MELSEC iQ-R simple depending on the motion module. module label. Target axis Word [unsigned] Specify the axis number. i\_uAxis 1 to 16 The setting range differs depending on the module used. Forward run JOG i\_bFJog Bit ON, OFF Turn ON this label when performing the forward run JOG command operation or forward run inching operation. Reverse run JOG i\_bRJog Bit ON, OFF Turn ON this label when performing the reverse run JOG command operation or reverse run inching operation. Cd.17: JOG speed i\_udJogSpeed Double word Pr.1: Unit setting = mm Specify the JOG speed. [unsigned] • 0 to 200000000 For inching operation, set 0. Pr.1: Unit setting = inch • 0 to 200000000 Pr.1: Unit setting = degree • 0 to 200000000 Pr.1: Unit setting = pulse • 0 to 100000000 Cd.16: Inching 0 to 65535 i\_uInching Word [unsigned] Specify the inching movement amount. movement amount 0: JOG operation For JOG operation, set 0. (0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.)

#### ■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_uErrld	Word [unsigned]	0	The generated error code is stored.

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_MPG

#### **Function overview** Description Item Function overview Performs the manual pulse generator operation. Symbol M+RD77\_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\_uErrld : UW Error code 1 pulse input magnification Applicable hardware and Applicable module RD77MS16, RD77MS8, RD77MS4, RD77MS2 software Applicable CPU MELSEC iQ-R series GX Works3 Applicable engineering software Programming language Ladder Number of steps (maximum) 336 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_uErrld (Error code)
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	o_bOK (Completed without error) o_bErr (Error flag)
	o_uErrld (Error code) 0 Error code 0
Restrictions and precautions	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>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.</li> <li>Do not change i_uAxis (Target axis) while i_bEN (Execution command) is ON.</li> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>

#### 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 16.	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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
Cd.20: Manual pulse generator 1 pulse input magnification	i_udMPGInputMagnifi cation	Double word [unsigned]	1 to 10,000	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.

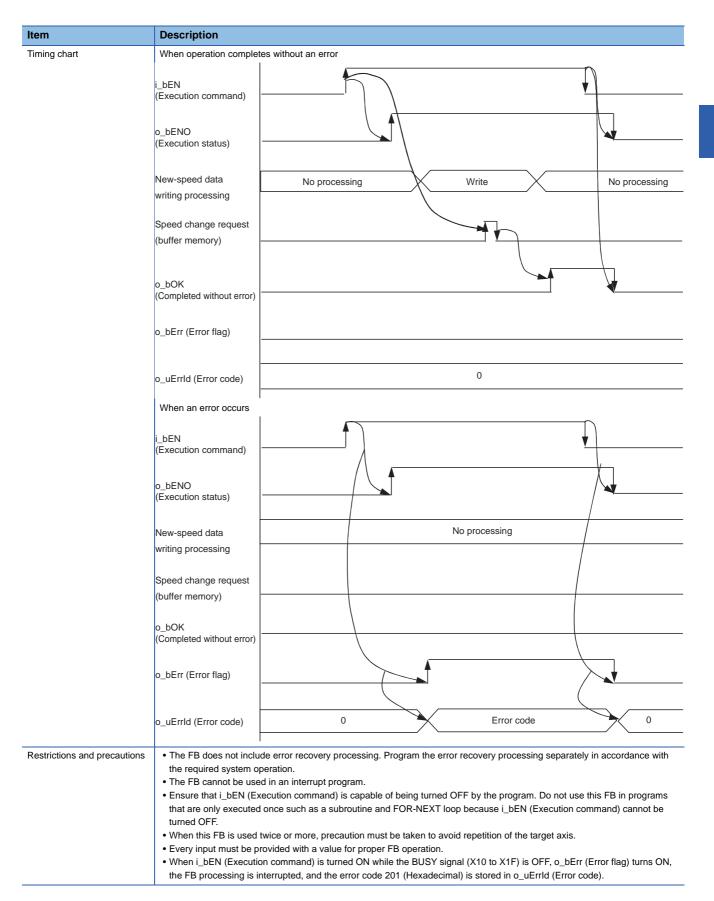
#### ■Output labels

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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_ChangeSpeed

Function overvie	W			
Item	Description			
Function overview	Changes the speed.			
Symbol				
		M+RD77_ChangeSpee	ed	
	Execution command ——B : i_b	EN	o_bENO : B Execution status	
	Module labelDUT : i	_stModule	o_bOK : B Completed without error	
	Target axis UW : i_	uAxis	o_bErr : B —— Error flag	
	Cd.14: New speed value UD : i_	udSpeedChangeValue	o_uErrld : UW	
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77M	S4, RD77MS2	
software	Applicable CPU	MELSEC iQ-R series		
	Applicable engineering software	GX Works3		
Programming language	Ladder			
Number of steps (maximum)	210 steps	210 steps		
Function description	<ul> <li>By turning ON i_bEN (Execution command), the speed used for the control is changed to a new speed.</li> <li>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_uErrld (Error code).</li> </ul>			
Compiling method	Macro type			
FB operation type	Pulsed execution (multiple scan execution	ition type)		



2

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 16.	Please try again after confirming the setting.		
201 (Hexadecimal)	This FB is executed before positioning operation starts.	Please try again during positioning operation.		

#### ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
Cd.14: New speed value	i_udSpeedChangeValue	Double word [unsigned]	Pr.1: Unit setting = mm • 0 to 200000000 Pr.1: Unit setting = inch • 0 to 200000000 Pr.1: Unit setting = degree • 0 to 200000000 Pr.1: Unit setting = pulse • 0 to 100000000	Set a new speed.

#### ■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_uErrld	Word [unsigned]	0	The generated error code is stored.

Version	Date	Description
00D	2014/06/30	First edition

#### M+RD77\_ChangeAccDecTime

#### **Function overview**

Item	Description					
Function overview	Changes the acceleration/deceleration time at a speed change.					
Symbol						
	M+RD77_ChangeAccDecTime					
	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		
	Acceleration/deceleration time	B : i_bEnable	o_uErrld : UW -	—— Error code		
	Cd.10: New acceleration time —— value	UD : i_udNewAccelerationTime				
	Cd.11: New deceleration time	UD : i_udNewDecelerationTime				
Applicable hardware and	Applicable module RD77MS16, RD77MS8, RD77MS4, RD77MS2					
software	Applicable CPU	MELSEC iQ-R series				
	Applicable engineering software	GX Works3				
Programming language	Ladder					
Number of steps (maximum)	212 steps					
Function description	<ul> <li>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 during speed change, enable/ disable selection is changed to 1: Enables modifications to acceleration/deceleration time value) and i_udNewDeceleration/ deceleration/ deceleration time change enabled flag) is OFF, i_udNewAccelerationTime (Cd.10: New acceleration time value) and i_udNewDeceleration time (Cd.11: New deceleration time value) are not set and Cd.12: Acceleration/deceleration time value) and i_udNewDecelerationTime (Cd.11: New deceleration time value) are not set and Cd.12: Acceleration/deceleration time change during speed change, enable/disable selection is changed to 0: Disables modifications to acceleration/ deceleration time.</li> <li>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_uErrld (Error code).</li> </ul>					
Compiling method	Macro type					
FB operation type	Pulsed execution (single scan execution	on type)				

Item	Description	
Timing chart	When operation completes without an error • (When Cd.12: Acceleration/deceleration time	e change during speed change, enable/disable selection 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 enabled or disabled	Disabled Enabled Disabled
	o_bOK (Completed without error)	
	o_bErr (Error flag)	
	o_uErrld (Error code)	0
	(When Cd.12: Acceleration/deceleration time	I e change during speed change, enable/disable selection 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 Acceleration/deceleration time change enabled or disabled	Current value Enabled Disabled
	o_bOK (Completed without error)	<u> </u>
	o_bErr (Error flag)	
	o_uErrld (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 Acceleration/deceleration time change enabled or disabled	Current value Disabled
	o_bOK (Completed without error)	
	o_bErr (Error flag)	
	o_uErrld (Error code)	0 Error code 0

Item	Description
Restrictions and precautions	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>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.</li> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.</li> <li>A duplicated coil warning may occur during compile operation. However, this is not a problem and the FB will operate without an error.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>

#### 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 16.	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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
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_udNewAcceleratio nTime	Double word [unsigned]	0 to 8,388,608 (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_udNewDeceleratio nTime	Double word [unsigned]	0 to 8,388,608 (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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description		
00D	2014/06/30	First edition		

M+RD77\_ChangePosition

#### **Function overview**

Item	Description				
Function overview	Changes the target position.				
Symbol					
		M+RD77_Change	ePosition		
	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.27: Target position change —— value (New address)	D : i_dTargetNewPosition	o_uErrld : UW —	— Error code	
	Cd.28: Target position change —— value (New speed)	UD : i_udTargetNewSpeed			
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77M	1S4, RD77MS2		
software	Applicable CPU	MELSEC iQ-R series			
	Applicable engineering software	GX Works3			
Programming language	Ladder	- 1			
Number of steps (maximum)	254 steps				
Function description	<ul> <li>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.</li> <li>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).</li> </ul>				
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)	
	Cd.27: Target position change value (New address)	Current value New value
	Cd.28: Target position	Current value New value
	change value (New speed) o_bOK	
	(Completed without error)	
	o_bErr (Error flag)	
	o_uErrld (Error code)	0
	When an error occurs	
	i_bEN (Execution command)	
	o_bENO (Execution status)	
	Cd.27/Cd.28:	Current value
	Target position change value	
	o_bOK (Completed without error)	
	o_bErr (Error flag)	
	o_uErrld (Error code)	0 Error code 0
Restrictions and precautions	<ul> <li>the required system operation.</li> <li>The FB cannot be used in an interru</li> <li>Ensure that i_bEN (Execution comm that are only executed once such as turned OFF.</li> <li>When this FB is used twice or more</li> <li>Every input must be provided with a</li> <li>When i_bEN (Execution command)</li> </ul>	hand) is capable of being turned OFF by the program. Do not use this FB in programs s a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be precaution must be taken to avoid repetition of the target axis.

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 16.	Please try again after confirming the setting.		
201 (Hexadecimal)	This FB is executed before positioning operation starts.	Please try again during positioning operation.		

#### ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
Cd.27: Target position change value (New address)	i_dTargetNewPositi on	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_udTargetNewSpee d	Double word [unsigned]	Pr.1: Unit setting = mm • 0 to 200000000 Pr.1: Unit setting = inch • 0 to 200000000 Pr.1: Unit setting = degree • 0 to 200000000 Pr.1: Unit setting = pulse • 0 to 100000000	Set the new speed when changing the target position during positioning operation. When 0 is set, the speed is not 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 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_uErrld	Word [unsigned]	0	The generated error code is stored.

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_Restart

#### **Function overview** Description Item Function overview Restarts the axis being stopped. Symbol M+RD77\_Restart B : i\_bEN Execution command o\_bENO : B Execution status DUT : i\_stModule Module label o\_bOK : B Completed without error W : i\_uAxis Target axis o\_bErr : B Error flag o\_uErrld : UW Error code RD77MS16, RD77MS8, RD77MS4, RD77MS2 Applicable hardware and Applicable module software Applicable CPU MELSEC iQ-R series Applicable engineering software GX Works3 Programming language Ladder Number of steps (maximum) 263 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 (Md.31: Status) 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\_uErrld (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)
	Restart command
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (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_uErrld (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.
	<ul> <li>The FB cannot be used in an interrupt program.</li> <li>Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in program: that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF.</li> </ul>
	<ul> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>

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 16.	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	<ul><li>Please try again after confirming the setting.</li><li>Positioning complete signal: Off</li><li>Axis operation status: Stop</li></ul>		

### ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.

#### ■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_uErrld	Word [unsigned]	0	The generated error code is stored.

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_OperateError

#### **Function overview** Description Item Function overview Monitors errors and warnings, and resets errors. Symbol M+RD77\_OperateError Execution command B : i\_bEN o\_bENO : B Execution status DUT : i\_stModule Module label o\_bOK : B Completed without error UW : i\_uAxis o\_bModuleErr : B Axis error detection Target axis 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 Applicable module RD77MS16, RD77MS8, RD77MS4, RD77MS2 software Applicable CPU MELSEC iQ-R series Applicable engineering software GX Works3 Programming language Ladder Number of steps (maximum) 407 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\_uModuleErrld (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\_uErrld (Error code). Compiling method Macro type FB operation type Real-time execution

ltem	Description
Timing chart	When operation completes without an error
	(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)
	0 Error code
	(Axis error code)
	o_bModuleWarn
	(Axis warning detection)
	o_uModuleWarnId 0 Warning code 0
	(Axis warning code)
	(Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code)
	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)
	o_bModuleWarn
	(Axis warning detection)
	0_uModuleWarnId 0
	(Axis warning code)
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0 Error code 0
ostrictions and procession	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with</li> </ul>
estrictions and precaution	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> </ul>
	• The FB cannot be used in an interrupt program.
	<ul> <li>Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in programs</li> </ul>
	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.

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 16.	Please try again after confirming the setting.		

#### ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
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_uErrld	Word [unsigned]	0	The generated error code is stored.

Version	Date	Description	
00D	2014/06/30	First edition	

#### M+RD77\_InitializeParameter

Function overview	w			
Item	Description			
Function overview	Initializes the parameter.			
Symbol		M+RD77_InitializeParameter		
	Execution command ——B : i_bEN	o_bENO : B Execution status		
	Module labelDUT : i_stM	Iodule o_bOK : B Completed without error		
		o_bErr : B ——— Error flag		
		o_uErrId : UW Error code		
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4, RD77MS2		
software	Applicable CPU	MELSEC iQ-R series		
	Applicable engineering software	GX Works3		
Programming language	Ladder			
Number of steps (maximum)	45 steps			
Function description	By turning ON i_bEN (Execution command), the setting data stored in the buffer memory and the flash ROM of the RD77 is reset to the factory setting.			
Compiling method	Macro type			
FB operation type	Pulsed execution (multiple scan executi	ion type)		
Timing chart	i_bEN (Execution command) o_bENO (Execution status) Cd.2: Module initialization req o_bOK (Completed without e o_bErr (Error flag) o_uErrld (Error code)			
Restrictions and precautions	<ul> <li>the required system operation.</li> <li>The FB cannot be used in an interrup</li> <li>Ensure that i_bEN (Execution comma that are only executed once such as a turned OFF.</li> <li>Every input must be provided with a v</li> <li>Before using this FB, make sure that</li> </ul>	and) is capable of being turned OFF by the program. Do not use this FB in programs a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be value for proper FB operation.		

Error codes		
Error code	Description	Action
None	None	None

#### ■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-R 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_uErrld	Word [unsigned]	0	Always 0

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_WriteFlash

Function overviev	W			
Item	Description			
Function overview	Writes the parameter, positioning data, and block start data in the buffer memory to the flash ROM.			
Symbol		M+RD77_WriteFlash		
	Execution commandB : i_bEN	o_bENO : B Execution status		
	Module label —— DUT : i_st	Module o_bOK : B Completed without error		
		o_bErr : B ——— Error flag		
		o_uErrld : UW Error code		
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4, RD77MS2		
software	Applicable CPU	MELSEC iQ-R series		
	Applicable engineering software GX Works3			
Programming language	Ladder			
Number of steps (maximum)	45 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 executi	ion type)		
Timing chart	i_bEN (Execution command) o_bENO (Execution status) Cd.1: Flash ROM writing req o_bOK (Completed without o o_bErr (Error flag) o_uErrld (Error code)			
Restrictions and precautions	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance wit the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>Ensure that i_bEN (Execution command) is capable of being turned OFF by the program. Do not use this FB in program that are only executed once such as a subroutine and FOR-NEXT loop because i_bEN (Execution command) cannot be turned OFF.</li> <li>Every input must be provided with a value for proper FB operation.</li> <li>Before using this FB, make sure that the PLC READY signal (Y0) is OFF.</li> </ul>			

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-R 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_uErrld	Word [unsigned]	0	Always 0

Version	Date	Description
00D	2014/06/30	First edition

### M+RD77\_ChangeServoParameter

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Lun	otion.	overview
FUH	CLIUII	

Item	Description			
Function overview	Changes the servo parameter after the amplifier is activated.			
Symbol				1
		M+RD77_ChangeServoParamet	ter	
	Execution command ——B : i_bEN	J	o_bENO : B	—— Execution status
	Module label DUT : i_s	stModule	o_bOK : B	——— Completed without error
	Target axis ——UW : i_u	Axis	o_bErr : B	Error flag
	Cd.131: Parameter No. —— UW : i_u	UW : i_uParameterNo.		Error code
	Cd.132: Change data —— D : i_dCł	nangeValue		
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4,	RD77MS2	
software	Applicable CPU	MELSEC iQ-R series		
	Applicable engineering software	GX Works3		
Programming language	Ladder			
Number of steps (maximum)	236 steps			
Function description	<ul> <li>By turning ON i_bEN (Execution command), the servo parameter after the amplifier is started is changed.</li> <li>When the target axis of the input label is incorrectly set, o_bErr turns ON and the error code is stored in o_bErrld.</li> </ul>			
Compiling method	Macro type			
FB operation type	Pulsed execution (multiple scan execut	ion 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_uErrld (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_uErrld (Error code)	0 Error code 0			
Restrictions and precautions	The FB does not include error recovery proces     the required system operation.	ssing. Program the error recovery processing separately in accordance with			
	The FB cannot be used in an interrupt program	n.			
	• 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 of	on the module used in the system.			

Error	codes
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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 16.	Please try again after confirming the setting.

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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
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 HOOPArameter No. setting 01h to 40h Parameter group 0: Writing mode 0: Writing to the RAM 1: PB group 2: PC group 3: PD group 4: PE group 5: PF group 9: PO group A: PS group B: PL group C: PT group
Cd.132: Change data	i_dChangeValue	Double word [signed]	Refer to the Servo Amplifier Instruction	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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

### M+RD77\_ChangeTorqueControlMode

Item	Description					
Function overview	Activates the torque control mode.					
Symbol		M+RD77_ChangeTor	queControlMode			
	Execution command ——	B : i_bEN	o_bENO : B	Execution status		
	Module label ——	DUT : i_stModule	о_bOK : В —	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_uErrld : UW	Error code		
	Cd.144: Torque time constant at torque control mode —— (Forward direction) Cd.145: Torque time constant	-UW : i_uTorqueTimeConstDrivin	ngMode			
	at torque control mode — (Negative direction)	-UW : i_uTorqueTimeConstRege	nerativeMode			
	Cd.146: Speed limit value at torque control mode	UD : i_udSpeedLimit				
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD	077MS4. RD77MS2			
software	Applicable CPU	MELSEC iQ-R series	MELSEC iQ-R series			
	Applicable engineering software	GX Works3	GX Works3			
Programming language	Ladder	I				
Number of steps (maximum)	347 steps					
Function description	<ul> <li>By turning ON i_bEN (Execution</li> <li>When this FB is executed under</li> <li>When the setting value of the tar and the error code 100 (Hexaded)</li> </ul>	torque control, the command torqu	ue and speed limit value are o r (Error flag) turns ON, the FE	changed.		
Compiling method	Macro type					
FB operation type	Pulsed execution (multiple scan ex	ecution type)				

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
	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	No processing
	request writing	
	Servo status control mode	Currently activated control mode
	o_bOK (Completed without error)	
	o_bErr (Error flag)	
	o_uErrld (Error code)	0 Error code 0
Restrictions and precautions	<ul> <li>the required system operation.</li> <li>The FB cannot be used in an interrupt progr</li> <li>Ensure that i_bEN (Execution command) is that are only executed once such as a subro turned OFF.</li> <li>When this FB is used twice or more, precau</li> <li>Every input must be provided with a value for</li> </ul>	capable of being turned OFF by the program. Do not use this FB in programs butine and FOR-NEXT loop because i_bEN (Execution command) cannot be tion must be taken to avoid repetition of the target axis.
Error codes		
Error code	Description	Action
100 (Hexadecimal)	The setting value of i_uAxis (Tar out of the range. The target axis within the range of 1 to 16.	

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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
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 • 0 to 200000000 Pr.1: Unit setting = inch • 0 to 200000000 Pr.1: Unit setting = degree • 0 to 200000000 Pr.1: Unit setting = pulse • 0 to 100000000	Set the speed limit value at torque control mode.

# ■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 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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description			
00D	2014/06/30	First edition			

### M+RD77\_ChangeSpeedControlMode

Item	Description					
Function overview	Activates the speed control mode.					
Symbol		-				
			M+RD77_ChangeSpeedCon	trolMode		
	Execution command	B : i_bEN		o_bENO : B	Execution status	
	Module label	DUT : i_st	Module	o_bOK : B	Completed without erro	
	Target axis	UW : i_uA	xis	o_bErr : B —	Error flag	
	Cd.140: Command speed at speed control mode	D : i_dCor	nmandSpeed	o_uErrld : UW	Error code	
	Cd.141: Acceleration time at speed control mode	UW : i_uS	peedAccelerationTime			
	Cd.142: Deceleration time at speed control mode	UW : i_uS	peedDecelerationTime			
Applicable hardware and	Applicable module		RD77MS16, RD77MS8, RD77	 MS4, RD77MS2		
software	Applicable CPU		MELSEC iQ-R series			
	Applicable engineering softw	are	GX Works3			
Programming language	Ladder		1			
Number of steps (maximum)	303 steps					
Function description	<ul> <li>By turning ON i_bEN (Execution command), the speed control mode is activated for the specified axis.</li> <li>When this FB is executed under speed control, the command speed is changed.</li> <li>When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupt and the error code 100 (Hexadecimal) is stored in o_uErrld (Error code).</li> </ul>					
Compiling method	Macro type					
FB operation type	Pulsed execution (multiple se	can executi	on type)			

ltem	Description	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 Speed control mode activated					
	Servo status control mode	Speed control mode activated					
	o_bOK (Completed without error)						
	o_bErr (Error flag)						
	o_uErrld (Error code)	0					
	0_02/01/03/05/05/05/05/05/05/05/05/05/05/05/05/05/						
	When an error occurs						
	i_bEN (Execution command)						
	o_bENO (Execution status)						
	Control mode switching	No processing					
	request writing						
	Servo status control mode	Currently activated control mode					
	o_bOK (Completed without error)						
	o_bErr (Error flag)						
	o_uErrld (Error code)	0 Error code 0					
estrictions and precautions	The FB does not include error recovery proces	ssing. Program the error recovery processing separately in accordance v					
	the required system operation.						
	• The FB cannot be used in an interrupt program						
		apable of being turned OFF by the program. Do not use this FB in progra tine and FOR-NEXT loop because i_bEN (Execution command) cannot t					
	turned OFF.						
		on must be taken to avoid repetition of the target axis.					
	• Every input must be provided with a value for p						
	When this FB fails switching the mode, o_bOK	(Completed without error) does not turn ON.					
rror codes							
rror code	Description	Action					
	Decemption						

The setting value of i\_uAxis (Target axis) is

out of the range. The target axis is not within the range of 1 to 16.

Please try again after confirming the setting.

100 (Hexadecimal)

# ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
Cd.140: Command speed at speed control mode	i_dCommandSpeed	Double word [signed]	Pr.1: Unit setting = mm • -200000000 to +200000000 Pr.1: Unit setting = inch • -2000000000 to +200000000 Pr.1: Unit setting = degree • -2000000000 to +200000000 Pr.1: Unit setting = pulse • -1000000000 to +100000000	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.

## ■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 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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description			
00D	2014/06/30	First edition			

### M+RD77\_ChangePositionControlMode

Item	Description					
Function overview	Activates the position control mode.					
Symbol		M+RD77_Chang	ePositionControlMode			
	Execution command ——B :	_bEN	o_bENO : B	Execution status		
	Module labelDU	Γ:i_stModule	o_bOK : B	Completed without error		
	Target axis UW	: i_uAxis	o_bErr : B	Error flag		
			o_uErrld : UW	Error code		
Applicable hardware and	Applicable module	RD77MS16, RD7	7MS8, RD77MS4, RD77MS2			
software	Applicable CPU	MELSEC iQ-R se	eries			
	Applicable engineering software	GX Works3				
Programming language	Ladder	•				
Number of steps (maximum)	347 steps					
Function description	<ul> <li>By turning ON i_bEN (Execution</li> <li>When this FB is executed during</li> <li>When the setting value of the ta and the error code 100 (Hexade)</li> </ul>	position control, the ex get axis is out of the rar	ecution is completed without any p nge, o_bErr (Error flag) turns ON, t	processing.		
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)					
	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_uErrld (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_uErrld (Error code)	0 Error code 0				
Restrictions and precautions	<ul> <li>the required system operation.</li> <li>The FB cannot be used in an interrupt program</li> <li>Ensure that i_bEN (Execution command) is can that are only executed once such as a subrout turned OFF.</li> </ul>	apable of being turned OFF by the program. Do not use this FB in programs tine and FOR-NEXT loop because i_bEN (Execution command) cannot be on must be taken to avoid repetition of the target axis. proper FB operation.				
Error codes						
Error code	Description	Action				
100 (Hexadecimal)	The setting value of i_uAxis (Targe out of the range. The target axis is within the range of 1 to 16.					

## ■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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	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 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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_ChangeContinuousTorqueMode

Item	Description				
Function overview	Activates the continuous operation to torque control mode.				
Symbol		orque control mode.			
Cymbol		M+RD77_ChangeCor	ntinuousTorqueMode		
	Execution command ——	– B : i_bEN	o_bENO : B	— Execution status	
	Module label ——	DUT : i_stModule	o_bOK : B	— Completed without erro	
	Target axis ——	UW : i_uAxis	o_bErr : B	Error flag	
	Cd.147: Speed limit value at continuous operation to —— torque control mode	D : i_dSpeedLimit	o_uErrld : UW —	— Error code	
	Cd.148: Acceleration time at continuous operation to —— torque control mode	- UW : i_uSpeedAcceleration	Time		
	Cd.149: Deceleration time at continuous operation to —— torque control mode	UW : i_uSpeedDeceleratior	nTime		
Cd.150: Target torque at continuous operation to       W : i_wCommandTorque         torque control mode       W : i_uTorqueTimeConstDrivingMod         Cd.151: Torque time constant at continuous operation to torque       UW : i_uTorqueTimeConstDrivingMod         control mode (Forward direction)       UW : i_uTorqueTimeConstDrivingMod					
		UW : i_uTorqueTimeConstI	DrivingMode		
	Cd.152: Torque time constant at continuous operation to torque —— control mode (Negative direction)	UW : i_uTorqueTimeConst	RegenerativeMode		
	Cd.153: Control mode auto-shift selection	- UW : i_uAutoSwitchingMod	e		
	Cd.154: Control mode auto-shift parameter	D : i_dAutoSwitchingParam	eter		
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RI	D77MS4, RD77MS2		
software	Applicable CPU	MELSEC iQ-R series			
	Applicable engineering software	GX Works3			
Programming language	Ladder				
Number of steps (maximum)	523 steps				
Function description	<ul> <li>By turning ON i_bEN (Execution command), the continuous operation to torque control mode is activated for the specified axis.</li> <li>When this FB is executed during continuous operation to torque control mode, the speed limit value and target torque are changed.</li> <li>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_uErrld (Error code).</li> </ul>				
Compiling method	Macro type				
FB operation type	Pulsed execution (multiple scan execution type)				

tem	Description	
iming chart	When operation completes without an error	
	• When the control mode auto-shift selection is	s set to 0
	i_bEN (Execution command)	
	o_bENO (Execution status)	
	Control mode switching	
	request writing	No processing X Write X No processing
		Continuous operation to torque
	Servo status control mode	Currently activated control mode Continuous operation to torque control mode activated
	o_bOK (Completed without error)	• •
	o_bErr (Error flag)	
	a uFrid (Free anda)	
	o_uErrld (Error code)	0
	When the control mode auto-shift selection is	 soft to other than 0
	- When the control mode auto-shift selection is	
	i_bEN (Execution command)	
	a hENO (Evenution status)	
	o_bENO (Execution status)	
	Control mode switching	No processing Write No processing
	request writing	No processing write no processing
	Feed current value or	Mode switching condition value
	real current value	
	-	
	Servo status control mode	Currently activated control mode
	o_bOK (Completed without error)	<b>↓ ↓</b>
	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	
	Servo status control mode	Currently activated control mode
	o_bOK (Completed without error)	
	o bErr (Error flao)	
	o uErrld (Error code)	0 Error code 0
	o_bOK (Completed without error) o_bErr (Error flag) o_uErrld (Error code)	0 Error code

Item	Description				
Restrictions and precautions	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>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.</li> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.</li> <li>Every input must be provided with a value for proper FB operation.</li> <li>When this FB fails switching the mode, o_bOK (Completed without error) does not turn ON.</li> </ul>				
Error codes					
Error code Description Action		Action			

100 (Hexadecimal)	The setting value of i_uAxis (Target axis) is	Please try again after confirming the setting.
	out of the range. The target axis is not within the range of 1 to 16.	

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-R simple motion module.
Target axis	i_uAxis	Word [unsigned]	1 to 16	Specify the axis number. The setting range differs depending on the module used.
Cd.147: Speed limit value at continuous operation to torque control mode	i_dSpeedLimit	• -200000000 to +200000000 cc		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_uTorqueTimeConstDriving Mode	(0 to 32767: Set by decimal		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_uTorqueTimeConstRegene rativeMode	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 • -2147483648 to +2147483648 Pr.1: Unit setting = inch • -2147483648 to +2147483648 Pr.1: Unit setting = degree • 0 to 35999999 Pr.1: Unit setting = pulse • -2147483648 to +2147483648	Set the condition value when the control mode auto-shift selection is set to 1 or 2.

## ■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 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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

M+RD77\_Sync

#### **Function overview** Description Item Function overview Starts and ends the synchronous control. Symbol M+RD77\_Sync B : i\_bEN Execution command 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\_uErrld : UW - Error code Applicable hardware and Applicable module RD77MS16, RD77MS8, RD77MS4, RD77MS2 software Applicable CPU MELSEC iQ-R series Applicable engineering software GX Works3 Programming language Ladder Number of steps (maximum) 178 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\_uErrld (Error code). • The synchronous control does not start while the READY signal (X0) is OFF, the BUSY signal (X10 to X1F) is ON, or the error detection signal is ON. Compiling method Macro type FB operation type Pulsed execution (multiple scan execution type)

Item	Descriptio	n			
Timing chart	When opera	tion completes without an err	or		
	i_bE	N (Execution command)			
	o_bE	NO (Execution status)			
	Axis	operation status	Standby	Synchror	ious control activated Standby
	o_bC	DK (Completed without error)			
	o_bE	Frr (Error flag)			
	o_uE	Errld (Error code)			0
	When an err	or occurs	1		
	i_bEN	(Execution command)			
	o_bEl	NO (Execution status)			
	Axis	operation status			Standby
	o_bO	K (Completed without error)			
	o_bEi	rr (Error flag)			
	o_uEi	rrld (Error code)	0		Error code 0
Restrictions and precautions	the require • The FB ca • When this	ed system operation. annot be used in an interrupt	program. ecaution must be	taken to avoid	recovery processing separately in accordance with repetition of the output axis No.
Error codes					
Error code		Description		Action	
100 (Hexadecimal)		The output axis No. is not w range.	rithin the setting	Please try ag	ain after confirming the setting.

# ■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-R simple motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 16	Specify the axis number for which synchronous control is started. The setting range differs depending on the module used.

# ■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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

### M+RD77\_ChangeSyncEncoderPosition

Item	Description				
Function overview	Changes the synchronous encoder axis current value and synchronous encoder axis current value per cycle.			cycle.	
Symbol	_				
		M+RD77_ChangeSy	ncEncoderPosition		
	Execution command ——B	: i_bEN	o_bENO : B —	Execution status	
	Module label —— DI	JT : i_stModule	o_bOK : B —	— Completed withou error	
	Synchronous encoder ——U axis No.	𝕂 : i_uSyncEncAxis	o_bErr : B —	— Error flag	
	Cd.320: Synchronous — UN encoder axis control start	N : i_uStartControl	o_uErrld : UW —	— Error code	
	Cd.322: Synchronous — D encoder axis current value setting address	: i_dNewPosition			
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, R	2D77MS4, RD77MS2		
software	Applicable CPU	MELSEC iQ-R series			
	Applicable engineering software	GX Works3	GX Works3		
Programming language	Ladder				
Number of steps (maximum)	215 steps				
Function description	<ul> <li>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 116, the synchronous encoder axis current value is changed by the high speed input request [DI] after i_bEN (Execution command) is turned ON.</li> <li>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_uErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>				
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 No processing 0: Current value change
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous encoder axis control No processing nethod
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (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 wit
	the required system operation.
	• The FB cannot be used in an interrupt program.
	<ul> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>

# 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.	

# ■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-R 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 116: High-speed input start for synchronous encoder axis control (axis 1 to axis 16)	When 1 is set, synchronous encoder axis control is started. When 101 to 116 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal). The setting range differs depending on the module used.
Cd.322: Synchronous encoder axis current value setting address	i_dNewPosition	Double word [signed]	Pr.321: Unit setting = mm • -2147483648 to 2147483647 Pr.321: Unit setting = inch • -2147483648 to 2147483647 Pr.321: Unit setting = degree • -2147483648 to 2147483647 Pr.321: Unit setting = pulse • -2147483648 to 2147483647	Set the new current value after a current value change.

# ■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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

### M+RD77\_DisableSyncEncoder

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Item	Description				
Function overview	Disables inputs from the synchronous encoder axis.				
Symbol					
		M+RD77_DisableSyr	ncEncoder		
	Execution command —— B : i_l	bEN	o_bENO : B —	— Execution status	
	Module label —— DUT	: i_stModule	o_bOK : B —	Completed without error	
	Synchronous encoder — UW : axis No.	i_uSyncEncAxis	o_bErr : B —	— Error flag	
	Cd.320: Synchronous —— UW : encoder axis control start	i_uStartControl	o_uErrld : UW –	—— Error code	
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4, RD77MS2			
software	Applicable CPU	MELSEC iQ-R series			
	Applicable engineering software	GX Works3			
Programming language	Ladder				
Number of steps (maximum)	170 steps				
Function description	<ul> <li>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 116, the synchronous encoder axis counter is disabled by the high speed input request [DI] after i_bEN (Execution command) is turned ON.</li> <li>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_uErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>				
Compiling method	Macro type				
FB operation type	Pulsed execution (single scan executi	on type)			

Item	Descriptio	n		
Timing chart	When opera	tion completes without an error		
	i_bEN	V (Execution command)		
	o_bE	NO (Execution status)		\ ↓
		hronous encoder axis ol method	No proces	sing 1: Counter disable
	o_bO	K (Completed without error)		
	o_bE	rr (Error flag)		
	o_uE	rrld (Error code)		0
	When an err	or occurs		
	i_bE	N (Execution command)		
	o_bE	ENO (Execution status)		
		chronous encoder axis rol method		No processing
	o_b0	OK (Completed without error)		
	o_bE	Err (Error flag)		
	o_uE	ErrId (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 wit 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
		The synchronous encoder axi		Please try again after confirming the setting

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.

# ■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-R 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 116: High-speed input start for synchronous encoder axis control (axis 1 to axis 16)	When 1 is set, synchronous encoder axis control is started. When 101 to 116 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal). The setting range differs depending on the module used.

## ■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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version upgrade history						
Version	Date	Description				
00D	2014/06/30	First edition				

### M+RD77\_EnableSyncEncoder

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Item	Description					
Function overview	Enables inputs from the synchronous encoder axis.					
Symbol						
	Γ		M+RD77_EnableSyncl	Encoder		
	Execution command ——B	: i_bE	EN	o_bENO : B —	— Execution status	
	Module label —— DI	UT : i_	_stModule	o_bOK : B —	— Completed without error	
	Synchronous encoder	W : i_u	uSyncEncAxis	o_bErr : B —	— Error flag	
	Cd.320: Synchronous —— Ut encoder axis control start	W : i_i	uStartControl	o_uErrld : UW —	— Error code	
Applicable hardware and	Applicable module		RD77MS16, RD77MS8, RD77MS4, RD77MS2			
software	Applicable CPU		MELSEC iQ-R series			
	Applicable engineering software		GX Works3			
Programming language	Ladder					
Number of steps (maximum)	170 steps					
Function description	<ul> <li>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 116, the synchronous encoder axis counter is enabled by the high speed input request [DI] after i_bEN (Execution command) is turned ON.</li> <li>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_uErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>					
Compiling method	Macro type					
FB operation type	Pulsed execution (single scan exe	ecution	n type)			

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

# 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.

# ■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-R 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 116: High-speed input start for synchronous encoder axis control (axis 1 to axis 16)	When 1 is set, synchronous encoder axis control is started. When 101 to 116 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal). The setting range differs depending on the module used.

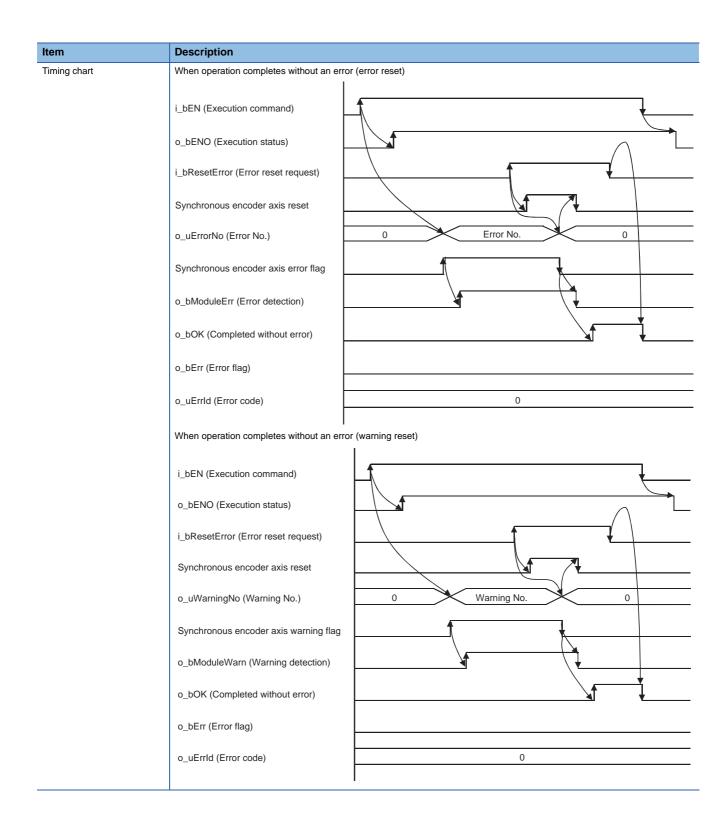
### ■Output labels

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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

### M+RD77\_ResetSyncEncoderError

Item	Description				
Function overview	Reads error information from the synchronous encoder axis, and resets the error.				
Symbol					
			M+RD77_Reset	SyncEncoderError	
	Execution command —	B : i_bEN		o_bENO : B —	— Execution status
	Module label —	DUT : i_st	Module	о_bOK : В —	— Completed without error
	Synchronous — encoder axis No.	—UW : i_uS	yncEncAxis	o_bModuleErr : B —	— Error detection
	Error reset request —	B : i_bRes	setError	o_uErrorNo : UW —	— Error No.
				o_bModuleWarn : B —	— Warning detection
				o_uWarningNo : UW —	— Warning No.
				o_bErr : B —	Error flag
				o_uErrld : UW —	— Error code
Applicable hardware and	Applicable module		RD77MS16, RD77MS	8, RD77MS4, RD77MS2	
software	Applicable CPU		MELSEC iQ-R series		
	Applicable engineering sof	ftware	GX Works3		
Programming language	Ladder				
Number of steps (maximum)	360 steps				
Function description	<ul> <li>By turn ON i_bEN (Execution command), the synchronous encoder axis error and warning information of the synchronous encoder axis No. are read.</li> <li>When the error reset request is ON, the error and warning are reset.</li> <li>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_uErrld (Error code).</li> </ul>				
Compiling method	Macro type				
FB operation type	Real-time execution				



Item	Description	
	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_uErrld (Error code)	0 Error code 0
Restrictions and precautions	the required system operation. • The FB cannot be used in an interrupt program	n must be taken to avoid repetition of the synchronous encoder axis No.

# 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-R simple motion module.
Synchronous encoder axis No.	i_uSyncEncAxis	Word [unsigned]	1 to 4	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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

### M+RD77\_ConnectSyncEncoder

Fun	ction	over	view

Item	Description		
Function overview	Connects a synchronous encoder via CPU.		
Symbol			
		M+RD77_ConnectSyncEncode	r
	Execution commandB : i_bEN		o_bENO : B Execution status
	Module labelDUT : i_st	Module	o_bOK : B Completed without erro
	SynchronousUW : i_uS	syncEncAxis	o_bErr : B —— Error flag
			o_uErrld : UW Error code
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4	, RD77MS2
software	Applicable CPU	MELSEC iQ-R series	
	Applicable engineering software	GX Works3	
Programming language	Ladder	Ladder	
Number of steps (maximum)	176 steps		
Function description	<ul> <li>By turning ON i_bEN (Execution command), the synchronous encoder of the synchronous encoder axis No. is connected v CPU.</li> <li>When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB</li> </ul>		
	processing is interrupted, and the error		
	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_uErrl     (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	1
	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_uErrld (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_uErrld (Error code)	0 Error code 0
Restrictions and precautions	the required system operation.	I essing. Program the error recovery processing separately in accordance with
	<ul> <li>The FB cannot be used in an interrupt progr</li> <li>When this FB is used twice or more, precau</li> <li>Every input must be provided with a value for</li> </ul>	tion must be taken to avoid repetition of the synchronous encoder axis No.

# 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.

# ■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-R simple motion module.
Synchronous encoder axis No.	i_uSyncEncAxis	Word [unsigned]	1 to 4	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_uErr_ld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description				
00D	2014/06/30	First edition				

#### M+RD77\_MoveCamReferencePosition

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.			on to move the cam	
Symbol			M+RD77_MoveCamRefere	ncePosition	
	Execution command ——	B : i_bE	EN	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_dS	SyncCtrlChangeValue	o_uErrld : UW —	— Error code
	Cd.409: Synchronous —— control reflection time	-UW : i_	uSyncCtrlReflectionTime		
Applicable hardware and	Applicable module		RD77MS16, RD77MS8, RD77MS4, RD77MS2		
software	Applicable CPU		MELSEC iQ-R series		
	Applicable engineering software		GX Works3		
Programming language	Ladder				
Number of steps (maximum)	355 steps				
Function description	<ul> <li>By turning ON i_bEN (Execution command), the cam reference position of the output axis No. is moved.</li> <li>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.</li> <li>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_uErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>				
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 0: Cam reference position movement
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous control change No processing
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0 Error code 0
Restrictions and precautions	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No.</li> <li>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.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>

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.				

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# ■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-R simple motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 16	Set the axis number whose cam reference position is to be moved. The setting range differs depending on the module used.
Cd.408: Synchronous control change value	i_dSyncCtrlChangeValue	Double word [signed]	-2147483648 to 2147483647	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.

# ■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_uErr_ld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

#### M+RD77\_ChangeCamPositionPerCycle

Item	Description				
Function overview	Changes the cam axis current value per cycle to a synchronous control change value.				
Symbol			M+RD77_ChangeCamPosit	ionPerCycle	
	Execution command —	B : i_bEN	٧	o_bENO : B —	— Execution status
	Module label —	DUT : i_s	stModule	o_bOK : B —	— Completed without error
	Output axis No. —	— UW : i_u	OutputAxis	o_bErr : B	Error flag
	Cd.408: Synchronous control change value	— D : i_dSy	/ncCtrlChangeValue	o_uErrld : UW —	— Error code
Applicable hardware and	Applicable module		RD77MS16, RD77MS8, RD7	7MS4, RD77MS2	
software	Applicable CPU		MELSEC iQ-R series		
	Applicable engineering software		GX Works3		
Programming language	Ladder				
Number of steps (maximum)	213 steps				
Function description	<ul> <li>By turning ON i_bEN (Execution command), the cam axis current value per cycle of the output axis No. is changed.</li> <li>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_uErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>				
Compiling method	Macro type				
B operation type	Pulsed execution (multiple scan execution type)				

Description
When operation completes without an error
i_bEN (Execution command)
o_bENO (Execution status)
Synchronous control change No processing 1: Change cam axis current value per cycle
Synchronous control change request
o_bOK (Completed without error)
o_bErr (Error flag)
o_uErrld (Error code) 0
When an error occurs
i_bEN (Execution command)
o_bENO (Execution status)
Synchronous control change No processing
Synchronous control change request
o_bOK (Completed without error)
o_bErr (Error flag)
o_uErrld (Error code) 0 Error code 0
I     • 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
<ul> <li>operation cycle or more after o_bOK (Completed without error) of this FB turns ON and before the FBs are executed.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>

Error code	Description	escription 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.					

# ■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-R simple motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 16	Set the axis number whose cam axis current value per cycle is to be changed. The setting range differs depending on the module used.
Cd.408: Synchronous control change value	i_dSyncCtrlChange Value	Double word [signed]	-2147483648 to 2147483647	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).

### ■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_uErr_ld	Word [unsigned]	0	The error code generated in the FB is stored.

Version Date		Description	
00D	2014/06/30	First edition	

M+RD77\_ChangeMainShaftGearPositionPerCycle

Item	Description					
Function overview	Changes the current value per cycle after main shaft gear to a synchronous control change value.					
Symbol						
	M-	RD77_ChangeMainShaftGearPositionPerCycle				
	Execution command ——B : i_bEN	I.	o_bENO : B Execution status			
	Module label —— DUT : i_s	tModule	o_bOK : B Completed without error			
	Output axis No. ——UW : i_u	DutputAxis	o_bErr : B —— Error flag			
	Cd.408: Synchronous — D : i_dSy control change value	ncCtrlChangeValue	o_uErrld : UW Error code			
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4, RD77MS2				
software	Applicable CPU	MELSEC iQ-R series				
	Applicable engineering software	GX Works3				
Programming language	Ladder					
Number of steps (maximum)	213 steps					
Function description	<ul> <li>By turning ON i_bEN (Execution command), the current value per cycle after main shaft gear of the output axis No. is changed.</li> <li>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_uErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>					
Compiling method	Macro type					
FB operation type	Pulsed execution (multiple scan execut	ion type)				

Item	Description
Timing chart	When operation completes without an error
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous control change command 2: Change current value per cycle after main shaft gear
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous control change No processing
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0 Error code 0
Restrictions and precautions	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No.</li> <li>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.</li> </ul>
	• Every input must be provided with a value for proper FB operation.

Enorcodes						
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.				

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## ■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-R simple motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 16	Set the axis whose current value per cycle after main shaft gear is to be changed. The setting range differs depending on the module used.
Cd.408: Synchronous control change value	i_dSyncCtrlChangeValue	Double word [signed]	-2147483648 to 2147483647	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).

### ■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_uErr_Id	Word [unsigned]	0	The error code generated in the FB is stored.

Version Date		Description
00D	2014/06/30	First edition

# 2.26 M+RD77\_ChangeAuxiliaryShaftGearPositionPerCycl e

#### Name

M+RD77\_ChangeAuxiliaryShaftGearPositionPerCycle

Function overvie	w				
Item	Description				
Function overview	Changes the current value per cycle after auxiliary shaft gear to a synchronous control change value.			Je.	
Symbol		M+RD77_ChangeAuxiliaryShaftGearPositionPerCycle			
	Execution command — B :	i_bEN		o_bENO : B —	— Execution status
	Module label DU	JT : i_stľ	Module	o_bOK : B —	Completed without error
	Output axis No. ——UW	UW : i_uOutputAxis		o_bErr : B Error flag	— Error flag
	Cd.408: Synchronous D : control change value	: i_dSyn	cCtrlChangeValue	o_uErrld : UW —	— Error code
Applicable hardware and	Applicable module		RD77MS16, RD77MS8, RD77MS4, RD77MS2		
software	Applicable CPU		MELSEC iQ-R series		
	Applicable engineering software		GX Works3		
Programming language	Ladder				
Number of steps (maximum)	213 steps				
Function description	<ul> <li>By turning ON i_bEN (Execution command), the current value per cycle after auxiliary shaft gear of the output axis No. is changed.</li> <li>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_UErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>				e FB processing is , o_bErr (Error flag) turns
Compiling method	Macro type				
FB operation type	Pulsed execution (multiple scan	executi	on type)		

Item	Description
Timing chart	When operation completes without an error
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous control change command 3: Change current value per cycle after auxiliary shaft gear
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous control change No processing
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0 Error code 0
Restrictions and precautions	<ul> <li>The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>The FB cannot be used in an interrupt program.</li> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No.</li> <li>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.</li> <li>Every input must be provided with a value for proper FB operation.</li> </ul>

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.				

# ■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-R simple motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 16	Set the axis whose current value per cycle after auxiliary shaft gear is to be changed. The setting range differs depending on the module used.
Cd.408: Synchronous control change value	i_dSyncCtrlChange Value	Double word [signed]	-2147483648 to 2147483647	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).

#### ■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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

#### M+RD77\_MoveCamPositionPerCycle

Function overvie	w				
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					
		M+RD77_MoveCamPositionF	PerCycle		
	Execution command —— B : i_bEl	Ν	o_bENO : B	— Execution status	
	Module label —— DUT : i_	stModule	o_bOK : B	— Completed without error	
	Output axis No. ——UW : i_u	ıOutputAxis	o_bErr : B	— Error flag	
	Cd.408: Synchronous — D : i_dSy control change value			— Error code	
	Cd.409: Synchronous	ISyncCtrlReflectionTime			
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4, RD77MS2			
software	Applicable CPU	MELSEC iQ-R series	MELSEC iQ-R series		
	Applicable engineering software	GX Works3			
Programming language	Ladder				
Number of steps (maximum)	355 steps				
Function description	<ul> <li>By turning ON i_bEN (Execution command), the cam axis current value per cycle of the output axis No. is moved.</li> <li>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.</li> <li>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_uErrld (Error code).</li> <li>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_uErrld (Error code).</li> </ul>				
Compiling method	Macro type				
FB operation type	Pulsed execution (multiple scan execution type)				

ltem	Description
Timing chart	When operation completes without an error
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous control change command 4: Cam axis current value per cycle movement
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0
	When an error occurs
	i_bEN (Execution command)
	o_bENO (Execution status)
	Synchronous control change No processing
	Synchronous control change request
	o_bOK (Completed without error)
	o_bErr (Error flag)
	o_uErrld (Error code) 0 Error code 0
estrictions and precautions	the required system operation.
	• The FB cannot be used in an interrupt program.
	<ul> <li>When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No.</li> <li>If this FB is used together with other synchronous control change FBs that have the same output axis No., secure one</li> </ul>
	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 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.

# ■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-R simple motion module.
Output axis No.	i_uOutputAxis	Word [unsigned]	1 to 16	Set the axis number whose cam axis current value per cycle is to be moved. The setting range differs depending on the module used.
Cd.408: Synchronous control change value	i_dSyncCtrlChange Value	Double word [signed]	-2147483648 to 2147483647	Set the amount of the cam axis current value per cycle movement.
Cd.409: Synchronous control reflection time	i_uSyncCtrlReflecti onTime	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.

# ■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_uErrld	Word [unsigned]	0	The error code generated in the FB is stored.

Version	Date	Description
00D	2014/06/30	First edition

#### M+RD77\_MakeRotaryCutterCam

Function overvie	W			
Item	Description			
Function overview	Automatically generates the cam for a rotary cutter.			
Symbol				
		M+RD77_MakeRotaryCutterCa	m	
	Execution command —— B : i_bl	EN	o_bENO : B Execution status	
	Module label —— DUT : i	_stModule	o_bOK : B Completed without	
	Cd.609: Cam UW : i_	uCamNo	o_bErr : B —— Error flag	
	Cd.611: Cam resolution —— UW : i_	uResolution	o_uErrld : U —— Error code	
	Cd.611: Sheet length —— UD : i_	udSheetLength		
	Sheet synchronous width	udSheetSyncWidth		
	Synchronous axis length	udSyncAxisLength		
	starting point	udSyncStartPoint		
	Cd.611: SynchronousW : i_w	SyncSectionAccelerationRatio		
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4, R	D77MS2	
software	Applicable CPU	MELSEC iQ-R series		
	Applicable engineering software	GX Works3		
Programming language	Ladder	•		
Number of steps (maximum)	66 steps			
Function description	By turning ON i_bEN (Execution comm	and), the cam for a rotary cutter is autom	natically generated.	
Compiling method	Macro type			
FB operation type	Pulsed execution (multiple scan execut	ion type)		
Timing chart				
	i_bEN (Execution command)			
	o_bENO (Execution status)			
	Cam auto-generation request			
	o_bOK (Completed without er	ror)		
Restrictions and precautions	the required system operation.	ution of this FB, o_bOK (Completed without program.	ery processing separately in accordance with out error) turns ON.	

Error codes				
Error code	Description	Action		
None	None	None		

### ■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-R simple motion module.
Cd.609: Cam auto- generation cam No.	i_uCamNo	Word [unsigned]	1 to 256	Set the cam number to be automatically generated.
Cam resolution	i_uResolution	Word [unsigned]	256/512/1024/2048/ 4096/8192/16384/ 32768	Set the resolution of the cam to be generated.
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.
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.
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.
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.
Synchronous section acceleration ratio	i_wSyncSectionAcce lerationRatio	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_uErrld	Word [unsigned]	0	Always 0

Version	Date	Description			
00D	2014/06/30	First edition			

#### M+RD77\_CalcCamCommandPosition

Item	Description				
Function overview	Calculates a cam axis feed current value, and outputs the calculation result.				
Symbol					
		M+RD77_CalcCamCom	nmandPosition		
	Execution command ——B : i_	bEN	o_bENO : B —	— Execution status	
	Module label —— DUT	: i_stModule	o_bOK : B —	— Completed without error	
	Cd.613: Cam No. —— UW :	i_uCamNo	o_dResult : D —	— Cam position calculation result	
	Cd.614: Stroke amount — D : i_	dStroke	o_bErr : B —	— Error flag	
	Cd.615: Cam axis length ——UD : per cycle	i_udLengthPerCycle	o_uErrld : UW —	— Error code	
		dReferencePosition			
	Cd.617: Cam axis current — UD : value per cycle	i_udCommandPositionPerCycle	2		
Applicable hardware and	Applicable module	RD77MS16, RD77MS8, RD77MS4, RD77MS2			
software	Applicable CPU	MELSEC iQ-R series			
	Applicable engineering software	GX Works3			
Programming language	Ladder				
Number of steps (maximum)	58 steps				
Function description	By turning ON i_bEN (Execution comm	and), the cam axis feed current	value is calculated.		
Compiling method	Macro type				
FB operation type	Pulsed execution (multiple scan execu	tion type)			
Timing chart	i_bEN (Execution command)	1			
	o_bENO (Execution status)				
	Cam position calculation reques	it	<b>▼</b>		
	o_dResult (Cam position calculation result)	0	Calculation result	0	
	o_bOK (Completed without error	r)			
Restrictions and precautions	<ul> <li>The FB does not include error recover the required system operation.</li> <li>Even if a warning occurs in the exection of the FB cannot be used in an interrule.</li> <li>Every input must be provided with a second system.</li> </ul>	ution of this FB, o_bOK (Comple of program.		ely in accordance with	

Error codes		
Error code	Description	Action
None	None	None

### ■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-R simple motion module.
Cd.613: Cam No.	i_uCamNo	Word [unsigned]	0 to 256	Set the cam number used for the calculation cam.
Cd.614: Stroke amount	i_dStroke	Double word [signed]	-2147483648 to 2147483647	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	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	Set the cam reference position used for the cam position calculation.
Cd.617: Cam axis current value per cycle	i_udCommandPosition PerCycle	Double word [unsigned]	0 to (Cam axis length per cycle)	Set the cam axis current value per cycle used for the cam position calculation.

# ■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_uErrld	Word [unsigned]	0	Always 0

Version	Date	Description	
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#### M+RD77\_CalcCamPositionPerCycle

Item	Description				
Function overview	Calculates a cam axis current value per cycle, and outputs the calculation result.				
		ue per	cycle, and outputs the calculati		
Symbol			M+RD77 CalcCamPos	sitionPerCycle	
		WHICH I _Calc			
	Execution command ——	B:i_t	DEN	o_bENO : B -	— Execution status
	Module label ——	DUT :	i_stModule	o_bOK : B -	Completed without     error
	Cd.613: Cam No. ——	UW :	i_uCamNo	o_dResult : D -	—— Cam position calculation result
	Cd.614: Stroke amount ——	D : i_0	dStroke	o_bErr : B -	—— Error flag
	Cd.615: Cam axis length —— per cycle	UD : i	_udLengthPerCycle	o_uErrld : UW –	—— Error code
	Cd.616: Cam reference —— position	D : i_0	dReferencePosition		
	Cd.617: Cam axis current —— value per cycle		_udCommandPositionPerCycle		
	Cd.618: Cam axis feed —— current value	D : i_0	dCommandPosition		
Applicable hardware and	Applicable module		RD77MS16, RD77MS8, RD77	7MS4, RD77MS2	
software	Applicable CPU		MELSEC iQ-R series		
	Applicable engineering software		GX Works3		
Programming language	Ladder				
Number of steps (maximum)	63 steps				
Function description	By turning ON i_bEN (Execution of	comma	and), the cam axis current value	per cycle is calculated.	
Compiling method	Macro type				
FB operation type	Pulsed execution (multiple scan e	executi	on type)		
Timing chart	i_bEN (Execution command) o_bENO (Execution status)				
	Cam position calculation o_dResult (Cam position	•			
	calculation result) o_bOK (Completed witho	out erre	0	Calculation result	- U
Restrictions and precautions	<ul> <li>The FB does not include error r the required system operation.</li> <li>Even if a warning occurs in the</li> <li>The FB cannot be used in an ir</li> <li>Every input must be provided w</li> </ul>	execu nterrup	tion of this FB, o_bOK (Comple t program.		tely in accordance with

Error codes		
Error code	Description	Action
None	None	None

### ■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-R simple motion module.
Cd.613: Cam No.	i_uCamNo	Word [unsigned]	0 to 256	Set the cam number used for the calculation cam.
Cd.614: Stroke amount	i_dStroke	Double word [signed]	-2147483648 to 2147483647	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	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	Set the cam reference position used for the cam position calculation.
Cd.617: Cam axis current value per cycle	i_udCommandPosition PerCycle	Double word [unsigned]	0 to (Cam axis length per cycle)	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	Set the cam axis feed current value used for the cam position calculation.

### ■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_uErrld	Word [unsigned]	0	Always 0

Version	Date	Description
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