MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-R series

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

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# 1 List of FBs

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. |

# MEMO

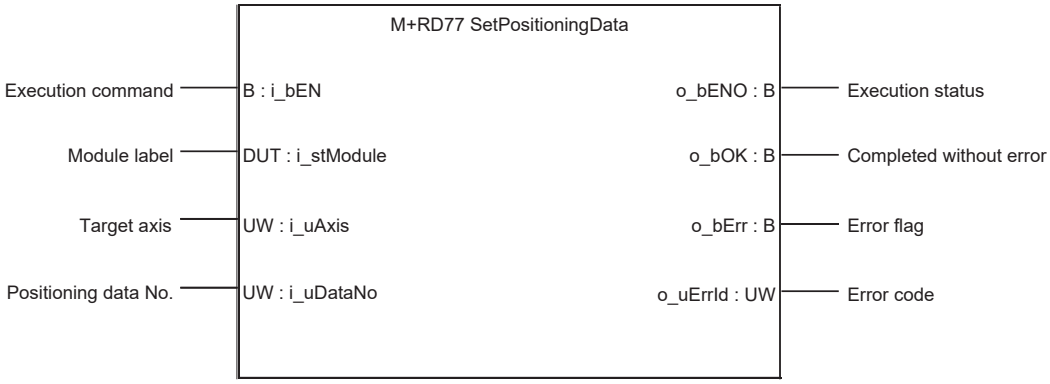
# 2 Simple Motion Module FB

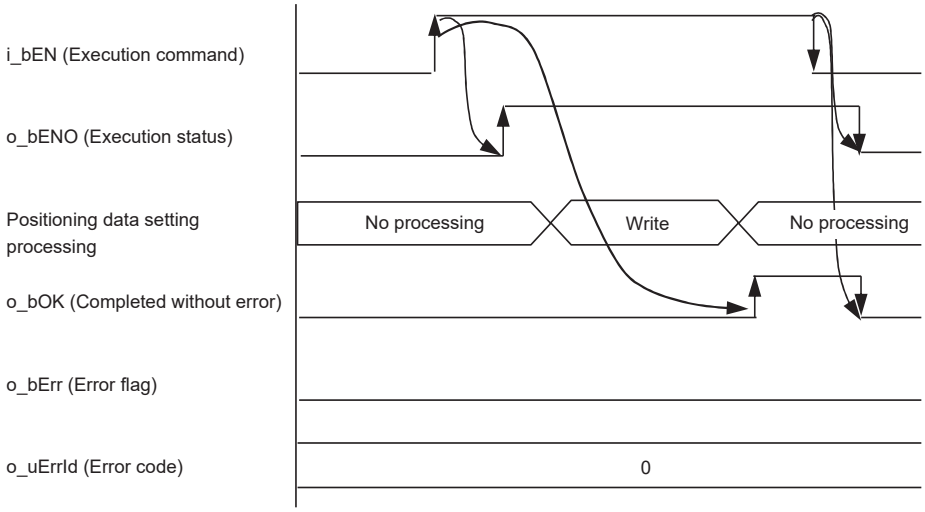
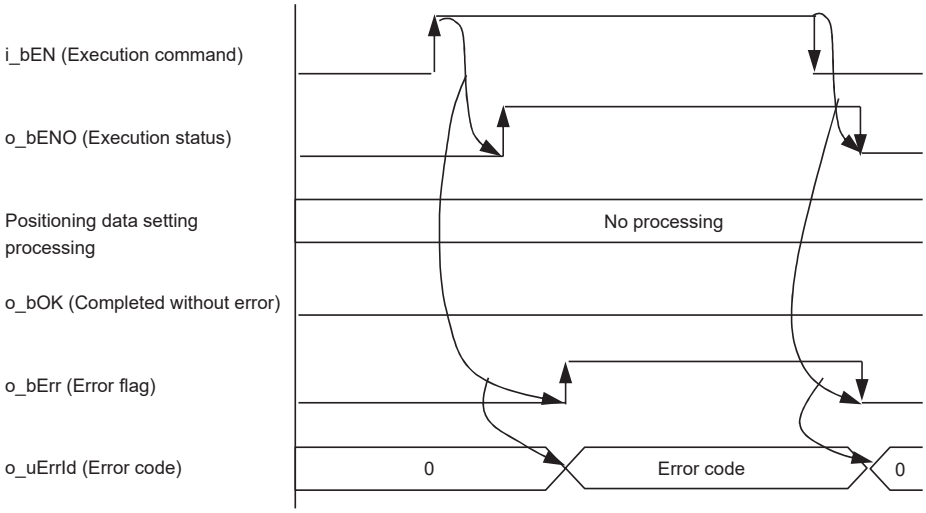
## 2.1 M+RD77_SetPositioningData

### Name

M+RD77_SetPositioningData

### Function overview

| Item | Description | |
|---|---|---|
| Function overview | Sets positioning data (Da.1 to Da.10, Da.20 to Da.22, Da.27 to Da.29). | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| 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.<br>• 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).<br>• When the setting value of the positioning data No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 101 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (single scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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. |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No.<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that setting the positioning data has been completed. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

## ■Disclosed labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Da.1: Operation pattern | pb_uOpePattern | Word [unsigned] | 0: Positioning complete<br>1: Continuous positioning control<br>3: Continuous path control | Specify whether the positioning is completed with the data being executed, or continues with the following data.<br>When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled.<br>For example, when 4 is set, 0 is applied. |
| Da.2: Control system | pb_uCtrlSys | Word [unsigned] | 01H: ABS1 1-axis linear control (ABS)<br>02H: INC1 1-axis linear control (INC)<br>03H: FEED1 1-axis fixed-feed control<br>04H: VF1 1-axis speed control (Forward)<br>05H: VR1 1-axis speed control (Reverse)<br>06H: VPF Speed-position switching control (Forward)<br>07H: VPR Speed-position switching control (Reverse)<br>08H: PVF Position-speed switching control (Forward)<br>09H: PVR Position-speed switching control (Reverse)<br>0AH: ABS2 2-axis linear interpolation control (ABS)<br>0BH: INC2 2-axis linear interpolation control (INC)<br>0CH: FEED2 Fixed-feed control by 2-axis linear interpolation<br>0DH: ABS⌒ Circular interpolation control with sub point designation (ABS)<br>0EH: INC⌒ Circular interpolation control with sub point designation (INC)<br>0FH: ABS. Circular interpolation control with center point designation (ABS, CW)<br>10H: ABS. Circular interpolation control with center point designation (ABS, CCW)<br>11H: INC. Circular interpolation control with center point designation (INC, CW)<br>12H: INC. Circular interpolation control with center point designation (INC, CCW)<br>13H: VF2 2-axis speed control (Forward)<br>14H: VR2 2-axis speed control (Reverse)<br>15H: ABS3 3-axis linear interpolation control (ABS)<br>16H: INC3 3-axis linear interpolation control (INC)<br>17H: FEED3 Fixed-feed control by 3-axis linear interpolation<br>18H: VF3 3-axis speed control (Forward)<br>19H: VR3 3-axis speed control (Reverse)<br>1AH: ABS4 4-axis linear interpolation control (ABS)<br>1BH: INC4 4-axis linear interpolation control (INC)<br>1CH: FEED4 Fixed-feed control by 4-axis linear interpolation<br>1DH: VF4 4-axis speed control (Forward)<br>1EH: VR4 4-axis speed control (Reverse)<br>80H: NOP NOP instruction<br>81H: POS Current value changing<br>82H: JUMP JUMP instruction<br>83H: LOOP Top of LOOP-LEND loop<br>84H: LEND End of LOOP-LEND loop | Sets the control system for positioning control. |
| Da.3: Acceleration time No. | pb_uAccTimeNo | Word [unsigned] | 0: Acceleration time 0<br>1: Acceleration time 1<br>2: Acceleration time 2<br>3: Acceleration time 3 | Set any of the acceleration time 0 to 3 as the acceleration time for positioning.<br>When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled.<br>For example, when 4 is set, 0 is applied. |

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Da.4: Deceleration time No. | pb_uDecTimeNo | Word [unsigned] | 0: Deceleration time 0<br>1: Deceleration time 1<br>2: Deceleration time 2<br>3: Deceleration time 3 | Set any of the deceleration time 0 to 3 as the deceleration time for positioning.<br>When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled.<br>For example, when 4 is set, 0 is applied. |
| Da.10: M code | pb_uMcode | Word [unsigned] | Da.2: Control system = 82H: JUMP instruction<br>• 0 to 10<br>Da.2: Control system = 83H: LOOP<br>• 1 to 65535<br>Da.2: Control system = Other than the above<br>• 0 to 65535<br>(0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.) | Set the condition data No., number of repetitions, or M code for the control system. |
| Da.9: Dwell time | pb_uDwellTime | Word [unsigned] | Da.2: Control system = 82H: JUMP instruction<br>• 1 to 600<br>Da.2: Control system = 82H: Other than JUMP instruction<br>• 0 to 65535<br>(0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.) | Set the positioning data No. or dwell time for the control system. |
| Da.27: M code ON signal output timing | pb_uMcodeOnTiming | Word [unsigned] | 0: Setting value of Pr.18 M code ON signal output timing<br>1: WITH mode<br>2: AFTER mode | Set the timing to output the M code ON signal.<br>When 4 or higher is specified, bit 0 and 1 are enabled.<br>For example, when 4 is set, 0 is applied. |
| Da.28: ABS direction in degrees | pb_uABS | Word [unsigned] | 0: Setting value of Cd.40 ABS direction in degrees<br>1: ABS circular right<br>2: ABS circular left<br>3: Takes a shortcut. (Specified direction ignored.) | Set the movement direction of ABS when the unit is degree under position control.<br>When 4 or higher, which is out of the setting range, is specified, bit 0 and 1 are enabled.<br>For example, when 4 is set, 0 is applied. |
| Da.29: Interpolation speed designation method | pb_uInterpolateSpd | Word [unsigned] | 0: Setting value of Pr.20 Interpolation speed designation method.<br>1: Composite speed<br>2: Reference axis speed | Set whether to specify the composite speed or reference axis speed when performing liner interpolation or circular interpolation.<br>When 8 or higher is specified, bit 0, 1, and 2 are enabled.<br>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<br>• 1 to 2,000,000,000<br>Pr.1: Unit setting = 3<br>• 1 to 5,000,000 | Set the command speed for positioning. |
| | | | FFFFFFFFH: Current speed<br>(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<br>• Da.2: Control system = 06H to 09H: 0 to 2,147,483,647<br>Pr.1: Unit setting = 0, 1, 3<br>• Da.2: Control system = Other than 06H to 09H: -2,147,483,648 to 2,147,483,647<br>Pr.1: Unit setting = 2<br>• Da.2: Control system = 01H, 0AH, 15H, 1AH, 81H, 20H, 22H, 23H: 0 to 35,999,999<br>Pr.1: Unit setting = 2<br>• Da.2: Control system = 02H, 0BH, 16H, 1BH, 03H, 0CH, 17H, 1CH, 20H, 22H, 23H: -2,147,483,648 to 2,147,483,647<br>Pr.1: Unit setting = 2<br>• Da.2: Control system = 06H, 07H: 0 to 2,147,483,647 (INC mode), 0 to 35,999,999 (ABS mode)<br>Pr.1: Unit setting = 2<br>• Da.2: Control system = 08H, 09H: 0 to 2,147,483,647 | Specify the target position or movement amount for positioning control.<br>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<br>• -2,147,483,648 to 2,147,483,647<br>Pr.1: Unit setting = 2<br>• 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_uInterpolatedAxNo1 | Word [unsigned] | 0H: Axis 1<br>1H: Axis 2<br>2H: Axis 3<br>3H: Axis 4<br>4H: Axis 5<br>5H: Axis 6<br>6H: Axis 7<br>:<br>:<br>EH: Axis 15<br>FH: Axis 16 | Set the interpolation-target axis 1 when performing interpolation operation.<br>Values out of the setting range or the own axis cannot be set as the interpolation-target axis.<br>Set 0 to disable the interpolation.<br>When 100H or higher is set, lower 8 bits (bit 0 to 7) are enabled.<br>For example, when 101H is set, 1H is applied. |
| Da.21: Axis to be interpolated No. 2 | pb_uInterpolatedAxNo2 | Word [unsigned] | 0H: Axis 1<br>1H: Axis 2<br>2H: Axis 3<br>3H: Axis 4<br>4H: Axis 5<br>5H: Axis 6<br>6H: Axis 7<br>:<br>:<br>EH: Axis 15<br>FH: Axis 16 | Set the interpolation-target axis 2 when performing interpolation operation.<br>Values out of the setting range or the own axis cannot be set as the interpolation-target axis.<br>Set 0 to disable the interpolation or for 2-axis interpolation control.<br><br>When 100H or higher is set, lower 8 bits (bit 0 to 7) are enabled.<br>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_uInterpolatedAxNo3 | Word [unsigned] | 0H: Axis 1<br>1H: Axis 2<br>2H: Axis 3<br>3H: Axis 4<br>4H: Axis 5<br>5H: Axis 6<br>6H: Axis 7<br>:<br>:<br>EH: Axis 15<br>FH: Axis 16 | Set the interpolation-target axis 3 when performing interpolation operation.<br>Values out of the setting range or the own axis cannot be set as the interpolation-target axis.<br>Set 0 to disable the interpolation, for 2-axis interpolation control, or for 3-axis interpolation control.<br>When 100H or higher is set, lower 8 bits (bit 0 to 7) are enabled.<br>For example, when 101H is set, 1H is applied. |

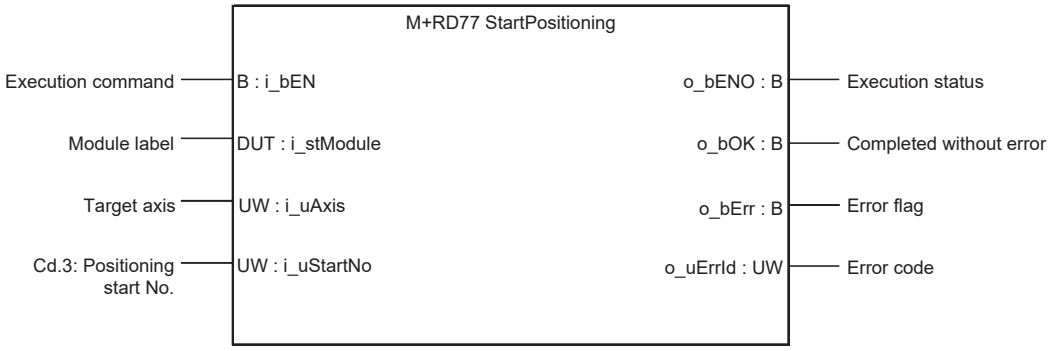
# 2.2 M+RD77_StartPositioning

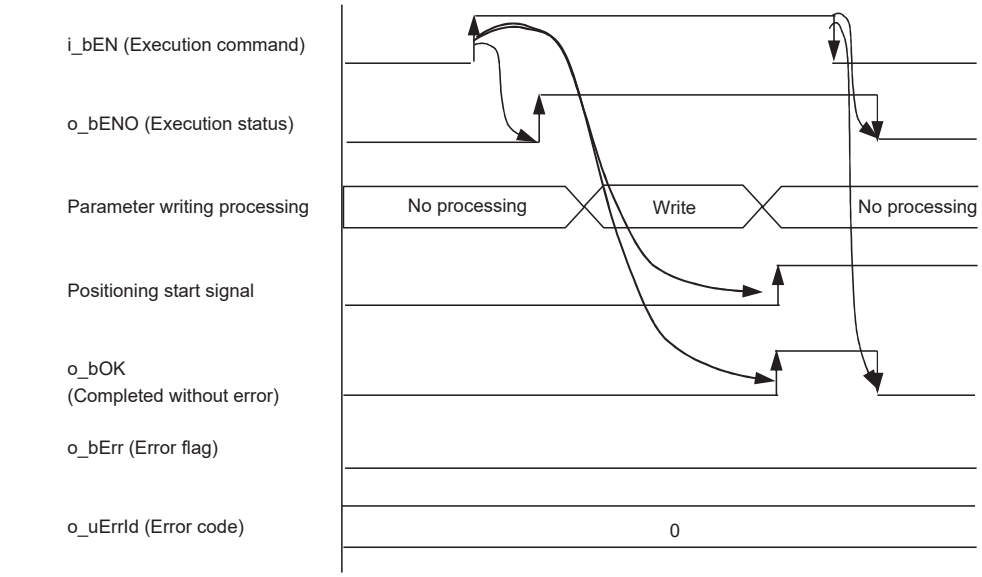
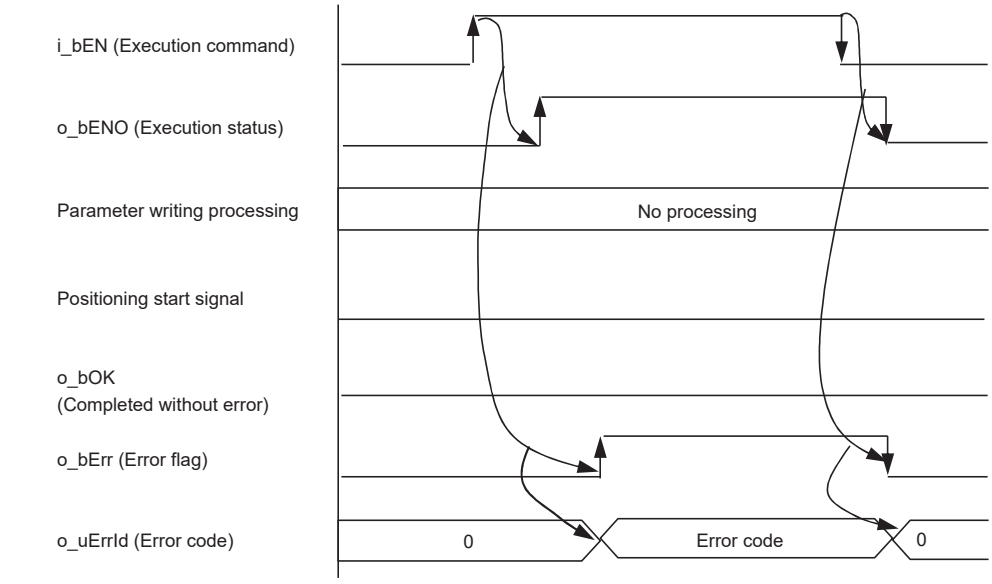
## Name

M+RD77_StartPositioning



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Starts the positioning operation. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| 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.<br>• This FB is activated by turning ON the positioning start signal (Y10 to Y1F).<br>• Only when the following 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: READY signal (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 are not met, the error code 200 (hexadecimal) is stored in o_uErrId (Error code).<br>• 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.<br>• 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).<br>• When the setting value of the positioning start No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 102 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• This FB turns ON and OFF the positioning start signal (Y10 to Y1F). Thus, do not turn ON or OFF the positioning start signal (Y10 to Y1F) by any other means while this FB is being executed.<br>• 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 interlock to prevent the FBs from being activated at the same time.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• When this FB is used in two or more places, a duplicated coil warning may occur during compile operation due to the Y signal being operated by the module label. However, this is not a problem and the FB will operate without an error.<br>• This FB does not set the data when started. Data required for controlling the start No. must be set on the parameter or buffer memory.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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 are not met.<br>• READY signal: On<br>• Positioning start signal: Off<br>• Start complete signal: Off<br>• BUSY signal: Off | Execute the FB when all of the following conditions are met.<br>• READY signal: On<br>• Positioning start signal: Off<br>• Start complete signal: Off<br>• BUSY signal: Off |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No.<br>The setting range differs depending on the module used. |
| Cd.3: Positioning start No. | i_uStartNo | Word [unsigned] | 1 to 600: Positioning data No.<br>7000 to 7004: Block start designation<br>9001: Machine home position return<br>9002: Fast-home position return<br>9003: Current value changing<br>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

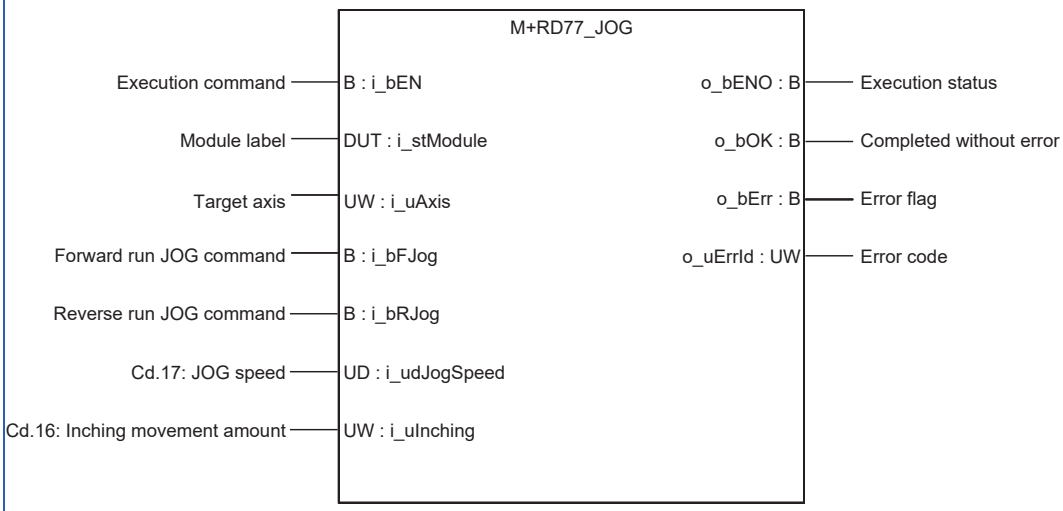
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that executing this FB has been completed. However, this label does not turn ON when a module error occurs at the start. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

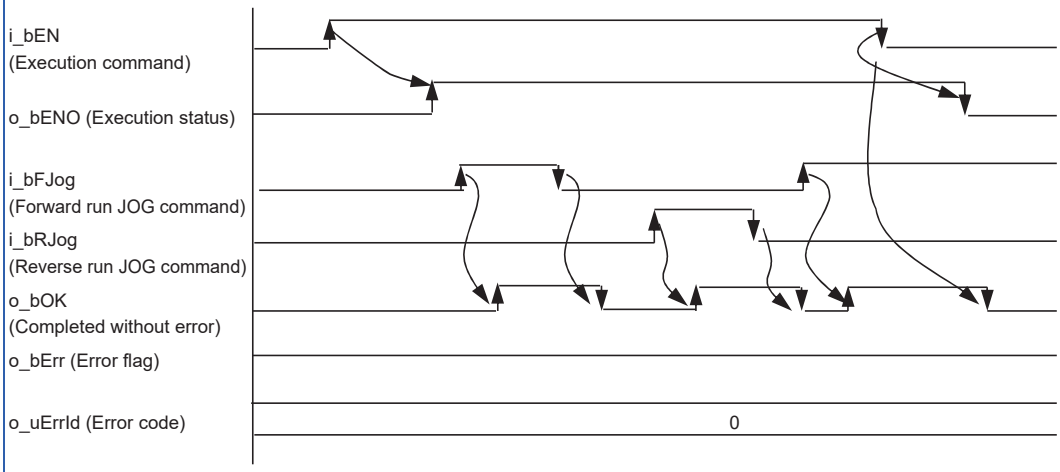
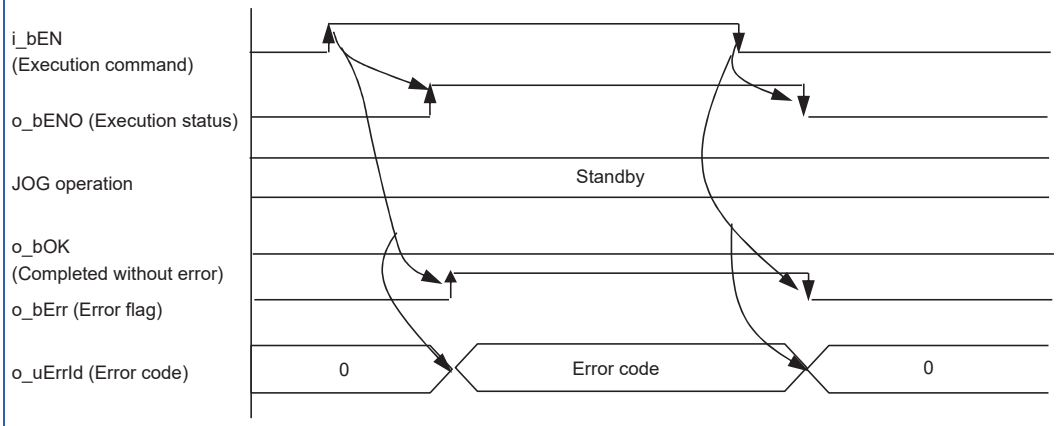
# 2.3 M+RD77_JOG

## Name

M+RD77_JOG

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Performs the JOG operation or inching operation. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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.<br>• When i_bFJog (Forward run JOG command) and i_bRJog (Reverse run JOG command) are ON at the same time, the operation stops.<br>• 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.<br>• 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).<br>• 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<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• 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 any other means while this FB is being executed.<br>• When this FB is used twice or more or FB operates the same Y signal as this FB does, create an interlock to prevent the FBs from being activated at the same time.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Setting a large value for the JOG speed from the beginning is dangerous. For the safety, set a small value first, and increase the value gradually while checking the operation to determine the value optimal for the control.<br>• When values other than 0 are set in both i_uInching (Cd.16: Inching movement amount) and i_udJogSpeed (Cd.17: JOG speed), inching operation is performed.<br>• When this FB is used in two or more places, a duplicated coil warning may occur during compile operation due to the Y signal being operated by the module label. However, this is not a problem and the FB will operate without an error.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.) |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No.<br>The setting range differs depending on the module used. |
| Forward run JOG command | i_bFJog | Bit | ON, OFF | Turn ON this label when performing the forward run JOG operation or forward run inching operation. |
| Reverse run JOG command | i_bRJog | Bit | ON, OFF | Turn ON this label when performing the reverse run JOG operation or reverse run inching operation. |
| Cd.17: JOG speed | i_udJogSpeed | Double word [unsigned] | Pr.1: Unit setting = mm<br>• 0 to 2000000000<br>Pr.1: Unit setting = inch<br>• 0 to 2000000000<br>Pr.1: Unit setting = degree<br>• 0 to 2000000000<br>Pr.1: Unit setting = pulse<br>• 0 to 1000000000 | Specify the JOG speed.<br>For inching operation, set 0. |
| Cd.16: Inching movement amount | i_uInching | Word [unsigned] | 0 to 65535<br>0: JOG operation<br>(0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.) | Specify the inching movement amount.<br>For JOG operation, set 0. |

### ■Output labels

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

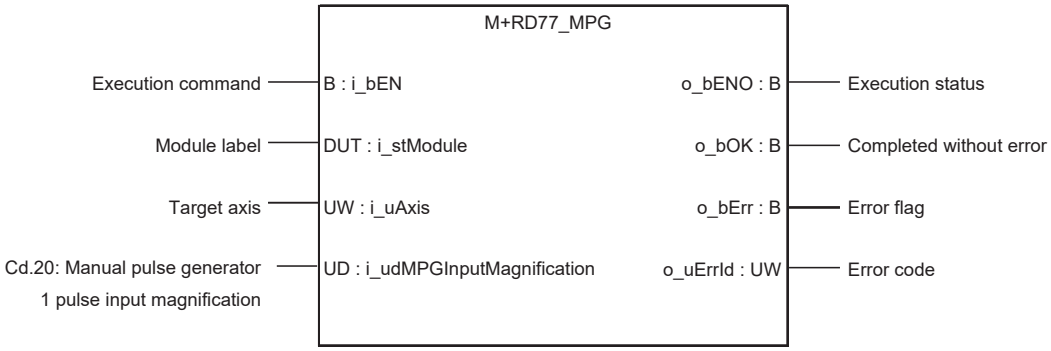
# 2.4 M+RD77_MPG

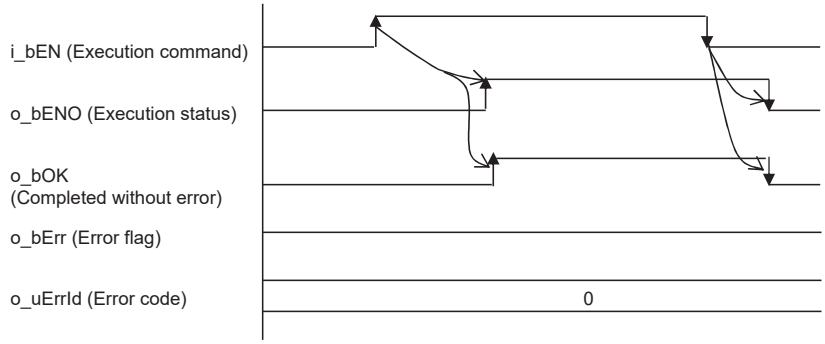
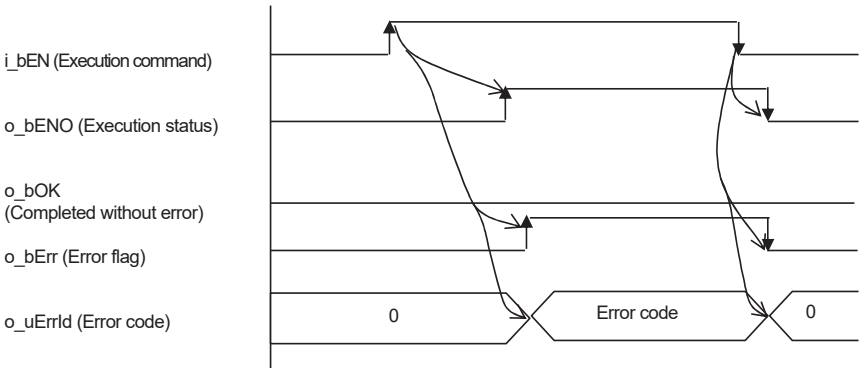
## Name

M+RD77_MPG



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Performs the manual pulse generator operation. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 336 steps | |
| Function description | • By turning ON or OFF i_bEN (Execution command), the manual pulse generator operation is enabled or disabled.<br>• This FB is constantly executed after i_bEN (Execution command) is turned ON.<br>• The workpiece moves according to the pulses input from the manual pulse generator while o_bOK (Completed without error) is ON.<br>• 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<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• Do not change i_uAxis (Target axis) while i_bEN (Execution command) is ON.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>The setting range differs depending on the module used. |
| Cd.20: Manual pulse generator 1 pulse input magnification | i_udMPGInputMagnification | Double word [unsigned] | 1 to 10,000 | Set the input magnification of the manual pulse generator 1 pulse.<br>When the setting value is 0, the magnification is 1.<br>When the setting value is 10,001 or higher, the magnification is 10,000. |

## ■Output labels

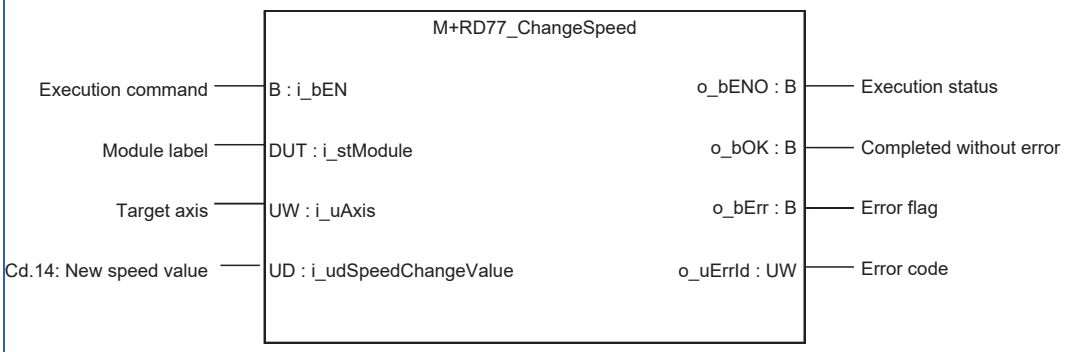
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that the manual pulse generator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

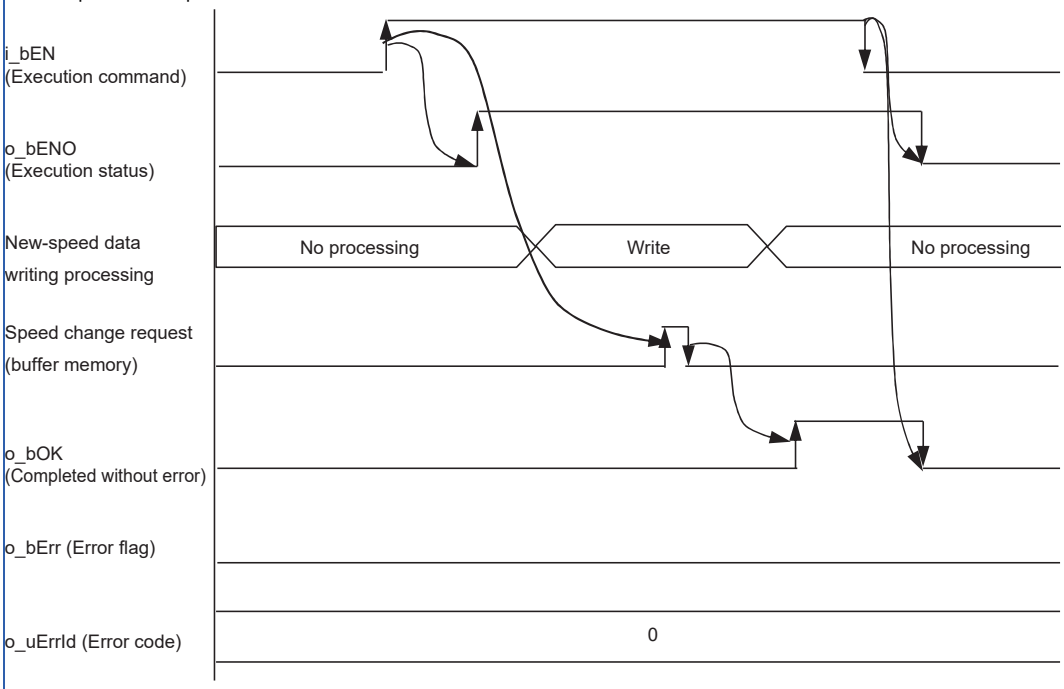
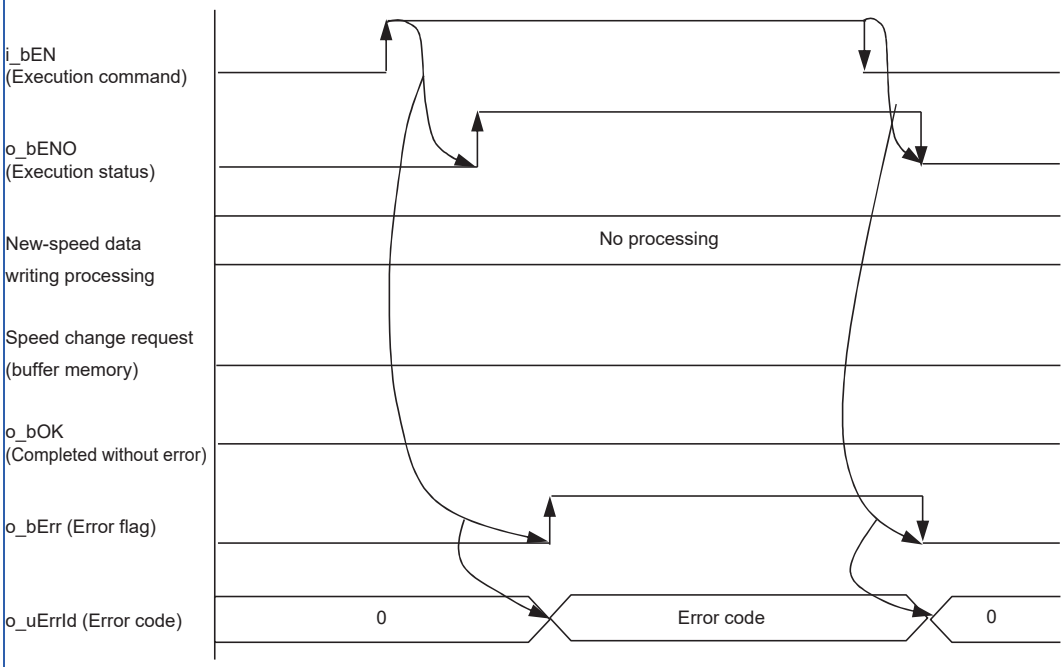
# 2.5 M+RD77_ChangeSpeed

## Name

M+RD77_ChangeSpeed

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the speed. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 210 steps | |
| Function description | • By turning ON i_bEN (Execution command), the speed used for the control is changed to a new speed.<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Every input must be provided with a value for proper FB operation.<br>• When i_bEN (Execution command) is turned ON while the BUSY signal (X10 to X1F) is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 201 (Hexadecimal) is stored in o_uErrId (Error code). |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 16. | Please try again after confirming the setting. |
| 201 (Hexadecimal) | This FB is executed before positioning operation starts. | Please try again during positioning operation. |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No.<br>The setting range differs depending on the module used. |
| Cd.14: New speed value | i_udSpeedChangeValue | Double word [unsigned] | Pr.1: Unit setting = mm<br>• 0 to 2000000000<br>Pr.1: Unit setting = inch<br>• 0 to 2000000000<br>Pr.1: Unit setting = degree<br>• 0 to 2000000000<br>Pr.1: Unit setting = pulse<br>• 0 to 1000000000 | 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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that changing the speed has been completed. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The generated error code is stored. |

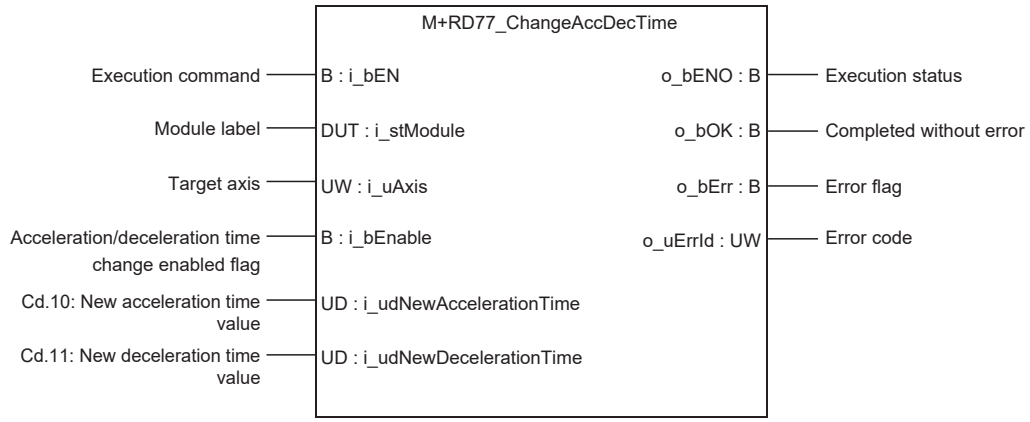
# 2.6 M+RD77_ChangeAccDecTime

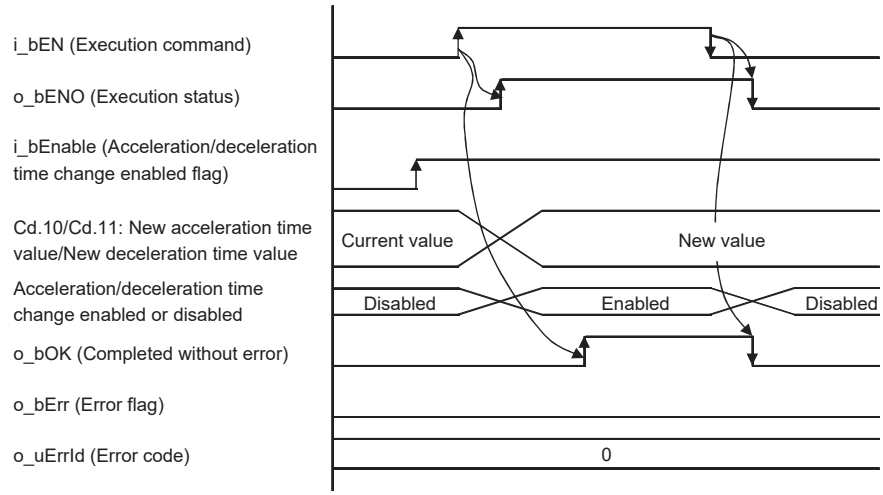
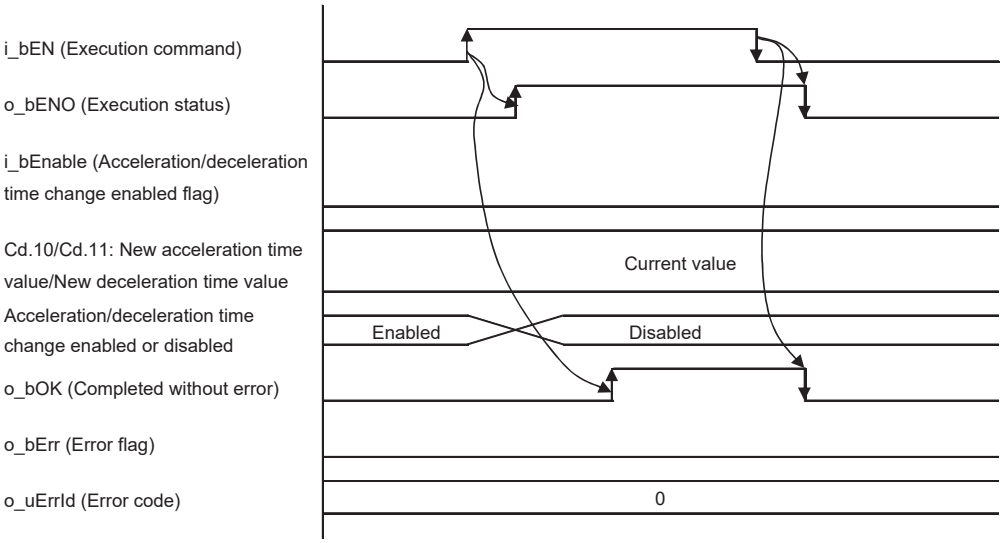
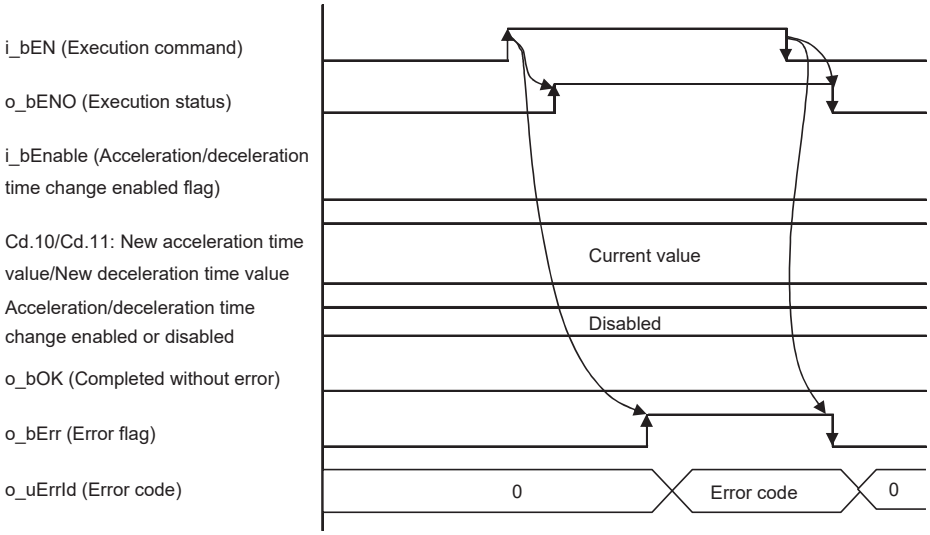
## Name

M+RD77_ChangeAccDecTime



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the acceleration/deceleration time at a speed change. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 212 steps | |
| Function description | • By turning ON i_bEN (Execution command), the setting of the acceleration/deceleration time is changed according to i_bEnable (Acceleration/deceleration time change enabled flag). When i_bEnable (Acceleration/deceleration time change enabled flag) is ON, i_udNewAccelerationTime (Cd.10: New acceleration time value) and i_udNewDecelerationTime (Cd.11: New deceleration time value) are set and Cd.12: Acceleration/deceleration time change during speed change, enable/disable selection is changed to 1: Enables modifications to acceleration/deceleration time. When i_bEnable (Acceleration/deceleration time change enabled flag) is OFF, i_udNewAccelerationTime (Cd.10: New acceleration time value) and i_udNewDecelerationTime (Cd.11: New deceleration time value) are not set and Cd.12: Acceleration/deceleration time change during speed change, enable/disable selection is changed to 0: Disables modifications to acceleration/deceleration time.<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (single scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>• (When Cd.12: Acceleration/deceleration time change during speed change, enable/disable selection is enabled)<br>  <br><br>• (When Cd.12: Acceleration/deceleration time change during speed change, enable/disable selection is disabled)<br>  <br><br>When an error occurs<br>  <br> |

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



## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>The setting range differs depending on the module used. |
| Acceleration/ deceleration time change enabled flag | i_bEnable | Bit | ON: Enabled<br>OFF: Disabled | Set this label to enable or disable acceleration/deceleration time changes. |
| Cd.10: New acceleration time value | i_udNewAccelerationTime | Double word [unsigned] | 0 to 8,388,608 (ms) | Set a new acceleration time.<br>When 0 is set, the acceleration time is not changed after the speed is changed. In this case, the previously set acceleration time is applied to the control. |
| Cd.11: New deceleration time value | i_udNewDecelerationTime | Double word [unsigned] | 0 to 8,388,608 (ms) | Set a new deceleration time.<br>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

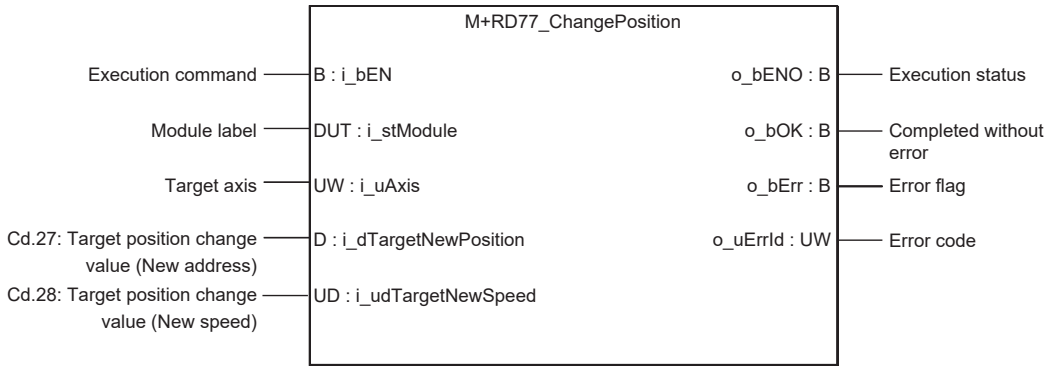
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that setting acceleration/deceleration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

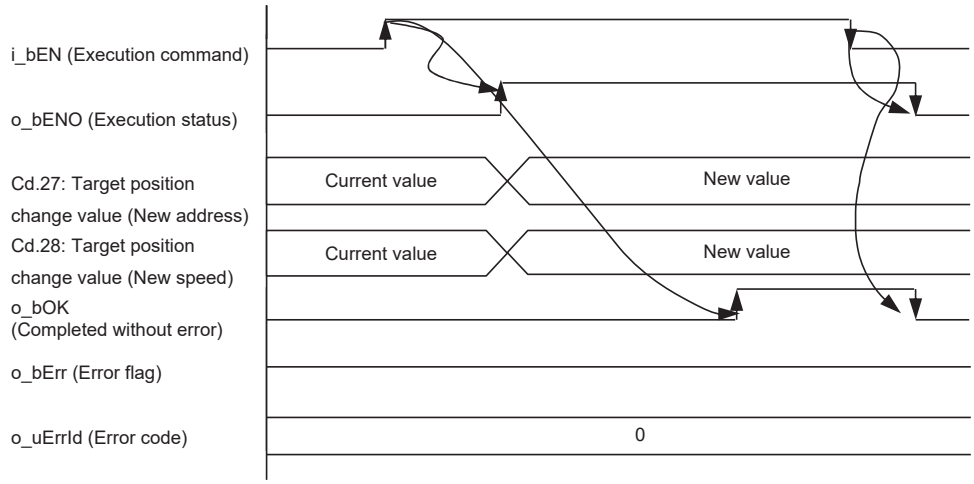
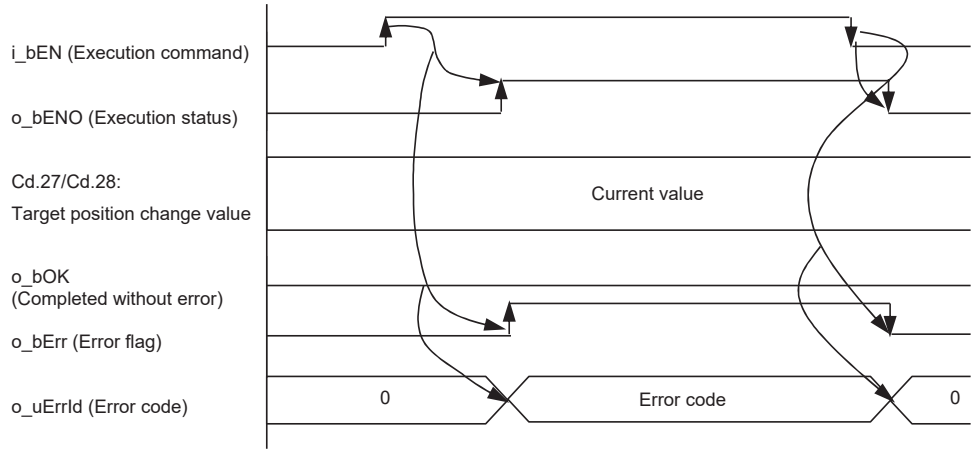
# 2.7 M+RD77_ChangePosition

## Name

M+RD77_ChangePosition

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the target position. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 254 steps | |
| Function description | • By turning ON i_bEN (Execution command), the target position is changed according to the value set in i_dTargetNewPosition (Cd.27: Target position change value (New address)) and the speed is changed according to the value set in i_udTargetNewSpeed (Cd.28: Target position change value (New speed)) during position control.<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Every input must be provided with a value for proper FB operation.<br>• When i_bEN (Execution command) is turned ON while the BUSY signal (X10 to X1F) is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 201 (Hexadecimal) is stored in o_uErrId (Error code). |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 16. | Please try again after confirming the setting. |
| 201 (Hexadecimal) | This FB is executed before positioning operation starts. | Please try again during positioning operation. |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No.<br>The setting range differs depending on the module used. |
| Cd.27: Target position change value (New address) | i_dTargetNewPosition | Double word [signed] | Pr.1: Unit setting = mm<br>• ABS: -2147483648 to +2147483647<br>• INC: -2147483648 to +2147483647<br>Pr.1: Unit setting = inch<br>• ABS: -2147483648 to +2147483647<br>• INC: -2147483648 to +2147483647<br>Pr.1: Unit setting = degree<br>• ABS: 0 to 35999999<br>• INC: -2147483648 to +2147483647<br>Pr.1: Unit setting = pulse<br>• ABS: -2147483648 to +2147483647<br>• INC: -2147483648 to +2147483647 | Set the new positioning address when changing the target position during positioning operation. |
| Cd.28: Target position change value (New speed) | i_udTargetNewSpeed | Double word [unsigned] | Pr.1: Unit setting = mm<br>• 0 to 2000000000<br>Pr.1: Unit setting = inch<br>• 0 to 2000000000<br>Pr.1: Unit setting = degree<br>• 0 to 2000000000<br>Pr.1: Unit setting = pulse<br>• 0 to 1000000000 | Set the new speed when changing the target position during positioning operation.<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that the module has accepted the target position change values. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The generated error code is stored. |

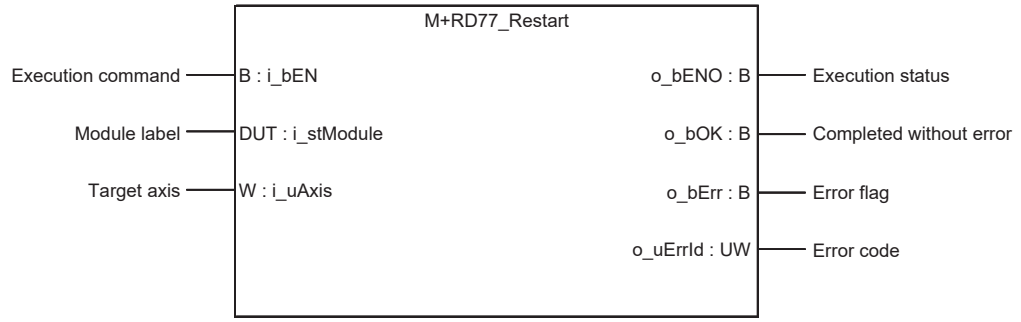
# 2.8 M+RD77_Restart

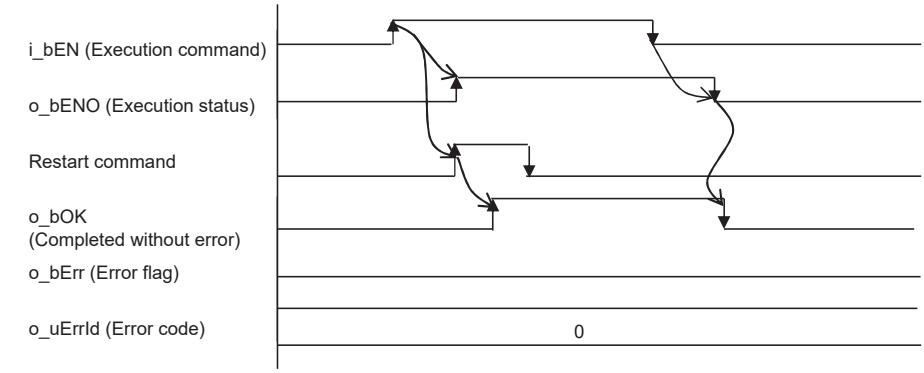
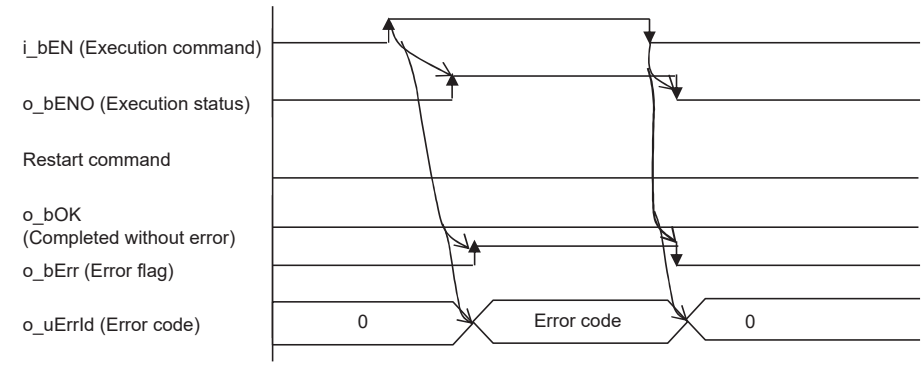


## Name

M+RD77_Restart

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Restarts the axis being stopped. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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 following 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).<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 16. | Please try again after confirming the setting. |
| 202 (Hexadecimal) | The conditions for positioning restart are not met.<br>Any of the following conditions are not met.<br>• Positioning complete signal: Off<br>• Axis operation status: Stop | Please try again after confirming the setting.<br>• Positioning complete signal: Off<br>• Axis operation status: Stop |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No.<br>The setting range differs depending on the module used. |

### ■Output labels

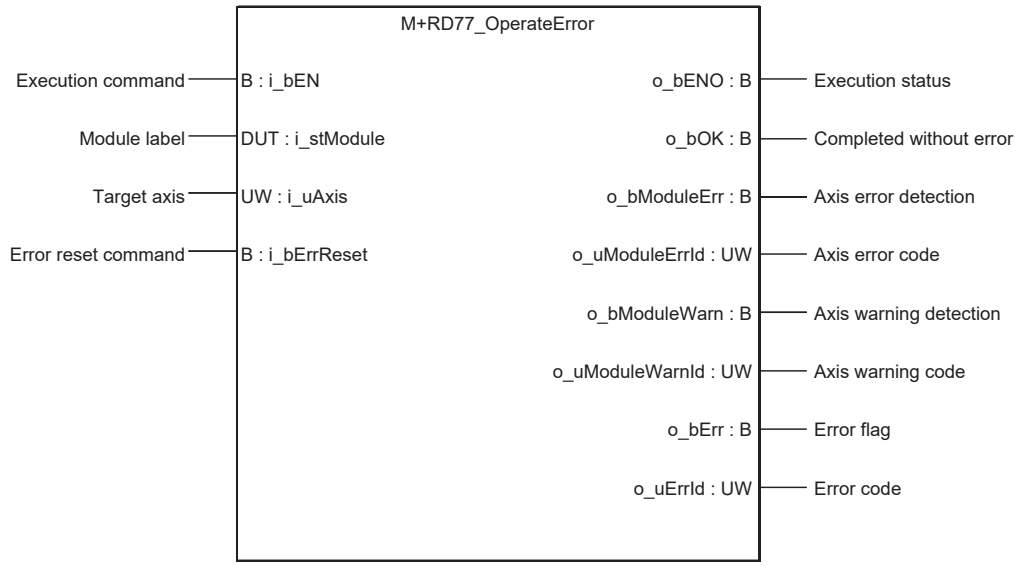
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that the module has accepted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

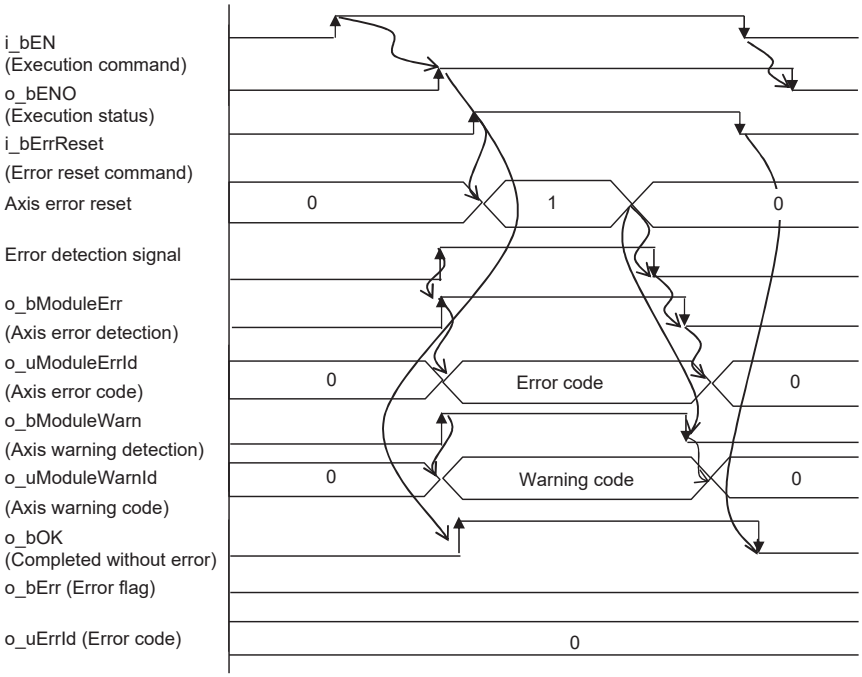
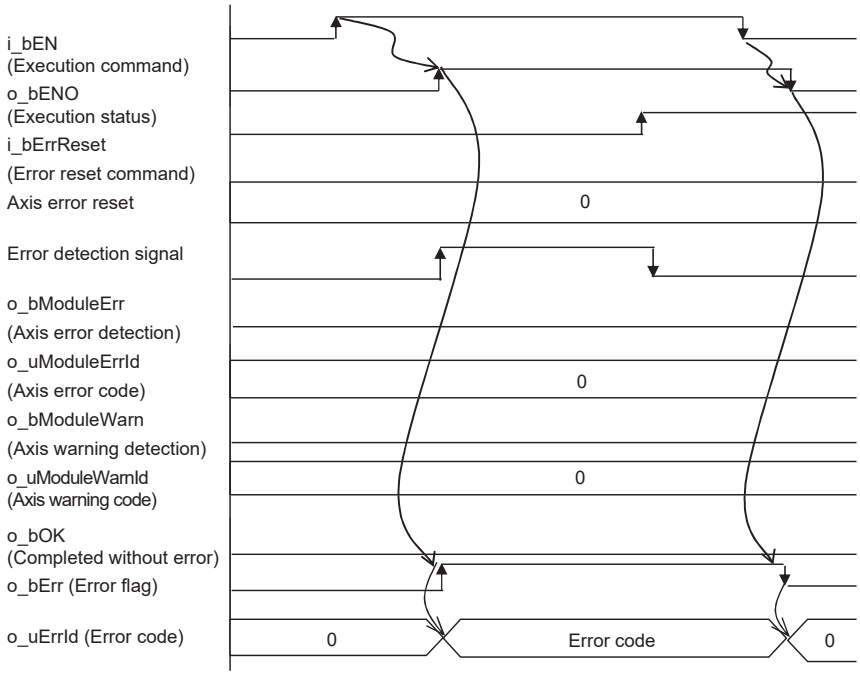
# 2.9 M+RD77_OperateError

## Name

M+RD77_OperateError

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Monitors errors and warnings, and resets errors. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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.<br>• When a module error occurs, an error code is stored in o_uModuleErrId (Axis error code).<br>• After i_bEN (Execution command) is turned ON, the generated error is reset by turning ON i_bErrReset (Error reset command).<br>• When a warning occurs in the module, the warning can be reset by turning ON i_bErrReset (Error reset command).<br>• 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<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Do not change i_uAxis (Target axis) while i_bEN (Execution command) is ON.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>The setting range differs depending on the module used. |
| Error reset command | i_bErrReset | Bit | ON, OFF | ON: Errors are reset.<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that resetting the error has been completed. |
| Axis error detection | o_bModuleErr | Bit | OFF | When ON, it indicates that an axis error has occurred. |
| Axis error code | o_uModuleErrId | Word [unsigned] | 0 | An error code of an error that has occurred in the module of the specified axis is stored. |
| Axis warning detection | o_bModuleWarn | Bit | OFF | When ON, it indicates that an axis warning has occurred. |
| Axis warning code | o_uModuleWarnId | Word [unsigned] | 0 | A warning code of a warning that has occurred in the module of the specified axis is stored. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The generated error code is stored. |

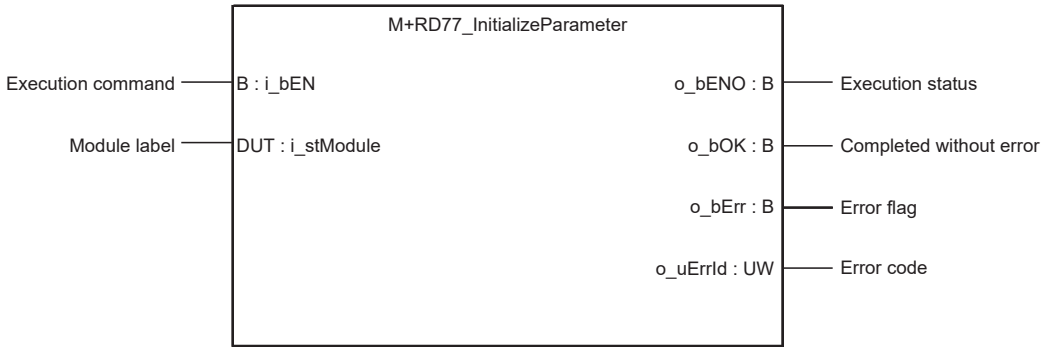
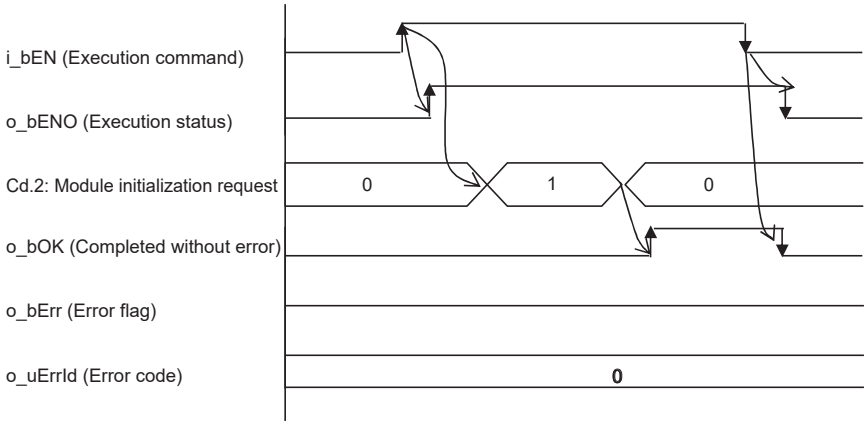
# 2.10 M+RD77_InitializeParameter



## Name

M+RD77_InitializeParameter

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Initializes the parameter. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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 execution type) | |
| Timing chart |  | |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• Every input must be provided with a value for proper FB operation.<br>• Before using this FB, make sure that the PLC READY signal (Y0) is OFF.<br>• After the setting data is initialized, reset the CPU module or restart the power of the programmable controller. | |

## Error codes

| Error code | Description | Action |
|---|---|---|
| None | None | None |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that initializing the parameter has been completed. |
| Error flag | o_bErr | Bit | OFF | Always OFF |
| Error code | o_uErrId | Word [unsigned] | 0 | Always 0 |

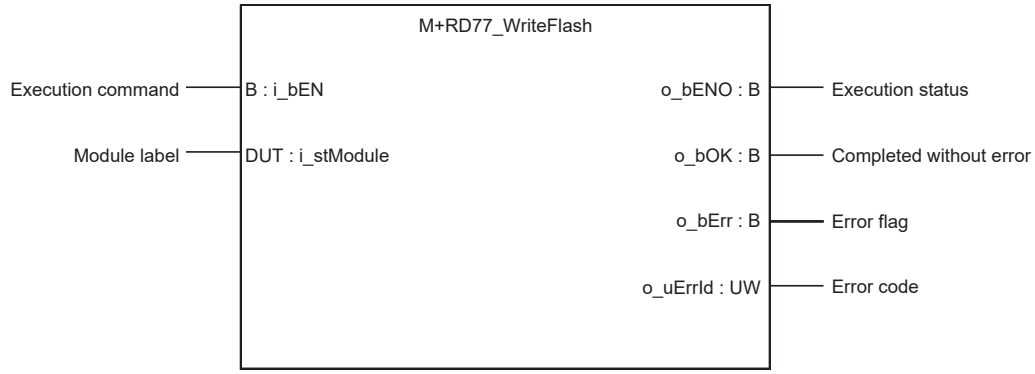
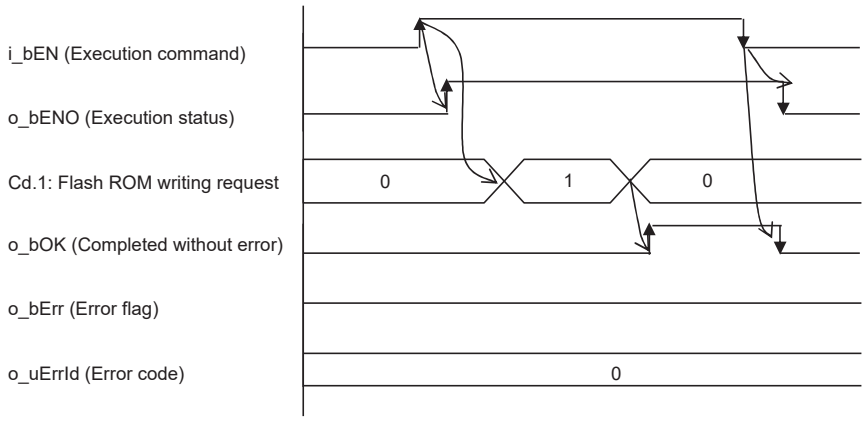
# 2.11 M+RD77_WriteFlash



## Name

M+RD77_WriteFlash

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Writes the parameter, positioning data, and block start data in the buffer memory to the flash ROM. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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 execution type) | |
| Timing chart |  | |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• Every input must be provided with a value for proper FB operation.<br>• Before using this FB, make sure that the PLC READY signal (Y0) is OFF. | |

## Error codes

| Error code | Description | Action |
|---|---|---|
| None | None | None |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that writing the setting data to the flash ROM has been completed. |
| Error flag | o_bErr | Bit | OFF | Always OFF |
| Error code | o_uErrId | Word [unsigned] | 0 | Always 0 |

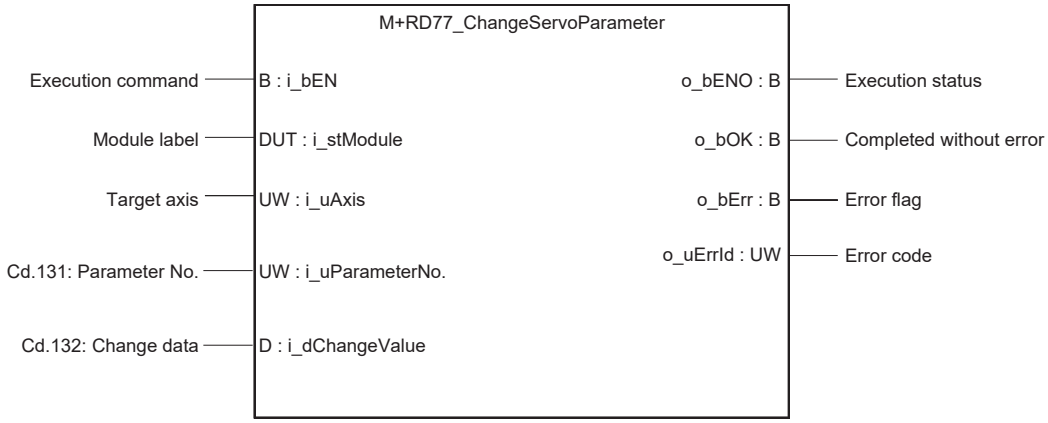
# 2.12 M+RD77_ChangeServoParameter

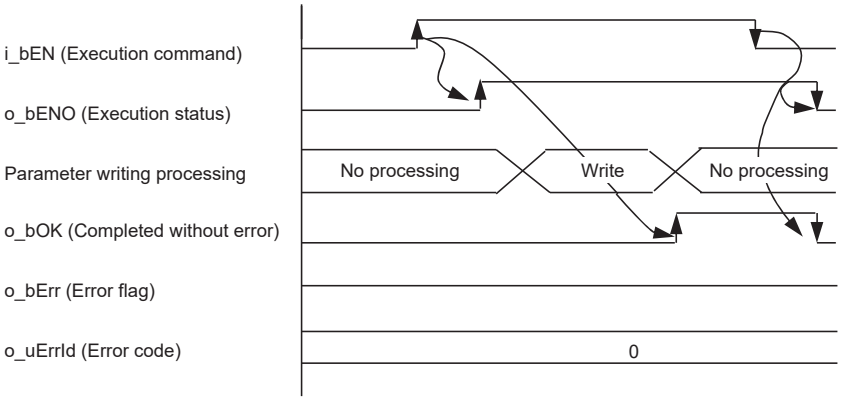
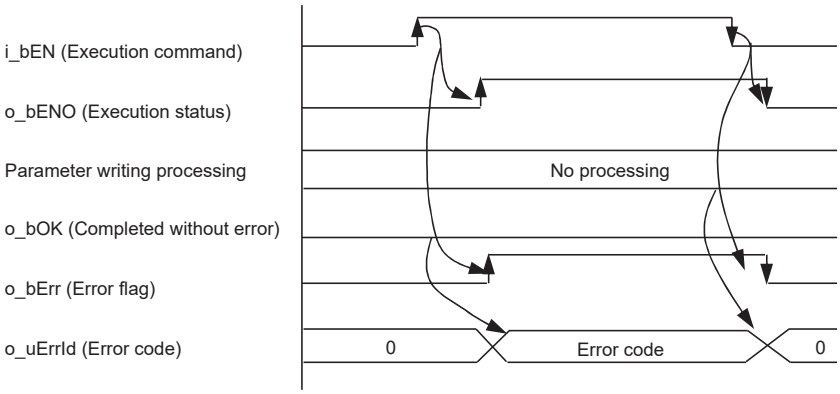
## Name

M+RD77_ChangeServoParameter



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the servo parameter after the amplifier is activated. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 236 steps | |
| Function description | • By turning ON i_bEN (Execution command), the servo parameter after the amplifier is started is changed.<br>• When the target axis of the input label is incorrectly set, o_bErr turns ON and the error code is stored in o_bErrId. | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

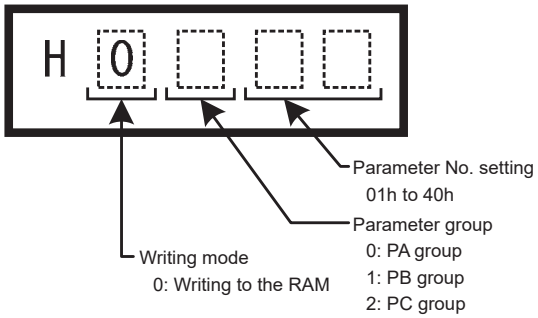
| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• 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.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the target axis.<br>• Every input must be provided with a value for proper FB operation.<br>• Before using this FB, make sure that communication with the servo amplifier is established.<br>• When this FB fails writing the parameter, o_bOK (Completed without error) does not turn ON.<br>• The setting items and range differ depending on the module used in the system. |

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>The setting range differs depending on the module used. |
| Cd.131: Parameter No. | i_uParameterNo | Word [unsigned] | H0001 to H0C40 | Set the servo parameter No. to be changed.<br>Set the data in the same specifications as [Cd.131] of the system control data.<br>Even when the data No. different from the data specifications of [Cd.131] is specified, the execution of this FB is completed normally.<br>In this case, an error may occur in the simple motion module.<br>The following figure shows the data specifications of [Cd.131].<br>Setting value<br>  <br> |
| Cd.132: Change data | i_dChangeValue | Double word [signed] | Refer to the servo amplifier manual and instruction manual. | Set the servo parameter value to be changed.<br>Lower 1 word is valid. |

### ■Output labels

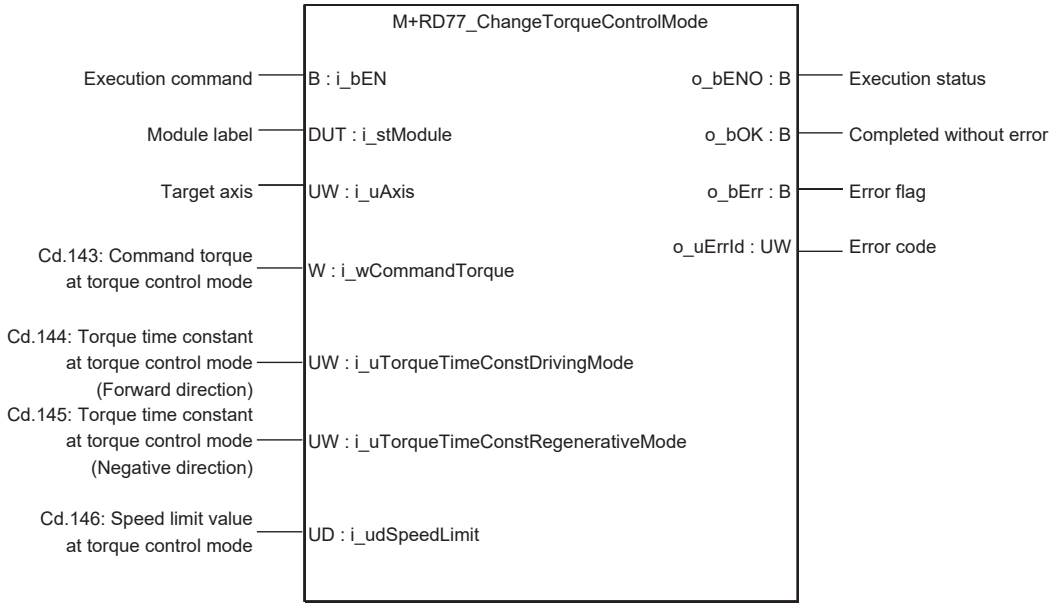
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that changing the servo parameter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

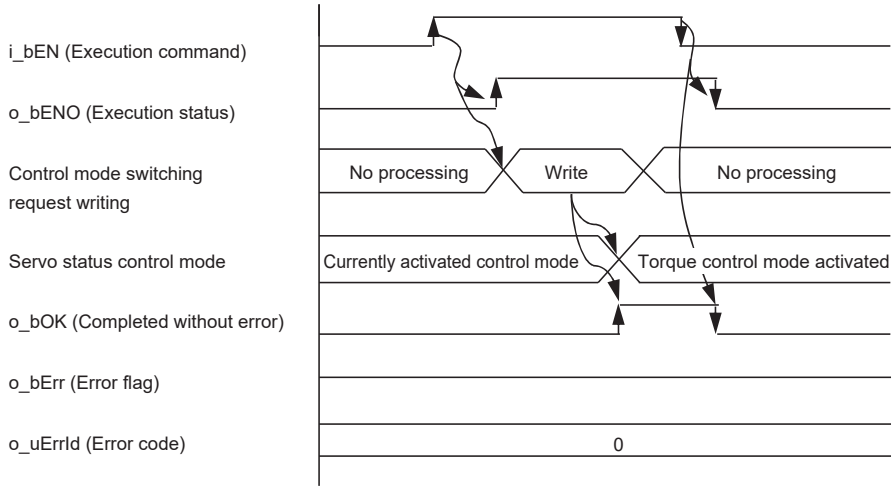
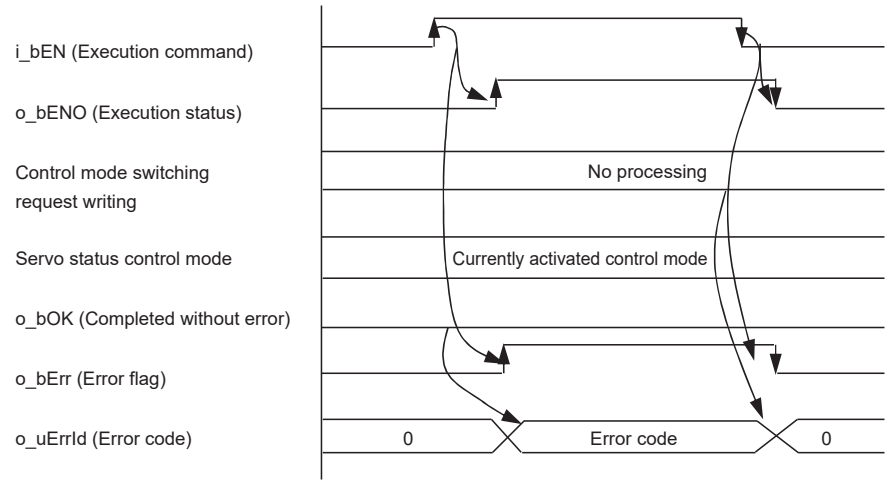
# 2.13 M+RD77_ChangeTorqueControlMode

## Name

M+RD77_ChangeTorqueControlMode

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Activates the torque control mode. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 347 steps | |
| Function description | • By turning ON i_bEN (Execution command), the torque control mode is activated for the specified axis.<br>• When this FB is executed under torque control, the command torque and speed limit value are changed.<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>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<br>(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<br>(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<br>• 0 to 2000000000<br>Pr.1: Unit setting = inch<br>• 0 to 2000000000<br>Pr.1: Unit setting = degree<br>• 0 to 2000000000<br>Pr.1: Unit setting = pulse<br>• 0 to 1000000000 | 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.<br>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_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

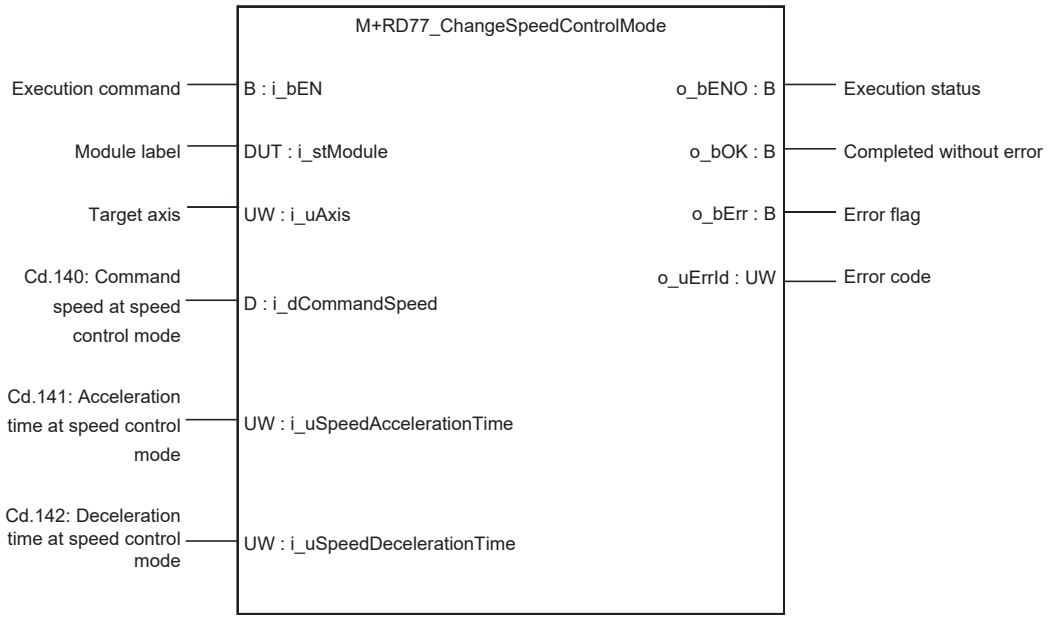
# 2.14 M+RD77_ChangeSpeedControlMode

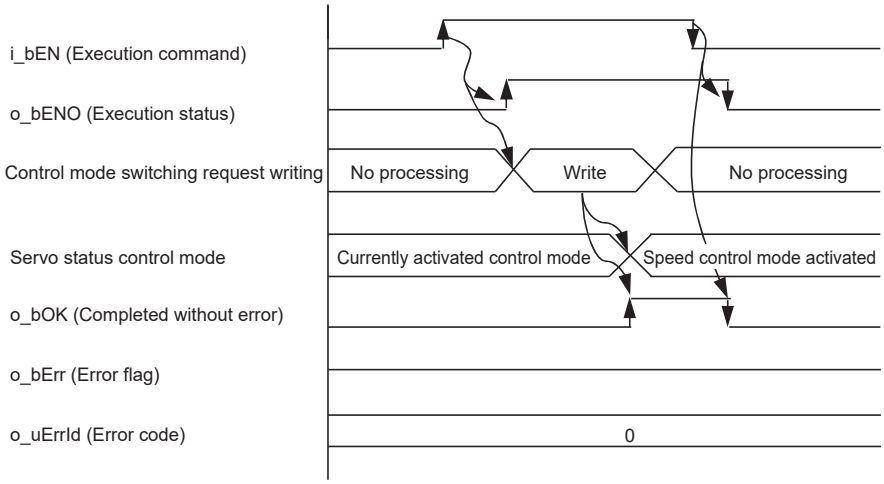
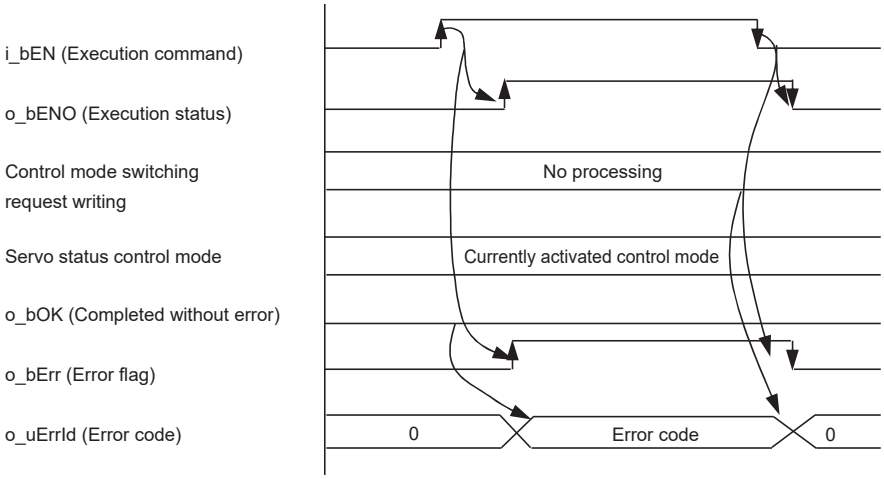


## Name

M+RD77_ChangeSpeedControlMode

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Activates the speed control mode. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 303 steps | |
| Function description | • By turning ON i_bEN (Execution command), the speed control mode is activated for the specified axis.<br>• When this FB is executed under speed control, the command speed is changed.<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>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<br>• -2000000000 to +2000000000<br>Pr.1: Unit setting = inch<br>• -2000000000 to +2000000000<br>Pr.1: Unit setting = degree<br>• -2000000000 to +2000000000<br>Pr.1: Unit setting = pulse<br>• -1000000000 to +1000000000 | Set the command speed at speed control mode. |
| Cd.141: Acceleration time at speed control mode | i_uSpeedAccelerationTime | Word [unsigned] | 0 to 65535<br>(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<br>(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

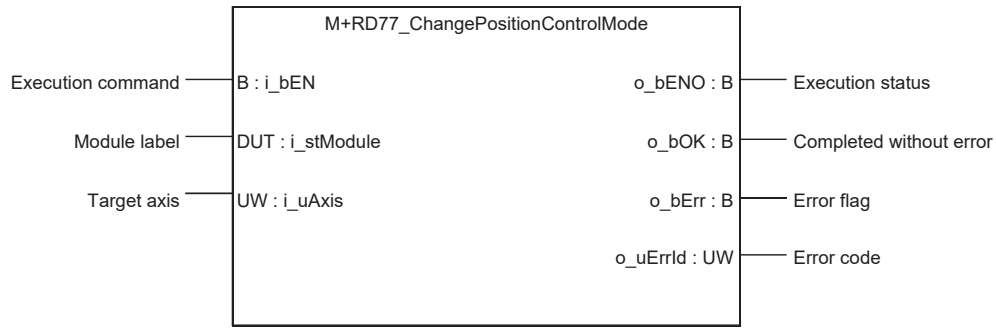
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that changing control mode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

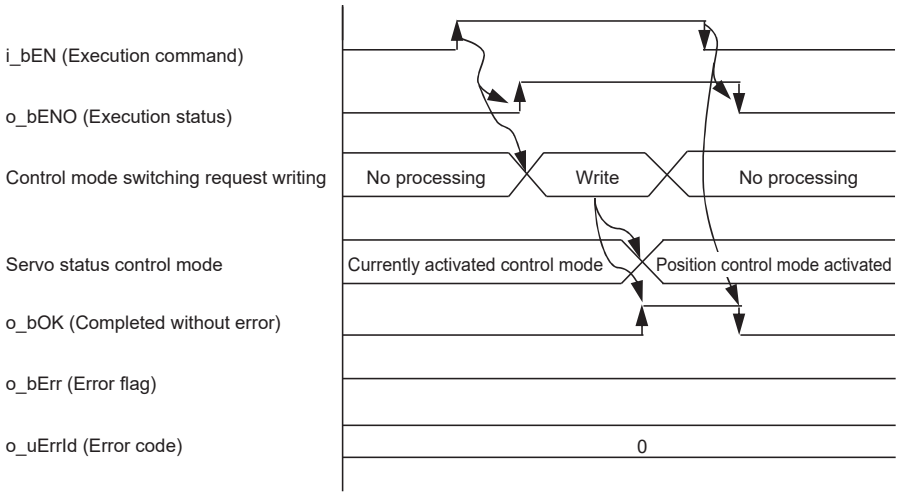
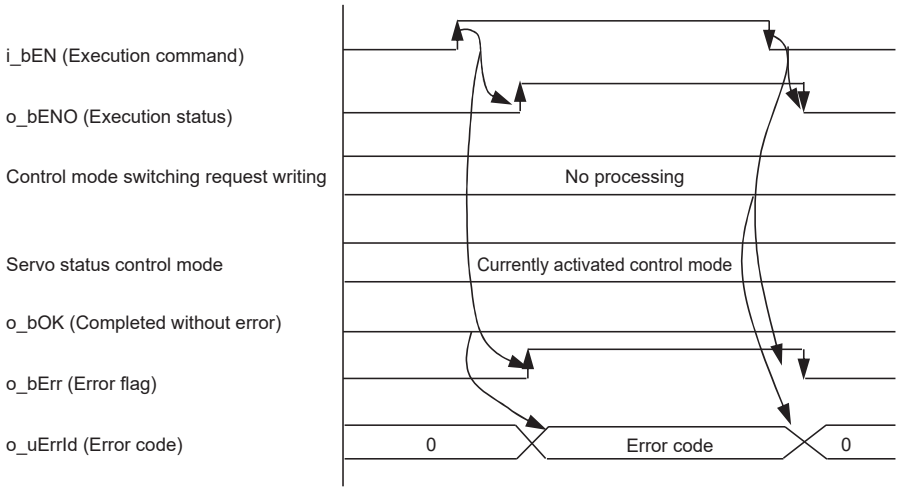
# 2.15 M+RD77_ChangePositionControlMode

## Name

M+RD77_ChangePositionControlMode

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Activates the position control mode. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 347 steps | |
| Function description | • By turning ON i_bEN (Execution command), the position control mode is activated for the specified axis.<br>• When this FB is executed during position control, the execution is completed without any processing.<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>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.<br>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_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

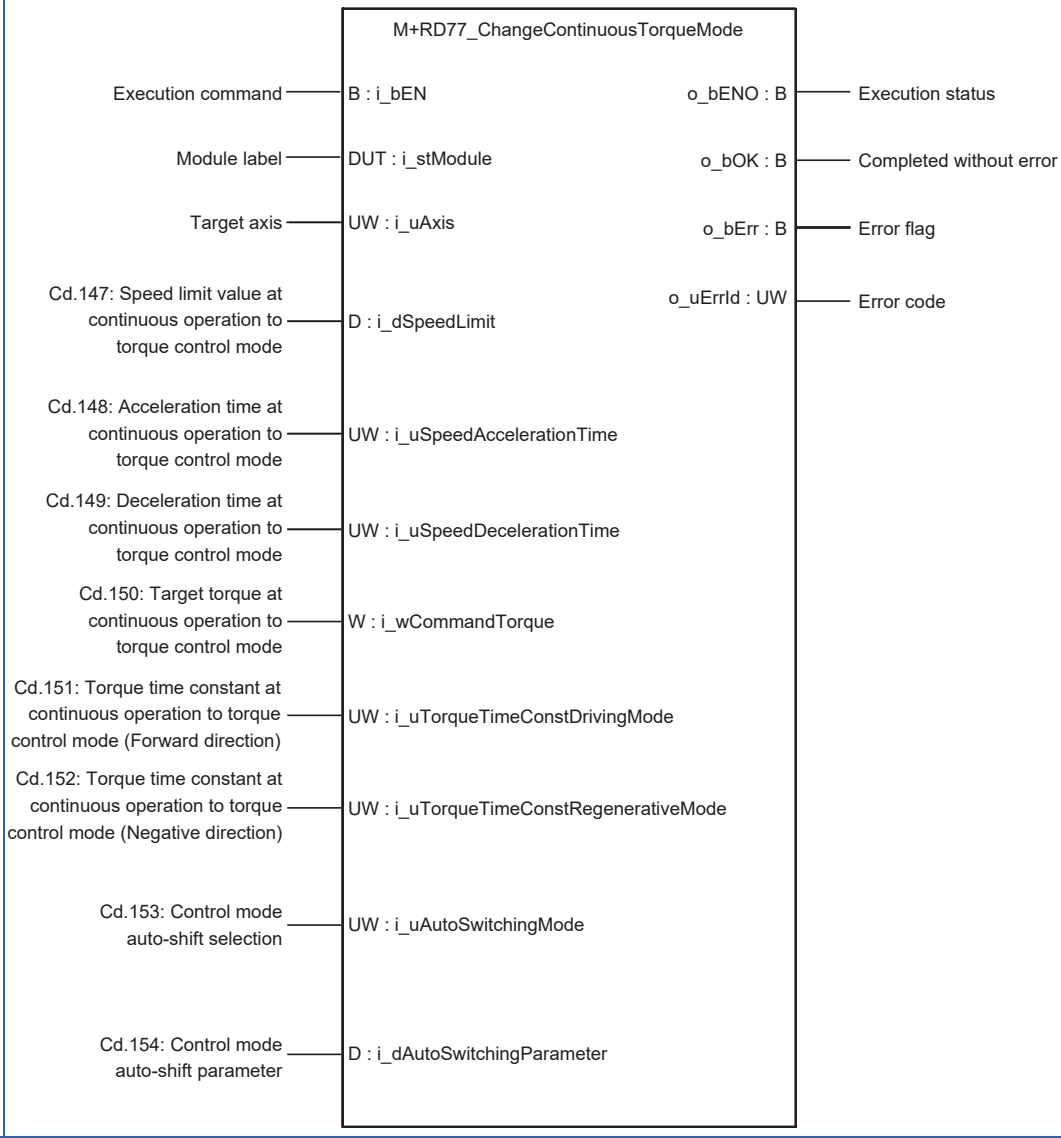
# 2.16 M+RD77_ChangeContinuousTorqueMode

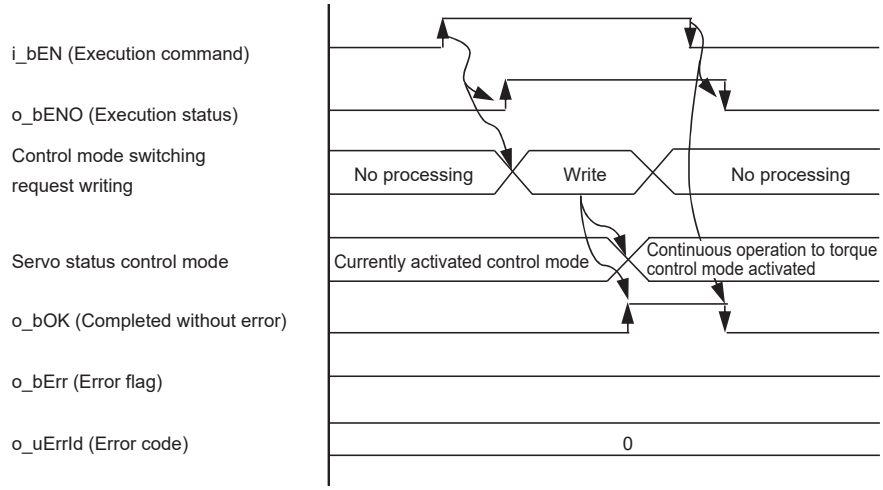
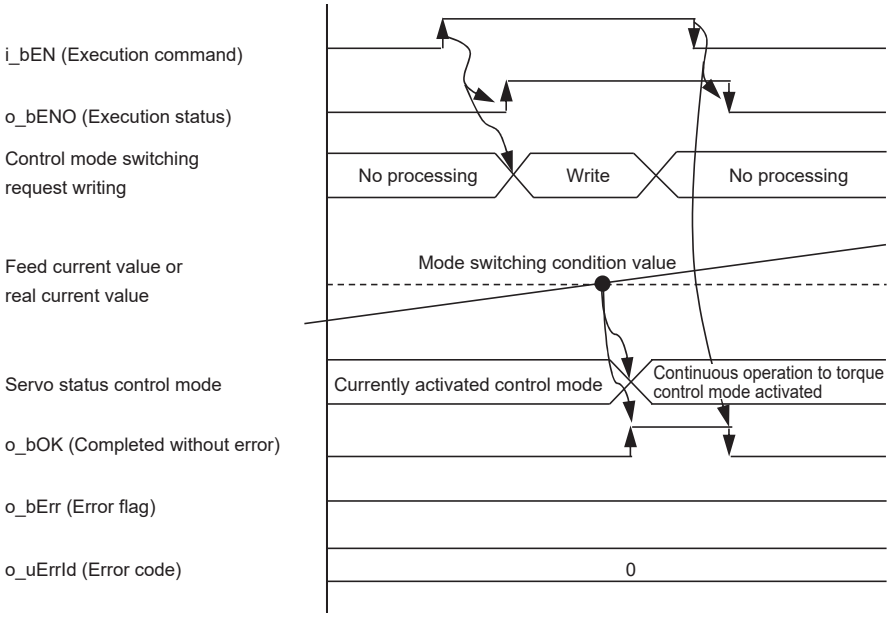
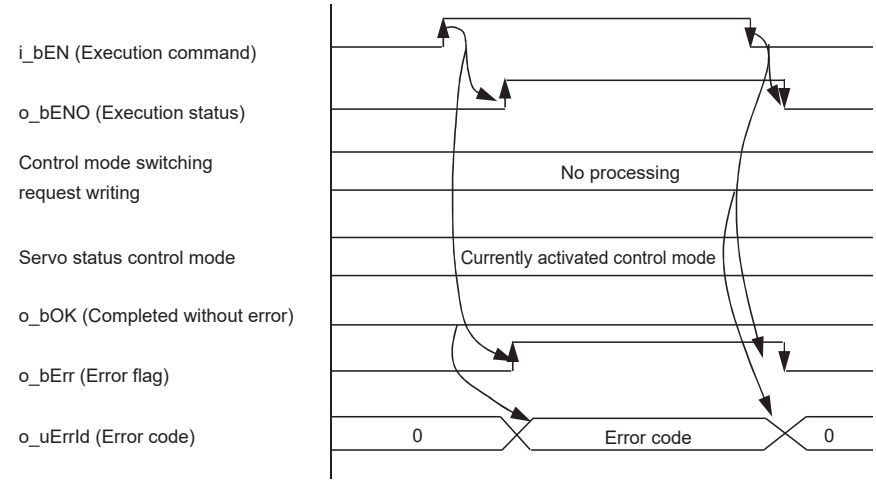
## Name

M+RD77_ChangeContinuousTorqueMode



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Activates the continuous operation to torque control mode. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 523 steps | |
| Function description | • By turning ON i_bEN (Execution command), the continuous operation to torque control mode is activated for the specified axis.<br>• When this FB is executed during continuous operation to torque control mode, the speed limit value and target torque are changed.<br>• When the setting value of the target axis is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>• When the control mode auto-shift selection is set to 0<br>  <br><br>• When the control mode auto-shift selection is set to other than 0<br>  <br><br>When an error occurs<br>  <br> |

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



## Error codes

| Error code | Description | Action |
|---|---|---|
| 100 (Hexadecimal) | The setting value of i_uAxis (Target axis) is out of the range. The target axis is not within the range of 1 to 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.<br>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 No.<br>The setting range differs depending on the module used. |
| Cd.147: Speed limit value at continuous operation to torque control mode | i_dSpeedLimit | Double word [signed] | Pr.1: Unit setting = mm<br>• -2000000000 to +2000000000<br>Pr.1: Unit setting = inch<br>• -2000000000 to +2000000000<br>Pr.1: Unit setting = degree<br>• -2000000000 to +2000000000<br>Pr.1: Unit setting = pulse<br>• -1000000000 to +1000000000 | Set the speed limit value at continuous operation to torque control mode. |
| Cd.148: Acceleration time at continuous operation to torque control mode | i_uSpeedAccelerationTime | Word [unsigned] | 0 to 65535<br>(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<br>(0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.) | Set the deceleration time at continuous operation to torque control mode. |
| Cd.150: Target torque at continuous operation to torque control mode | i_wCommandTorque | Word [signed] | -10000 to 10000 | Set the target torque at continuous operation to torque control mode. |
| Cd.151: Torque time constant at continuous operation to torque control mode (Forward direction) | i_uTorqueTimeConstDrivingMode | Word [unsigned] | 0 to 65535<br>(0 to 32767: Set by decimal number. 32768 to 65535: Convert the number to hexadecimal number and set.) | Set the time constant for the driving at continuous operation to torque control mode. |
| Cd.152: Torque time constant at continuous operation to torque control mode (Negative direction) | i_uTorqueTimeConstRegenerativeMode | Word [unsigned] | 0 to 65535<br>(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<br>• -2147483648 to +2147483648<br>Pr.1: Unit setting = inch<br>• -2147483648 to +2147483648<br>Pr.1: Unit setting = degree<br>• 0 to 35999999<br>Pr.1: Unit setting = pulse<br>• -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.<br>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_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

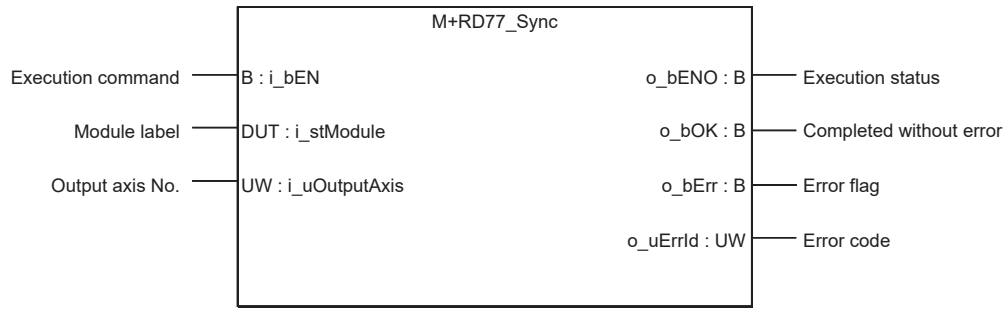
# 2.17 M+RD77_Sync

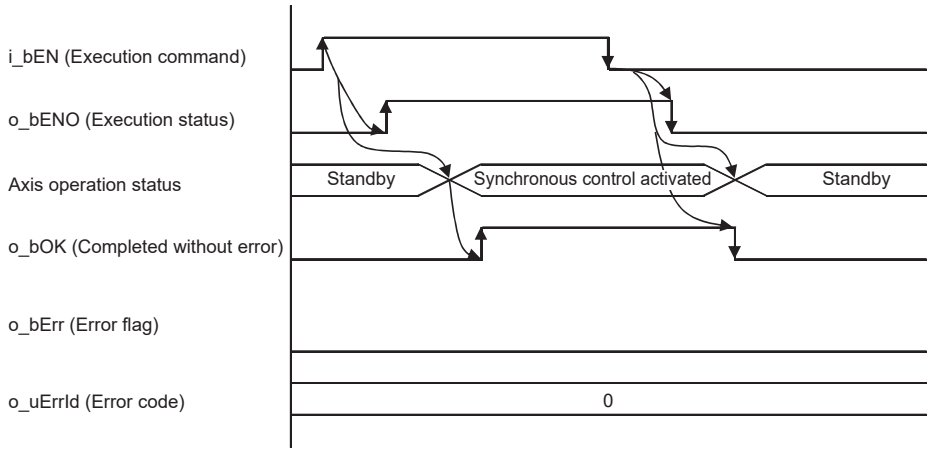
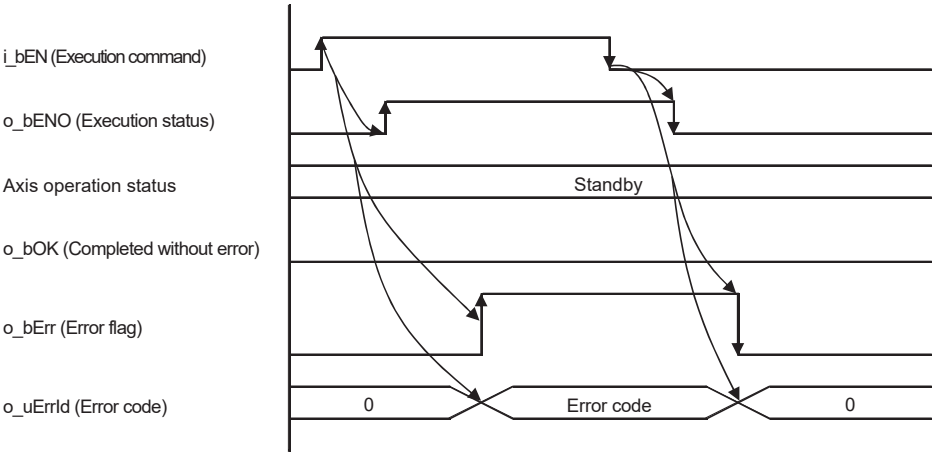


## Name

M+RD77_Sync

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Starts and ends the synchronous control. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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.<br>• When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• 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 | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the output axis No.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. for which synchronous control is started.<br>The setting range differs depending on the module used. |

### ■Output labels

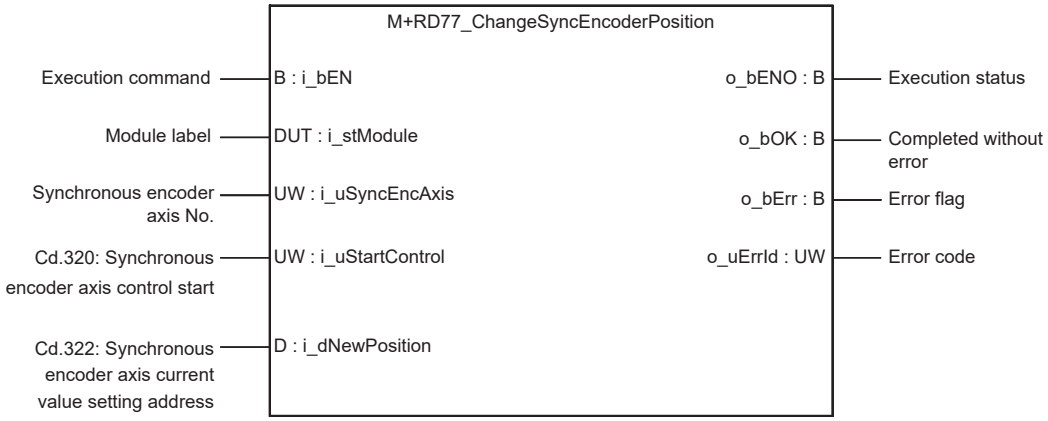
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that synchronous control has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

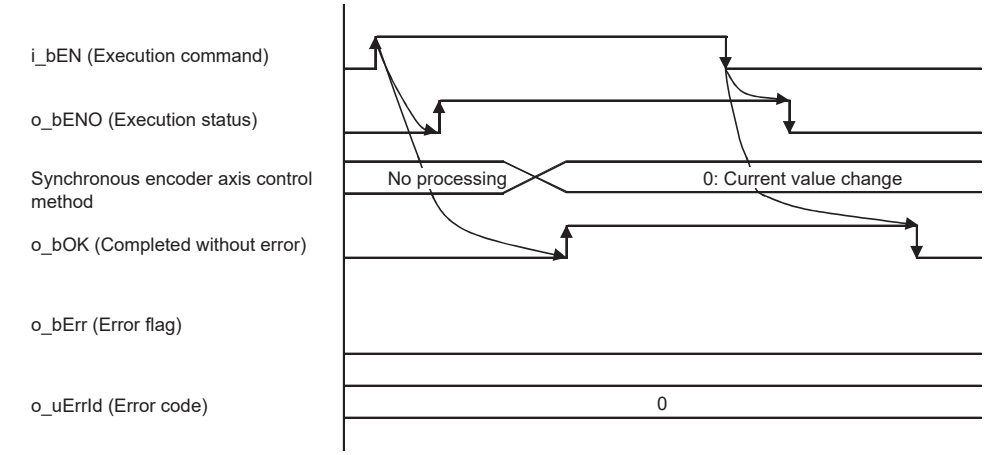
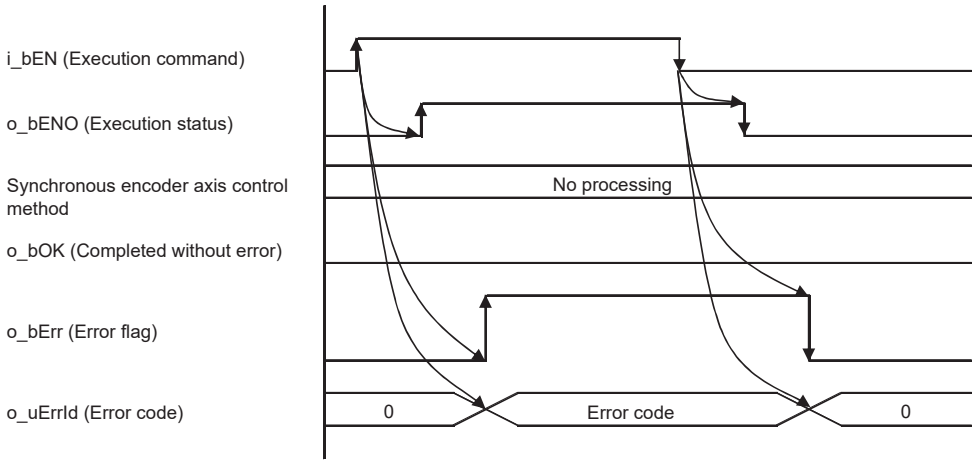
# 2.18 M+RD77_ChangeSyncEncoderPosition

## Name

M+RD77_ChangeSyncEncoderPosition

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the synchronous encoder axis current value and synchronous encoder axis current value per cycle. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 215 steps | |
| Function description | • The operation method differs depending on the setting value of the synchronous encoder axis control start. When the setting value is 1, the synchronous encoder axis current value is changed by turning ON i_bEN (Execution command). When the setting value is 101 to 116, the synchronous encoder axis current value is changed by the high speed input request [DI] after i_bEN (Execution command) is turned ON.<br>• When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (single scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. | Set the synchronous encoder axis No. 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<br>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.<br>When 101 to 116 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal).<br>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<br>• -2147483648 to 2147483647<br>Pr.321: Unit setting = inch<br>• -2147483648 to 2147483647<br>Pr.321: Unit setting = degree<br>• -2147483648 to 2147483647<br>Pr.321: Unit setting = pulse<br>• -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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that setting the synchronous encoder axis current value change has been completed. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

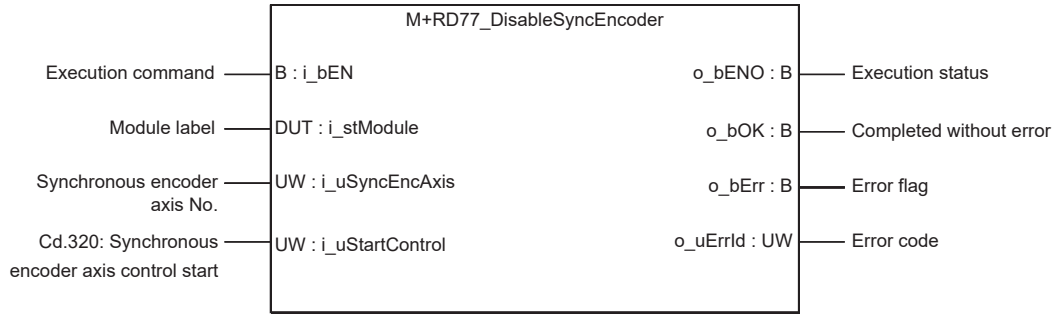
# 2.19 M+RD77_DisableSyncEncoder

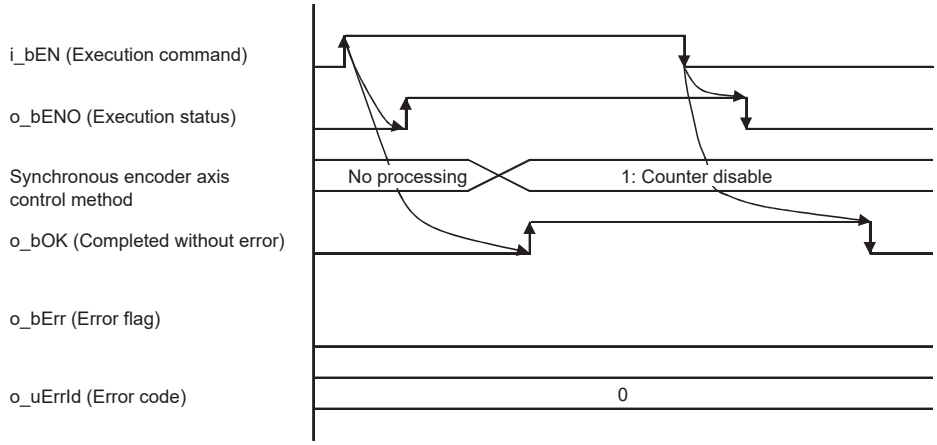
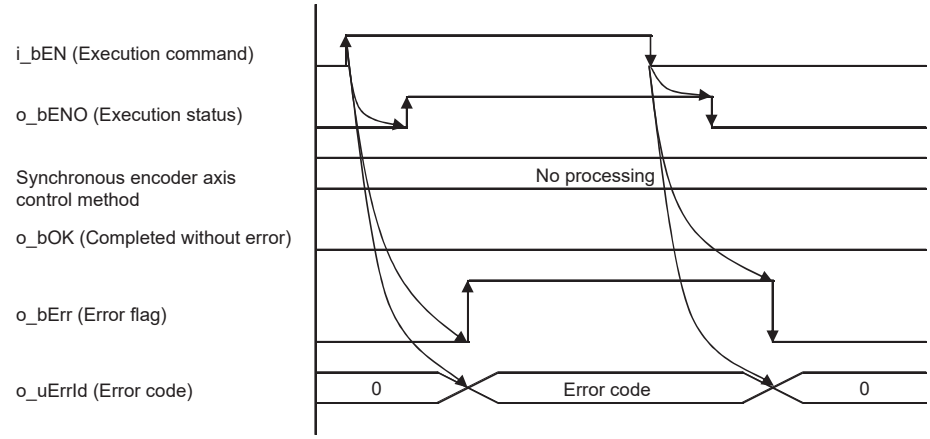
## Name

M+RD77_DisableSyncEncoder



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Disables inputs from the synchronous encoder axis. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 170 steps | |
| Function description | • The operation method differs depending on the setting value of the synchronous encoder axis control start. When the setting value is 1, the synchronous encoder axis counter is disabled by turning ON i_bEN (Execution command). When the setting value is 101 to 116, the synchronous encoder axis counter is disabled by the high speed input request [DI] after i_bEN (Execution command) is turned ON.<br>• When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (single scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. | Set the synchronous encoder axis No. whose inputs are to be disabled. |
| Cd.320: Synchronous encoder axis control start | i_uStartControl | Word [unsigned] | 1: Start for synchronous encoder axis control<br>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.<br>When 101 to 116 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal).<br>The setting range differs depending on the module used. |

### ■Output labels

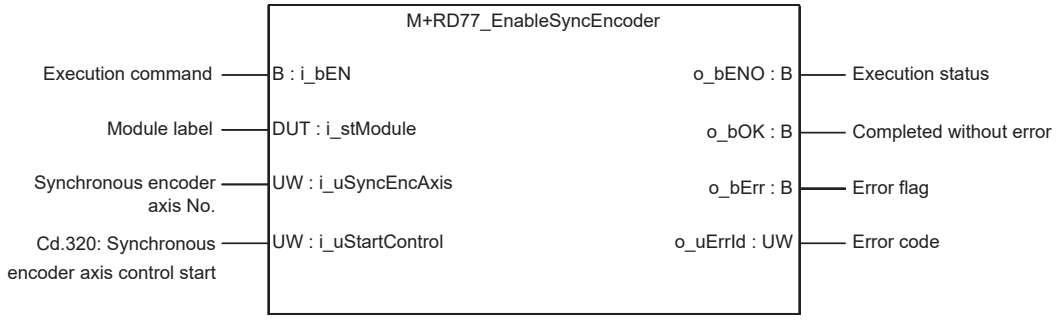
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that disabling the synchronous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

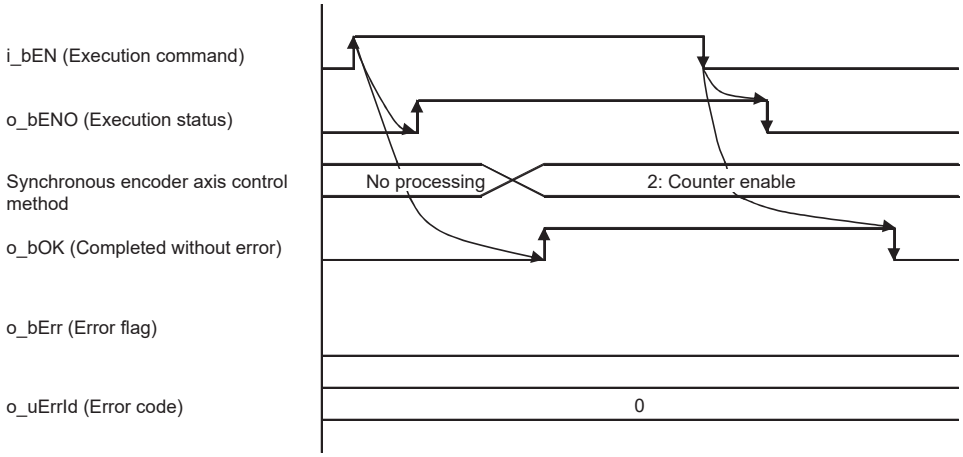
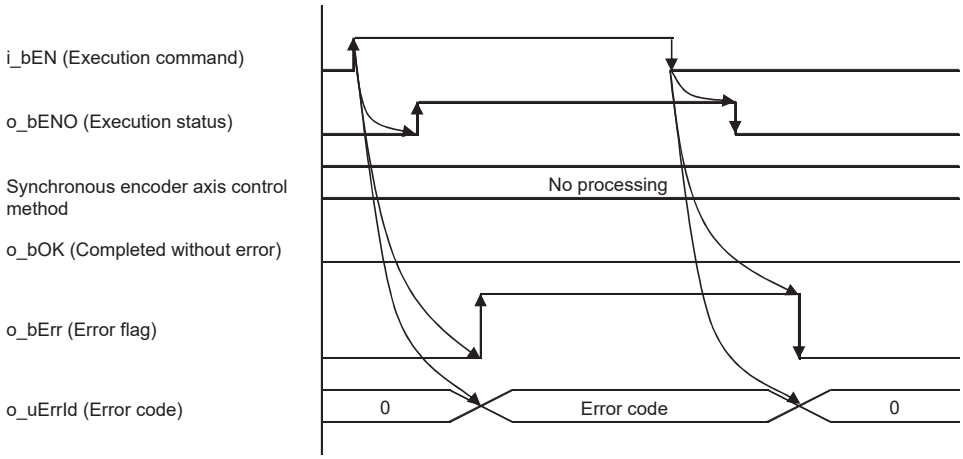
# 2.20 M+RD77_EnableSyncEncoder

## Name

M+RD77_EnableSyncEncoder

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Enables inputs from the synchronous encoder axis. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 170 steps | |
| Function description | • The operation method differs depending on the setting value of the synchronous encoder axis control start. When the setting value is 1, the synchronous encoder axis counter is enabled by turning ON i_bEN (Execution command). When the setting value is 101 to 116, the synchronous encoder axis counter is enabled by the high speed input request [DI] after i_bEN (Execution command) is turned ON.<br>• When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (single scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. | Set the synchronous encoder axis No. whose inputs are to be enabled. |
| Cd.320: Synchronous encoder axis control start | i_uStartControl | Word [unsigned] | 1: Start for synchronous encoder axis control<br>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.<br>When 101 to 116 is set, the synchronous encoder axis control starts based on the high-speed input request (external command signal).<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that enabling the synchronous encoder axis counter has been completed. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

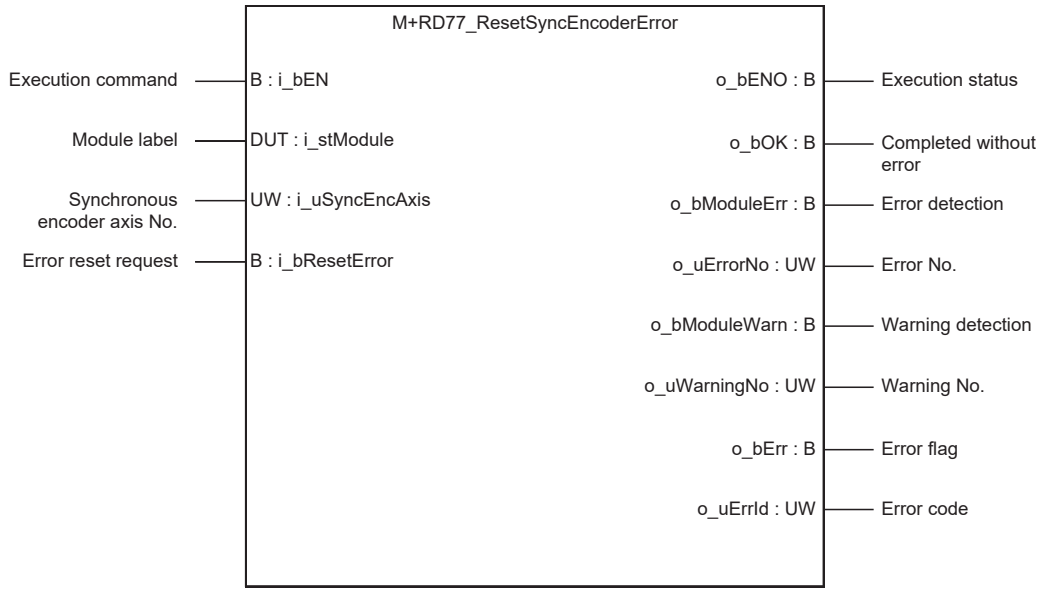
# 2.21 M+RD77_ResetSyncEncoderError

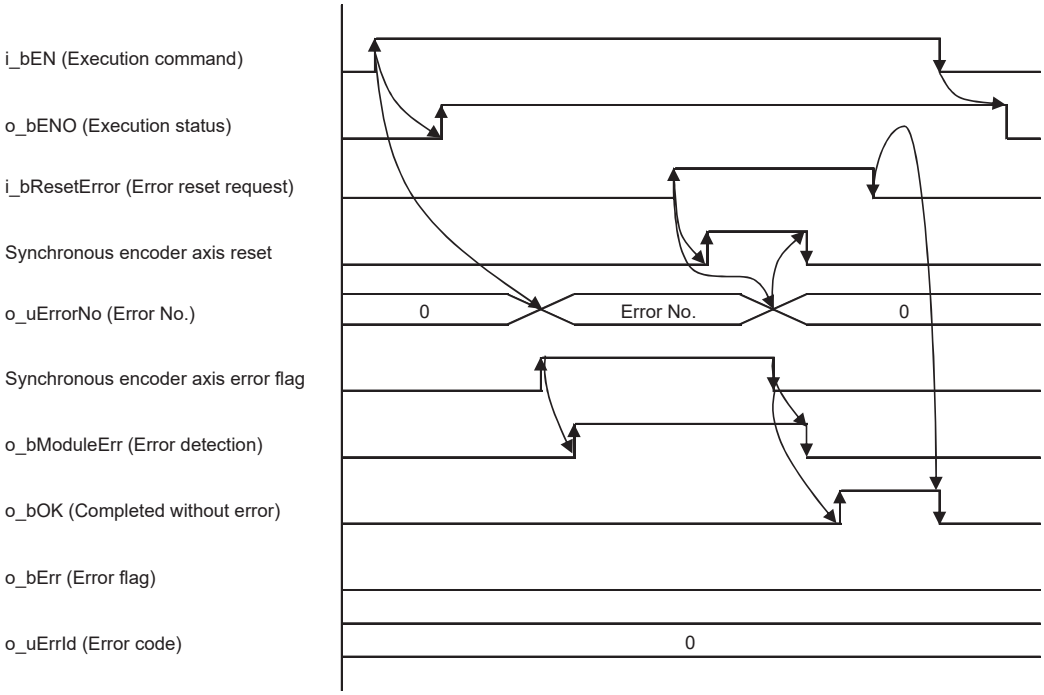
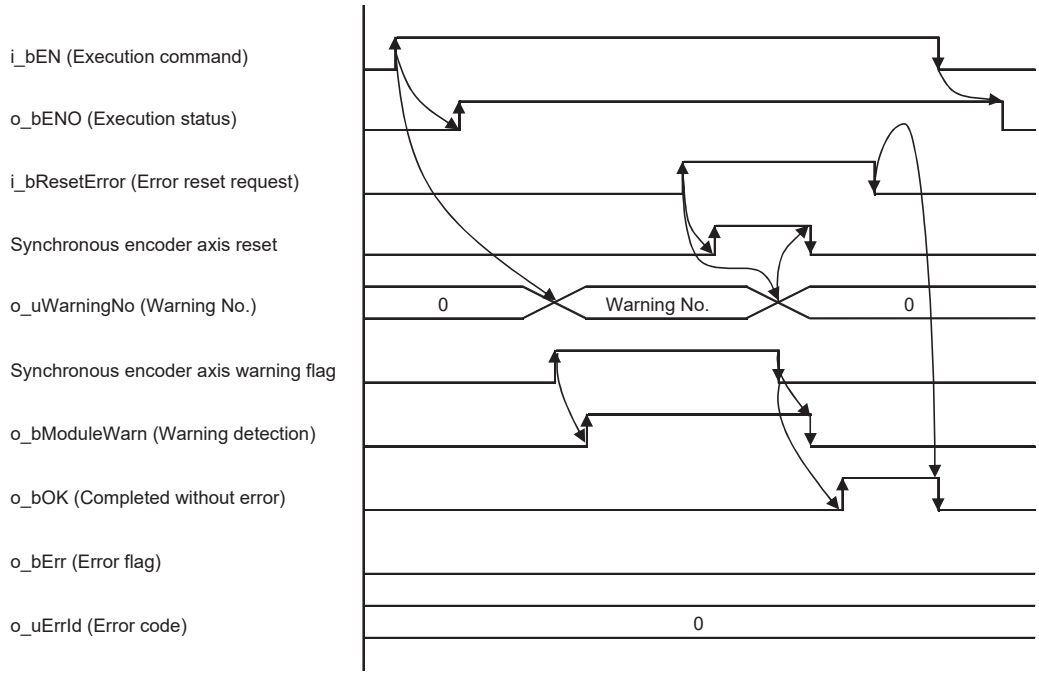
## Name

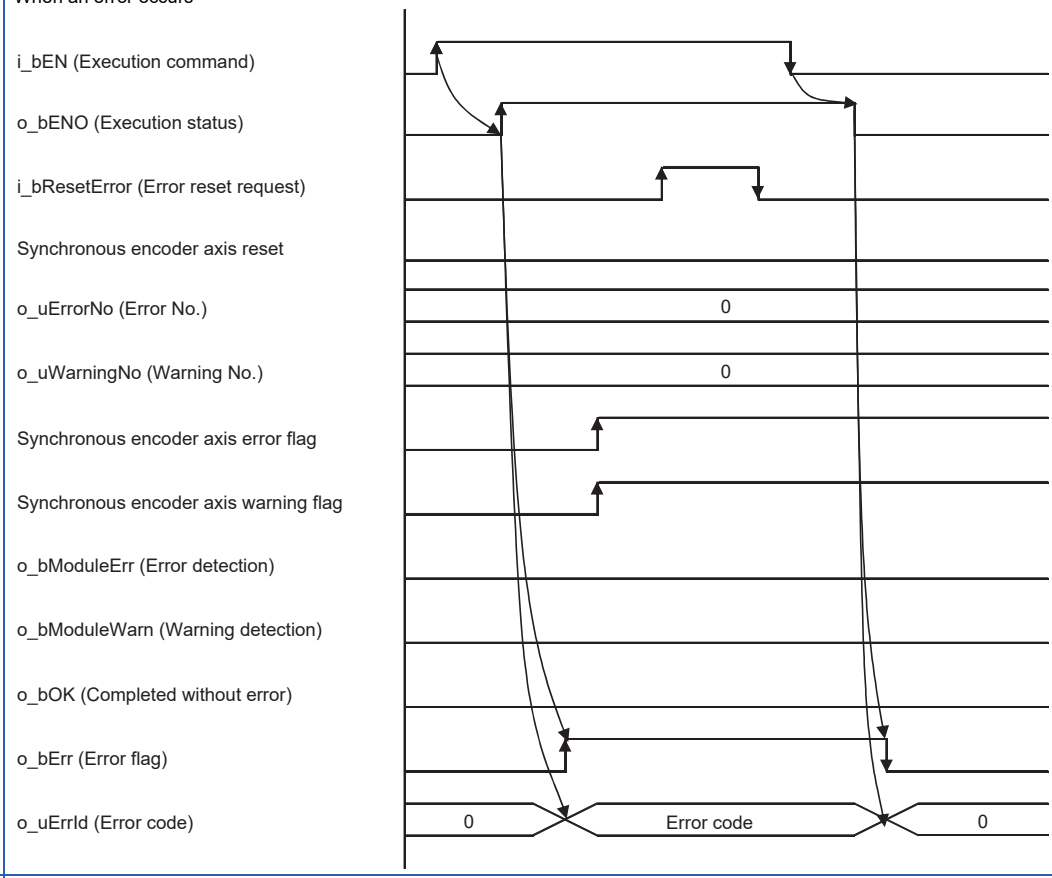
M+RD77_ResetSyncEncoderError



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Reads error information from the synchronous encoder axis, and resets the error. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 360 steps | |
| Function description | • By turning ON i_bEN (Execution command), the synchronous encoder axis error and warning information of the synchronous encoder axis No. are read.<br>• When the error reset request is ON, the error and warning are reset.<br>• When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Real-time execution | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error (error reset)<br>  <br><br>When operation completes without an error (warning reset)<br>  <br> |

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

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. 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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that the error detection flag and warning detection flag of the synchronous encoder axis status have been turned OFF. |
| Error detection | o_bModuleErr | Bit | OFF | When ON, it indicates that the synchronous encoder axis error has occurred. |
| Error No. | o_uErrorNo | Word [unsigned] | 0 | When the synchronous encoder axis error is detected, the error code corresponding to the error is stored. |
| Warning detection | o_bModuleWarn | Bit | OFF | When ON, it indicates that the synchronous encoder axis warning has occurred. |
| Warning No. | o_uWarningNo | Word [unsigned] | 0 | When the synchronous encoder axis warning is detected, the warning code corresponding to the warning is stored. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

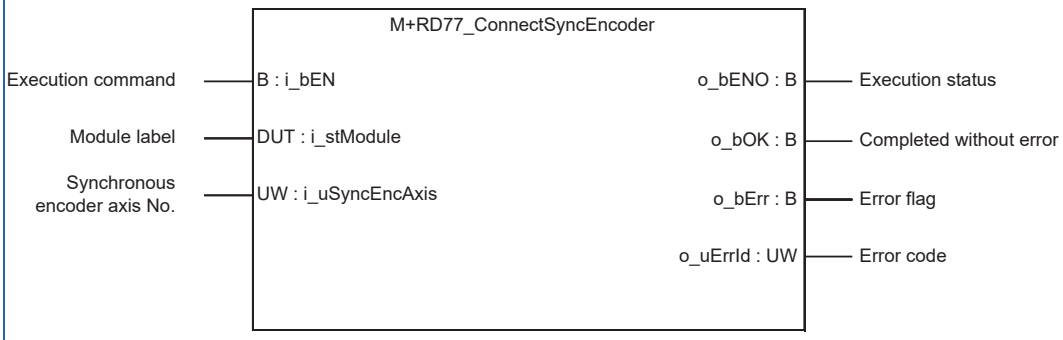
# 2.22 M+RD77_ConnectSyncEncoder

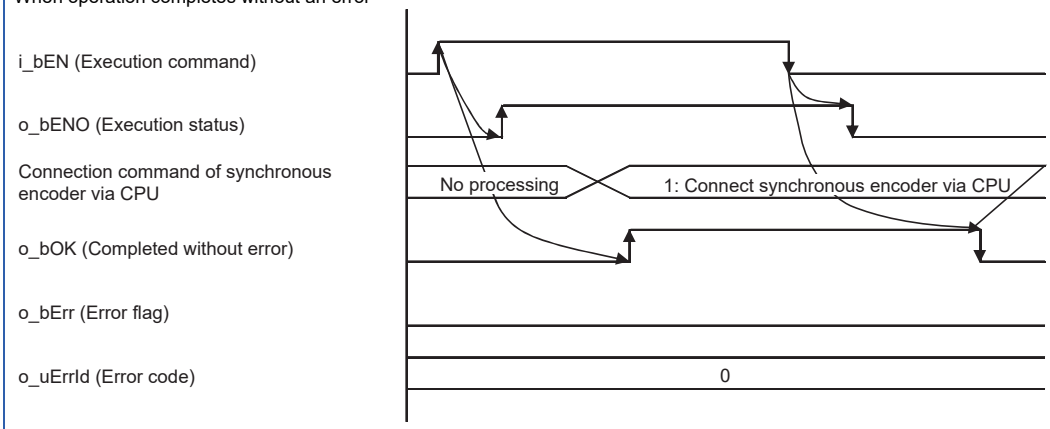
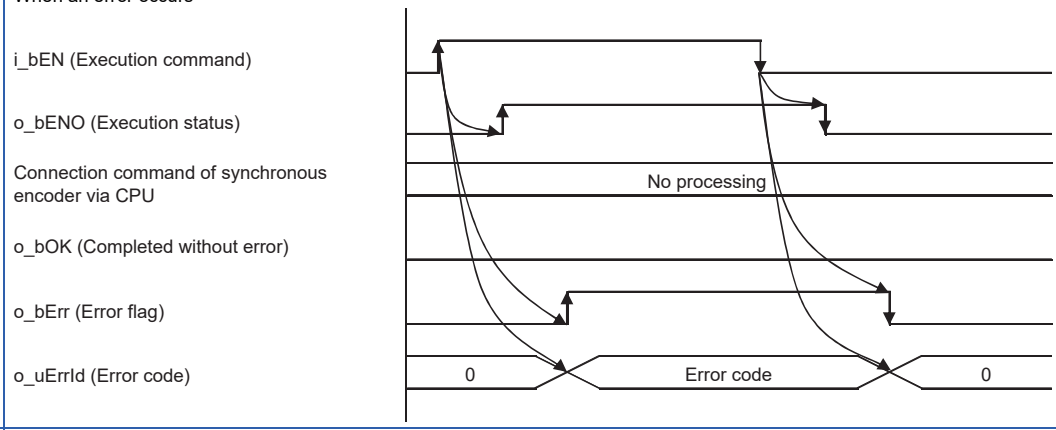


## Name

M+RD77_ConnectSyncEncoder

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Connects a synchronous encoder via CPU. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 176 steps | |
| Function description | • By turning ON i_bEN (Execution command), the synchronous encoder of the synchronous encoder axis No. is connected via CPU.<br>• When the setting value of the synchronous encoder axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for the synchronous encoder axis for which the synchronous encoder axis enabled flag is OFF, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 301 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

| Item | Description |
|---|---|
| Timing chart | When operation completes without an error<br>  <br><br>When an error occurs<br>  <br> |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• The FB cannot be used in an interrupt program.<br>• When this FB is used twice or more, precaution must be taken to avoid repetition of the synchronous encoder axis No.<br>• Every input must be provided with a value for proper FB operation. |

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. for which the connection command of the synchronous encoder via CPU is executed. |

### ■Output labels

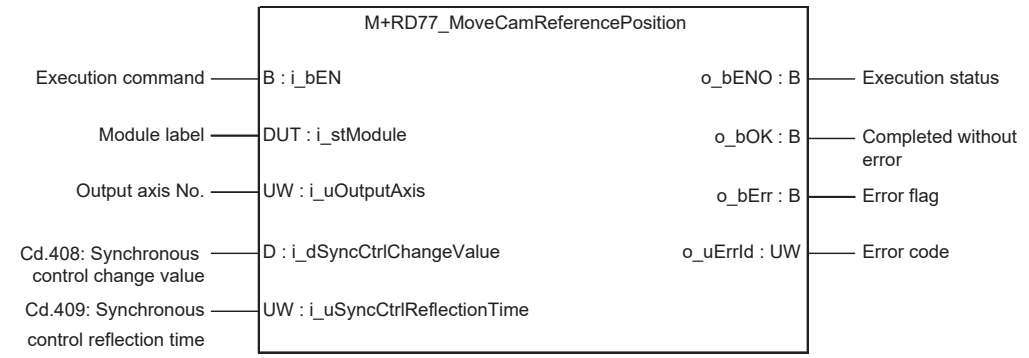
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that the connecting valid flag 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_Id | Word [unsigned] | 0 | The error code generated in the FB is stored. |

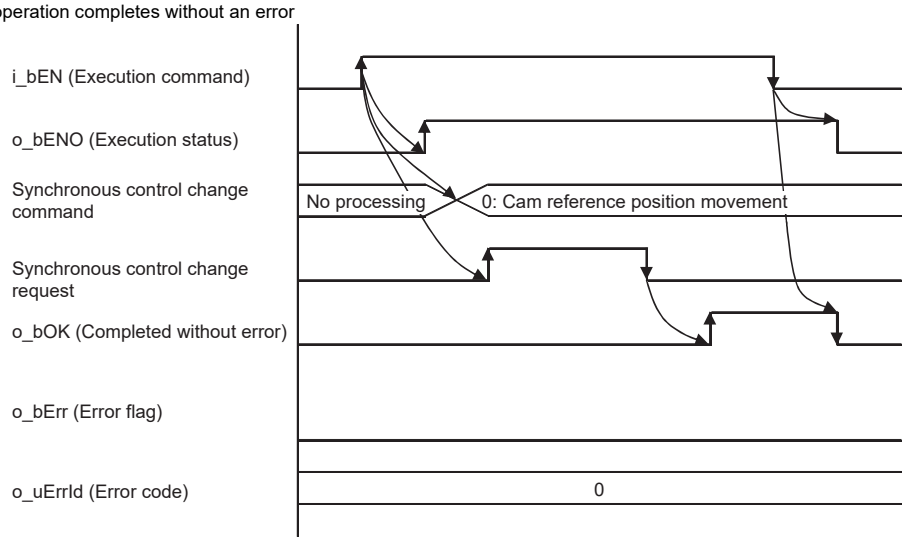
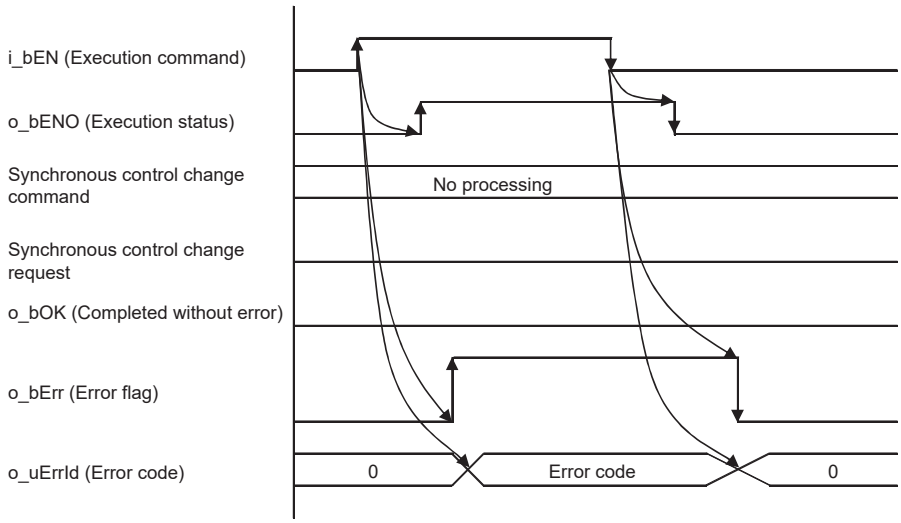
# 2.23 M+RD77_MoveCamReferencePosition

## Name

M+RD77_MoveCamReferencePosition

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Adds the movement amount set in the synchronous control change value to the cam reference position to move the cam reference position. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 355 steps | |
| Function description | • By turning ON i_bEN (Execution command), the cam reference position of the output axis No. is moved.<br>• 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.<br>• When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for an output axis No. for which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. whose cam reference position is to be moved.<br>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)<br>(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.<br>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_Id | Word [unsigned] | 0 | The error code generated in the FB is stored. |

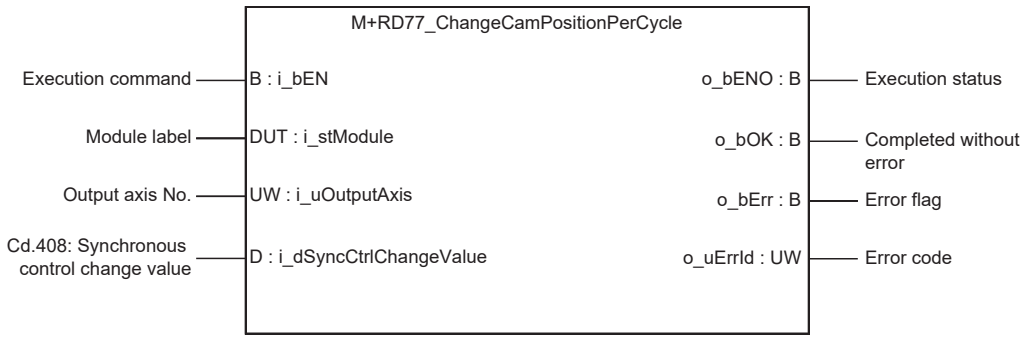
# 2.24 M+RD77_ChangeCamPositionPerCycle

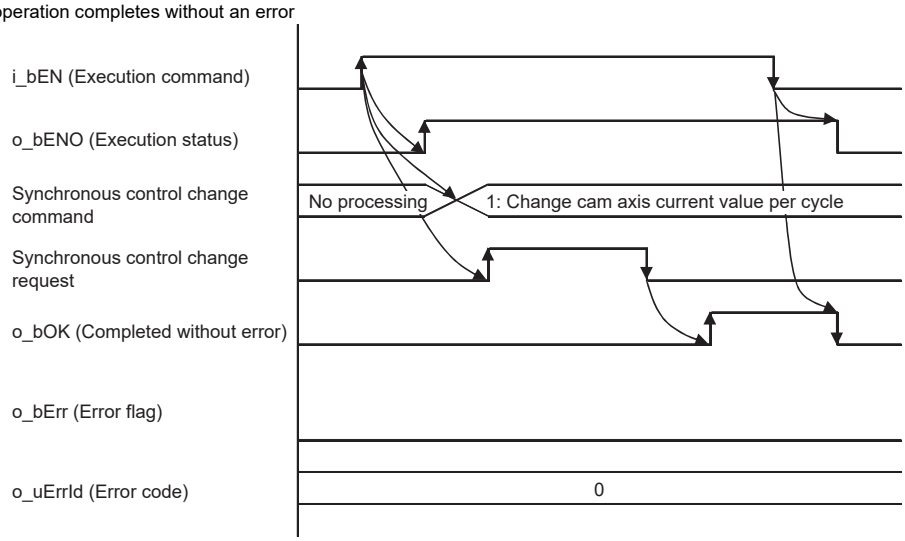
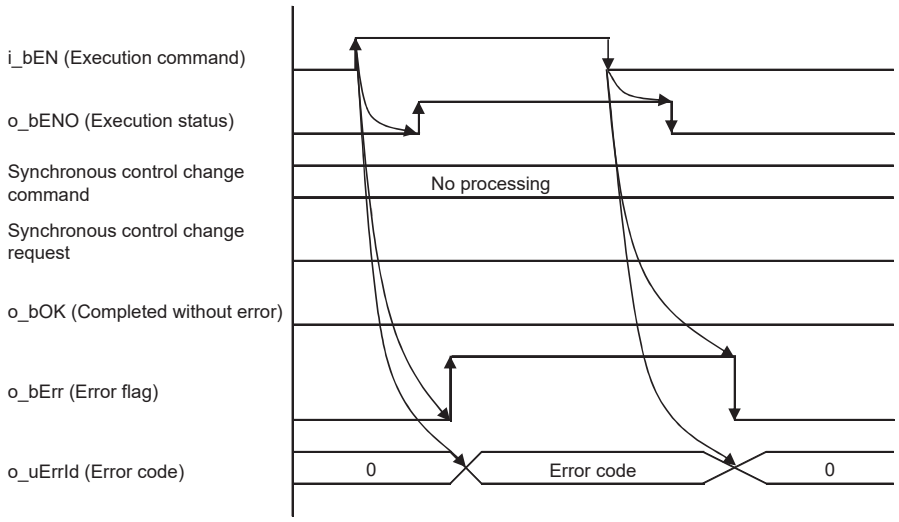


## Name

M+RD77_ChangeCamPositionPerCycle

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the cam axis current value per cycle to a synchronous control change value. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 213 steps | |
| Function description | • By turning ON i_bEN (Execution command), the cam axis current value per cycle of the output axis No. is changed.<br>• When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for an output axis No. for which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. whose cam axis current value per cycle is to be changed.<br>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.<br>The setting value is converted within the range from 0 to (Cam axis length per cycle - 1). |

### ■Output labels

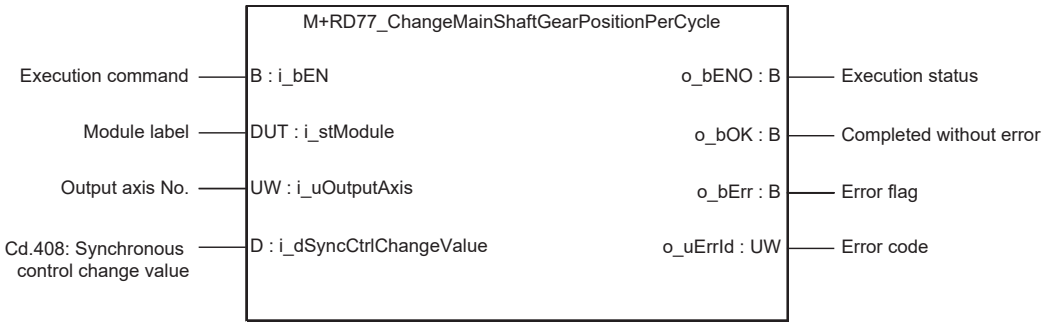
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that changing the cam axis 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_Id | Word [unsigned] | 0 | The error code generated in the FB is stored. |

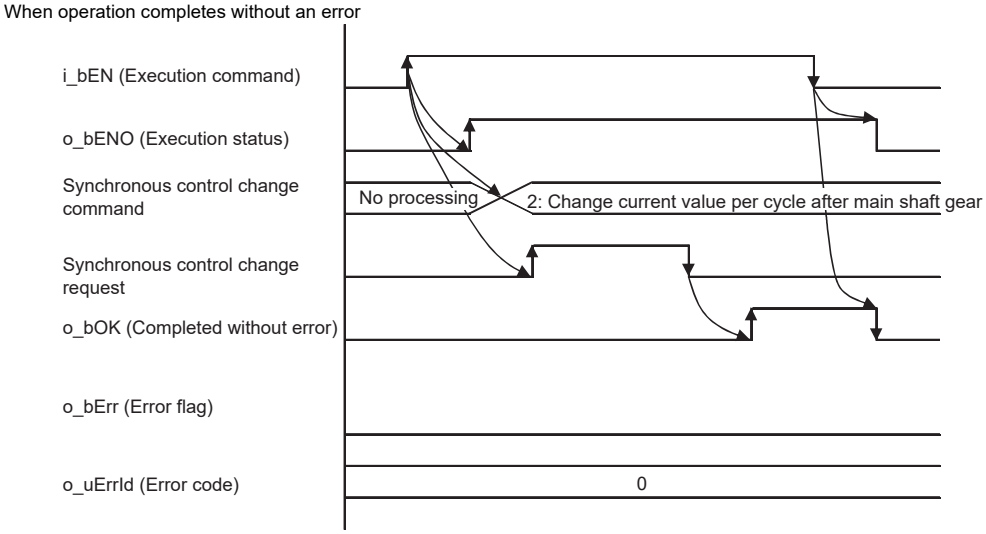
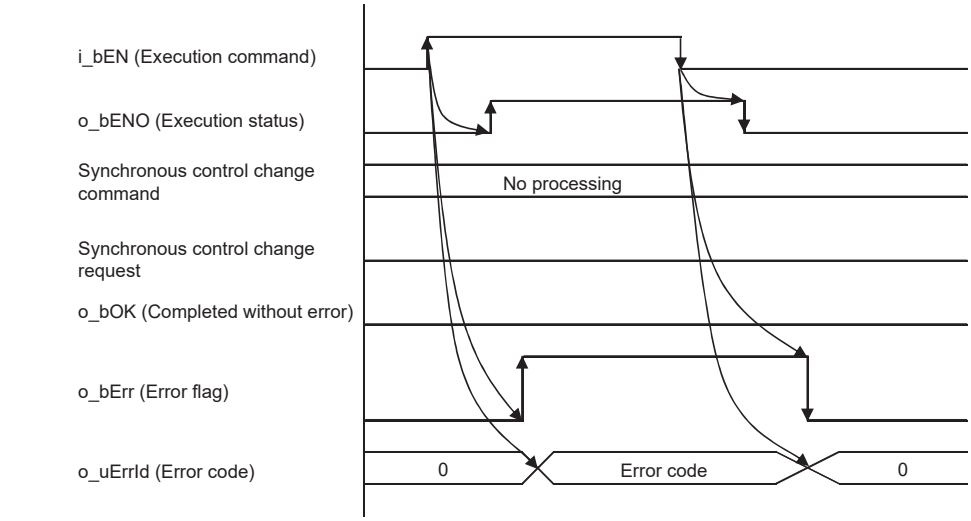
# 2.25 M+RD77_ChangeMainShaftGearPositionPerCycle

## Name

M+RD77_ChangeMainShaftGearPositionPerCycle

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the current value per cycle after main shaft gear to a synchronous control change value. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 213 steps | |
| Function description | • By turning ON i_bEN (Execution command), the current value per cycle after main shaft gear of the output axis No. is changed.<br>• When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for an output axis No. for which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. whose current value per cycle after main shaft gear is to be changed.<br>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.<br>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.<br>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. |

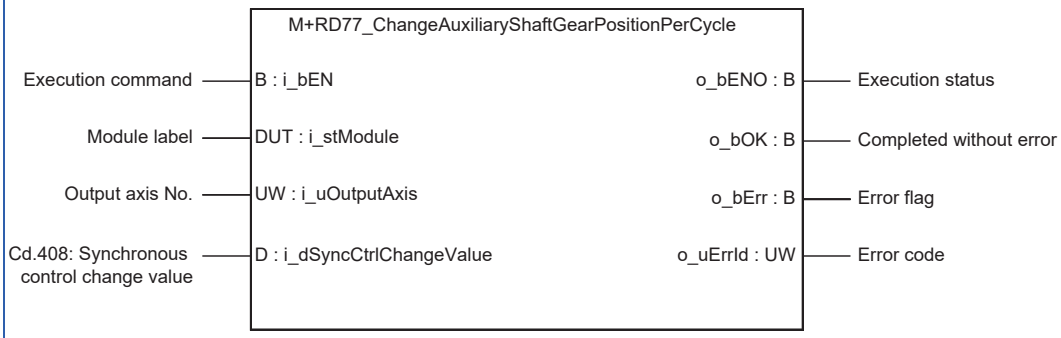
# 2.26 M+RD77_ChangeAuxiliaryShaftGearPositionPerCycle

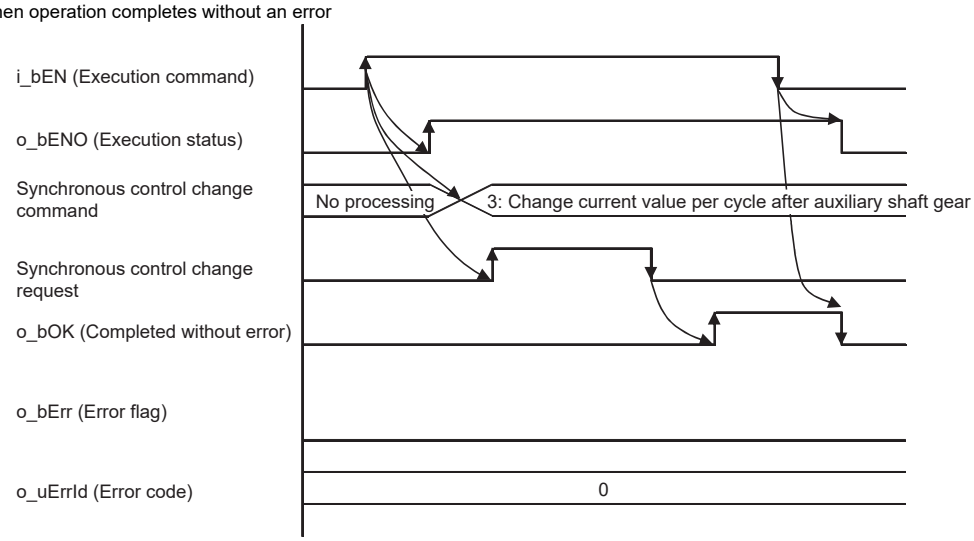
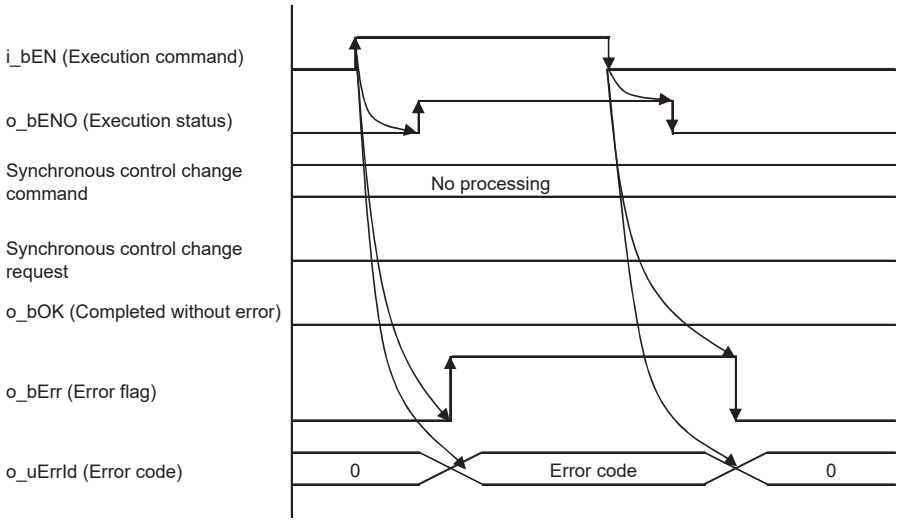


## Name

M+RD77_ChangeAuxiliaryShaftGearPositionPerCycle

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Changes the current value per cycle after auxiliary shaft gear to a synchronous control change value. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 213 steps | |
| Function description | • By turning ON i_bEN (Execution command), the current value per cycle after auxiliary shaft gear of the output axis No. is changed.<br>• When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for an output axis No. for which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. whose current value per cycle after auxiliary shaft gear is to be changed.<br>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.<br>The setting value is converted within the range from 0 to (Cam axis length per cycle - 1). |

### ■Output labels

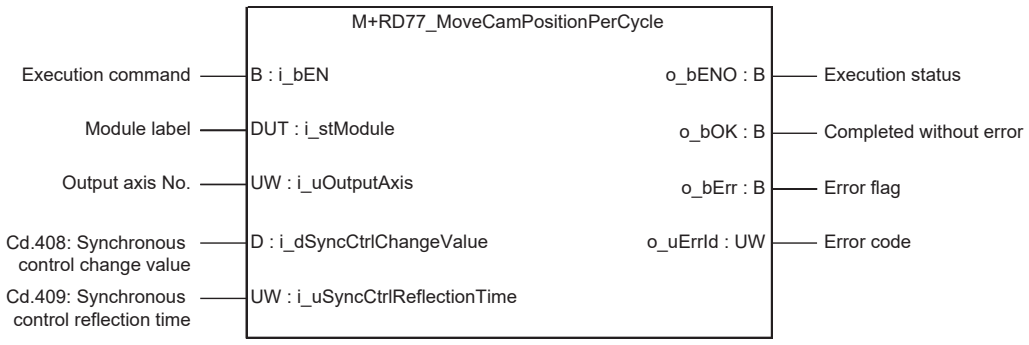
| Name | Variable name | Data type | Default value | Description |
|---|---|---|---|---|
| Execution status | o_bENO | Bit | OFF | ON: The execution command is ON.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that changing the current value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

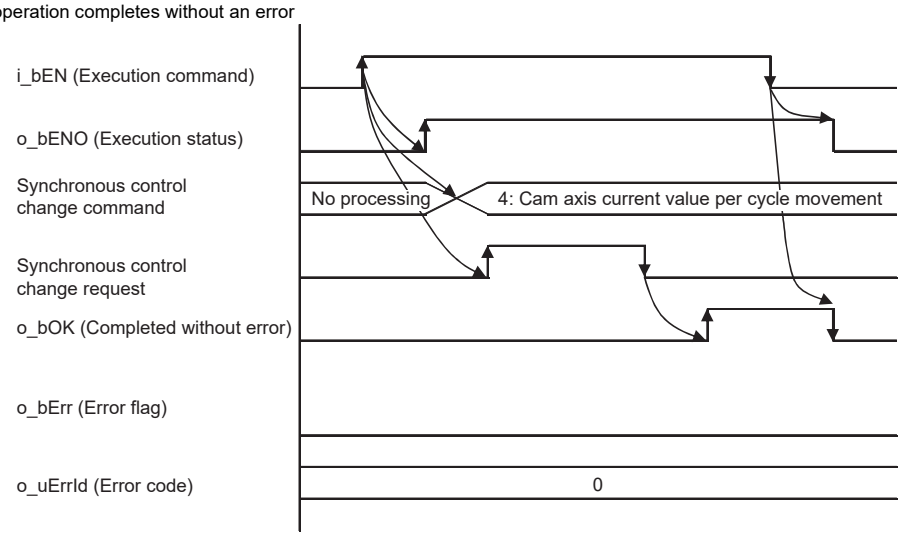
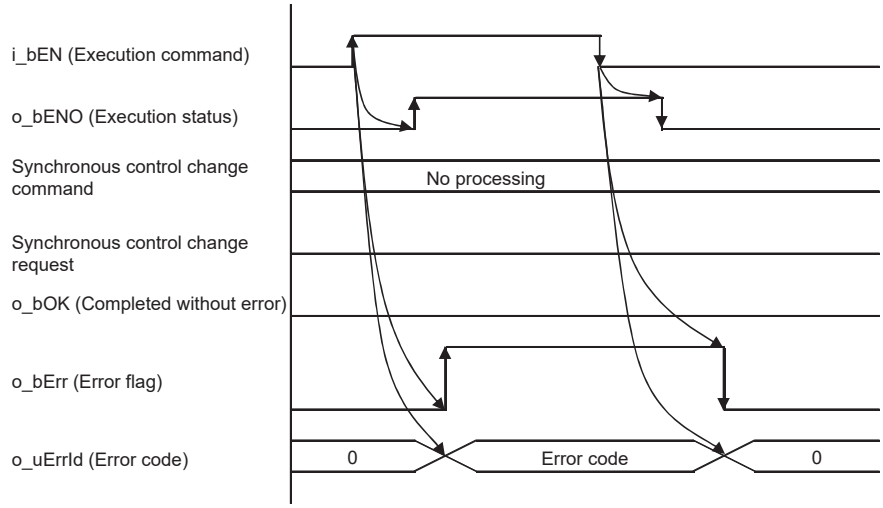
# 2.27 M+RD77_MoveCamPositionPerCycle

## Name

M+RD77_MoveCamPositionPerCycle

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Adds the movement amount set in the synchronous control change value to a cam axis current value per cycle to move the cam axis current value per cycle. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | Applicable CPU | MELSEC iQ-R series |
| | Applicable engineering software | GX Works3 |
| Programming language | Ladder | |
| Number of steps (maximum) | 355 steps | |
| Function description | • By turning ON i_bEN (Execution command), the cam axis current value per cycle of the output axis No. is moved.<br>• 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.<br>• When the setting value of the output axis No. is out of the range, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 100 (Hexadecimal) is stored in o_uErrId (Error code).<br>• When this FB is executed for an output axis No. for which synchronous control is not executed, o_bErr (Error flag) turns ON, the FB processing is interrupted, and the error code 300 (Hexadecimal) is stored in o_uErrId (Error code). | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |

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

## Error codes

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

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. whose cam axis current value per cycle is to be moved.<br>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 axis current value per cycle movement. |
| Cd.409: Synchronous control reflection time | i_uSyncCtrlReflectionTime | Word [unsigned] | 0 to 65535 (ms)<br>(0 to 32767: Set by decimal number.<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that moving the cam axis current value per cycle has been completed. |
| Error flag | o_bErr | Bit | OFF | When ON, it indicates that an error has occurred in the FB. |
| Error code | o_uErrId | Word [unsigned] | 0 | The error code generated in the FB is stored. |

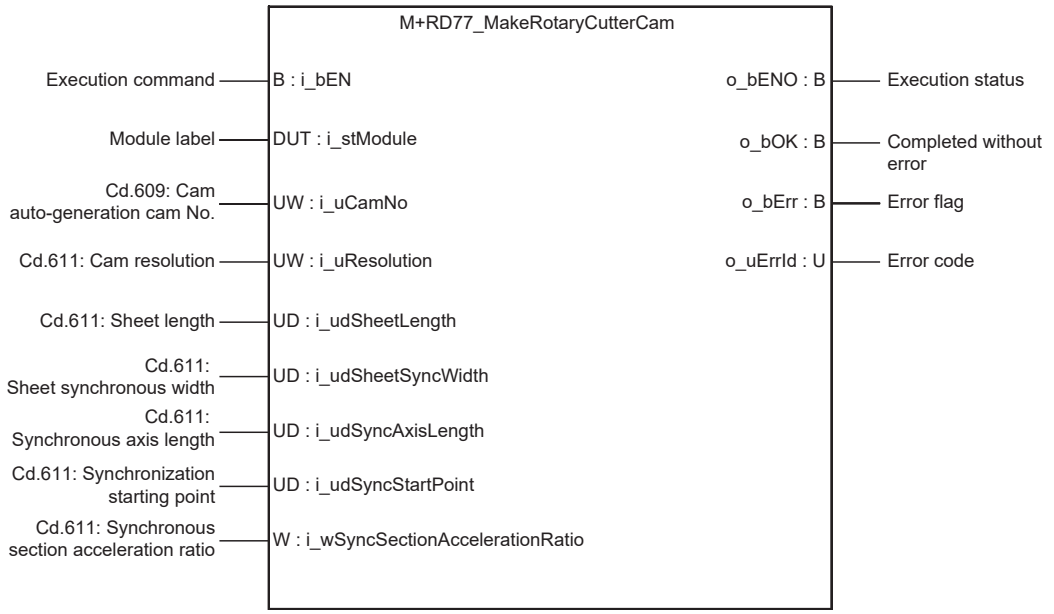
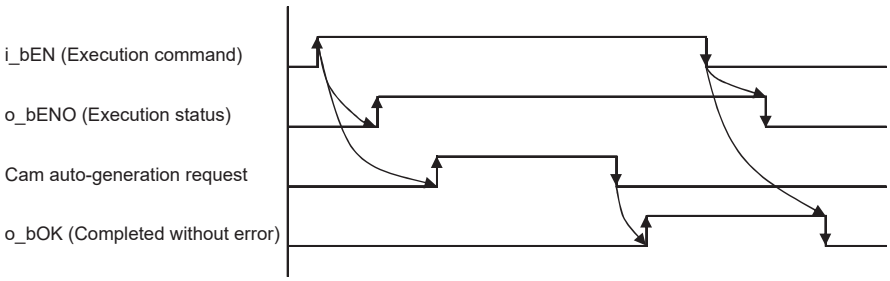
# 2.28 M+RD77_MakeRotaryCutterCam

## Name

M+RD77_MakeRotaryCutterCam



## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Automatically generates the cam for a rotary cutter. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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 command), the cam for a rotary cutter is automatically generated. | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |
| Timing chart |  | |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• Even if a warning occurs in the execution of this FB, o_bOK (Completed without error) turns ON.<br>• The FB cannot be used in an interrupt program.<br>• Every input must be provided with a value for proper FB operation. | |

## Error codes

| Error code | Description | Action |
|---|---|---|
| None | None | None |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 No. 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.<br>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_wSyncSectionAccelerationRatio | Word [signed] | -5000 to 5000 [0.01%] | Set this label when the synchronous speed in the synchronous section needs to be adjusted.<br>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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that the cam automatic generation has been completed. |
| Error flag | o_bErr | Bit | OFF | Always OFF |
| Error code | o_uErrId | Word [unsigned] | 0 | Always 0 |

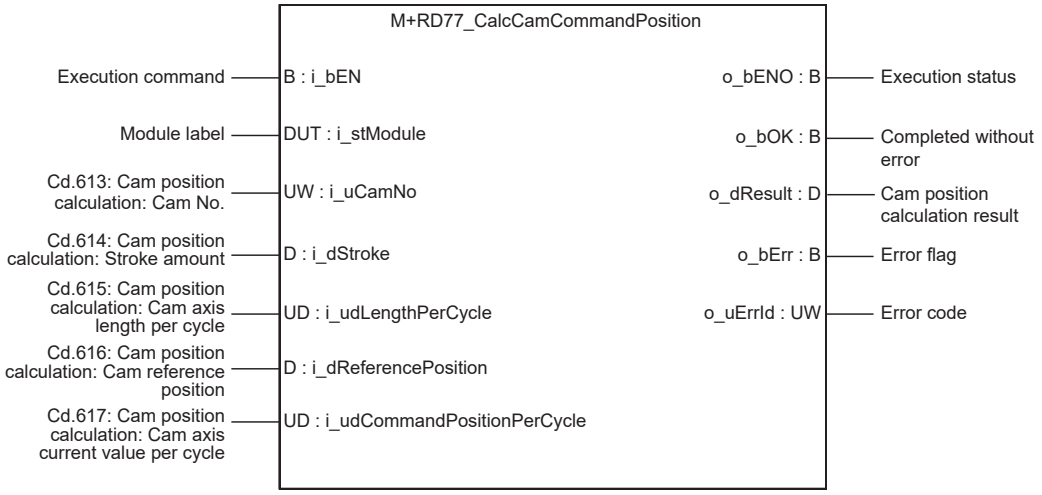
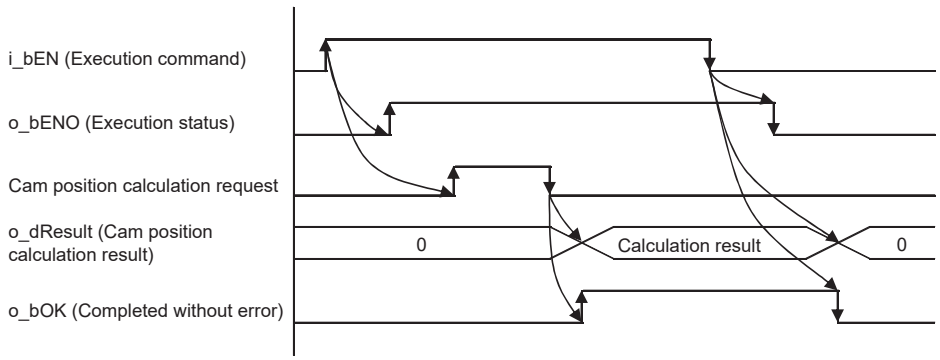
# 2.29 M+RD77_CalcCamCommandPosition



## Name

M+RD77_CalcCamCommandPosition

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Calculates a cam axis feed current value, and outputs the calculation result. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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 command), the cam axis feed current value is calculated. | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |
| Timing chart |  | |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• Even if a warning occurs in the execution of this FB, o_bOK (Completed without error) turns ON.<br>• The FB cannot be used in an interrupt program.<br>• Every input must be provided with a value for proper FB operation. | |

## Error codes

| Error code | Description | Action |
|---|---|---|
| None | None | None |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 position calculation: Cam No. | i_uCamNo | Word [unsigned] | 0 to 256 | Set the cam No. used for the calculation cam. |
| Cd.614: Cam position calculation: Stroke amount | i_dStroke | Double word [signed] | -2147483648 to 2147483647 | Set the cam stroke amount used for the cam position calculation. |
| Cd.615: Cam position calculation: Cam axis length per cycle | i_udLengthPerCycle | Double word [unsigned] | 1 to 2147483647 | Set the cam axis length per cycle used for the cam position calculation. |
| Cd.616: Cam position calculation: Cam reference position | i_dReferencePosition | Double word [signed] | -2147483648 to 2147483647 | Set the cam reference position used for the cam position calculation. |
| Cd.617: Cam position calculation: 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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that calculating the cam axis feed current value has been completed. |
| Cam position calculation result | o_dResult | Double word [signed] | 0 | The result of the cam axis feed current value calculation is stored. |
| Error flag | o_bErr | Bit | OFF | Always OFF |
| Error code | o_uErrId | Word [unsigned] | 0 | Always 0 |

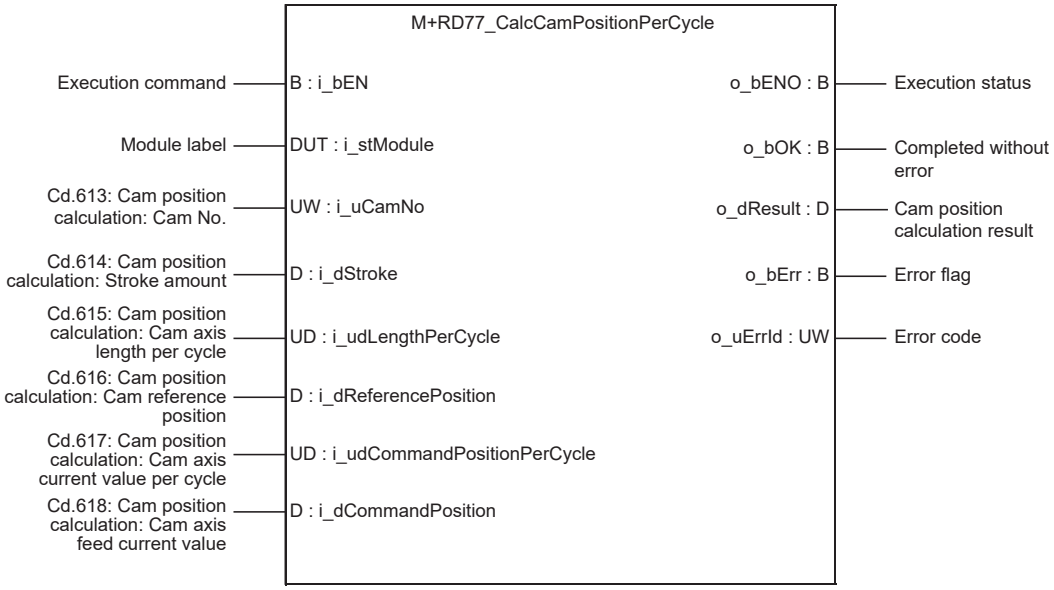
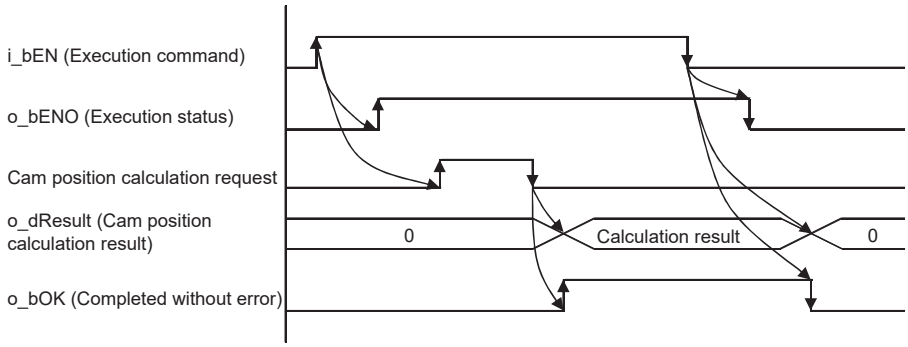
# 2.30 M+RD77_CalcCamPositionPerCycle



## Name

M+RD77_CalcCamPositionPerCycle

## Function overview

| Item | Description | |
|---|---|---|
| Function overview | Calculates a cam axis current value per cycle, and outputs the calculation result. | |
| Symbol |  | |
| Applicable hardware and software | Applicable module | RD77MS16, RD77MS8, RD77MS4, RD77MS2 |
| | 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 command), the cam axis current value per cycle is calculated. | |
| Compiling method | Macro type | |
| FB operation type | Pulsed execution (multiple scan execution type) | |
| Timing chart |  | |
| Restrictions and precautions | • The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.<br>• Even if a warning occurs in the execution of this FB, o_bOK (Completed without error) turns ON.<br>• The FB cannot be used in an interrupt program.<br>• Every input must be provided with a value for proper FB operation. | |

## Error codes

| Error code | Description | Action |
|---|---|---|
| None | None | None |

## Labels

### ■Input labels

| Name | Variable name | Data type | Setting range | Description |
|---|---|---|---|---|
| Execution command | i_bEN | Bit | ON, OFF | ON: The FB is activated.<br>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 position calculation: Cam No. | i_uCamNo | Word [unsigned] | 0 to 256 | Set the cam No. used for the calculation cam. |
| Cd.614: Cam position calculation: Stroke amount | i_dStroke | Double word [signed] | -2147483648 to 2147483647 | Set the cam stroke amount used for the cam position calculation. |
| Cd.615: Cam position calculation: Cam axis length per cycle | i_udLengthPerCycle | Double word [unsigned] | 1 to 2147483647 | Set the cam axis length per cycle used for the cam position calculation. |
| Cd.616: Cam position calculation: Cam reference position | i_dReferencePosition | Double word [signed] | -2147483648 to 2147483647 | Set the cam reference position used for the cam position calculation. |
| Cd.617: Cam position calculation: 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 position calculation: 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.<br>OFF: The execution command is OFF. |
| Completed without error | o_bOK | Bit | OFF | When ON, it indicates that calculating the cam axis current value per cycle has been completed. |
| Cam position calculation result | o_dResult | Double word [signed] | 0 | The result of the cam axis current value per cycle calculation is stored. |
| Error flag | o_bErr | Bit | OFF | Always OFF |
| Error code | o_uErrId | Word [unsigned] | 0 | Always 0 |

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# REVISIONS

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

| Revision date | *Manual number | Description |
|---|---|---|
| June 2014 | BCN-B62005-691ENG-A | First edition |
| August 2014 | BCN-B62005-691ENG-B | Partial correction |
| May 2018 | BCN-B62005-691ENG-C | Partial correction |
| July 2022 | BCN-B62005-691ENG-D | Partial correction |

Japanese manual number: BCN-B62005-690-D

BCN-B62005-691ENG-D(2207)MEE

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